Synopsis and Reclassification of the Ichneumoninae Stenopneusticae of Africa south of the Sahara (Hymenoptera)

Volume I.

Introduction; Key to Tribes and Subtribes of Ichneumoninae Stenopneusticae; Synopsis of the Protichneumonini, Ceratojoppini, Ischnojoppini, Trogini

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Synopsis and Reclassification of the Ichneumoninae Stenopneusticae of Africa South of the Sahara

Volume I.

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Introduction

During the decade between 1954 and 1964 I was entrusted with the carrying out of three scientific expeditions into the interior of tropical Africa, the first two to Angola, the last one to Tanganyika. Although ornithological, and not entomological, research was the main purpose of all these enterprises, they were, nevertheless, also of fundamental importance for the origin of this Synopsis, as they offered an excellent opportunity to become thoroughly acquainted with the zoogeographical pattern of the Ethiopian Region and its ecological diversity. After my return from the second Angola-expedition I decided to utilize the experience gathered in the field, as well as the material occasionally collected for a monographic treatment of the Ichneumoninae of Angola.

As a third expedition to Angola was planned for the year 1960, I intended to supplement the collection first and begin the work on the monograph later. The project was accepted and sponsored by Yale University, and financed by a grant from the National Science Foundation. However, when in the spring of 1961, the third Angola expedition (Yale University) was ready to start, Angola was suddenly shaken by severe and bloody political disturbances. The expedition therefore had to be diverted to another part of Africa, and Tanganyika was chosen. With regard to my entomological aim, this event meant the abolition of the original, geographically limited Angola monograph. Simultaneously it opened the gate to a new conception of a comprehensive, critical synopsis of the Ichneumoninae of entire Africa, south of the Sahara, as will be presented by this publication.

The principal aim of this paper is the taxonomic synthesis of all species of the Ichneumoninae stenopneusticae described until the end of 1964 from Africa (south of the Sahara), including Madagascar and the Seychelles. All material collected during my expeditions to Angola and Tanganyika, and during a subsequent trip to South Africa, will be incorporated as well as the African material of the subfamily kept at the present time in the Museum of Cape Town, Bulawayo, Berlin and Genoa. Also included is a small collection of interesting species gathered by Mr. C. Jacot-Guillarmod in Basutoland, and a few selected species from the Musée National d'Histoire Naturelle in Paris and from the British Museum. The unarranged material from the Congo kept in Tervuren and in Brussels is so vast, that its incorporation would have delayed the completion of this work very considerably, a risk which I did not feel able to take.

It should therefore be realized that the inventory of species of Africa as presented in this monograph is far from complete. I suppose that of the species occuring in Angola, Tanganyika and South Africa more than 50% may be covered. For the rest of Africa south of the Sahara it will probably be much less than that. Before all these gaps are filled, no key will be complete and likely to work with perfection. I hope, however, that my monograph will improve the present deplorably chaotic status of the taxonomy of African Ichneumoninae essentially and that it will create the new foundation which is indispensible for every attempt at further progress in this field. Lastly, I wish to repeat what I mentioned in the introduction to my Nearctic Monograph: „All I could do, is open the gates. Behind them lies a wide-open field still waiting for further research."

Acknowledgment

The basic research for this monograph, particularly the studies of the insects in their habitat, and the examination of types in Europe as well as in South Africa, was supported and made possible by two grants of the National Science Foundation (G—8786 and GB—2956). I wish to express my sincere gratitude to this institution.

The most difficult part in the completion of this monograph was the solution of the problem of its publication in a way which I could accept as proper and adequate to its nature and purpose. In this regard I feel deeply indebted to the Farmington State College, Farmington, Maine, in particular to Dr. E. H. Scott, President of the college, and to Dr. John E. Mudge, Chairman, Science Department, for sponsoring my cause and for taking upon themselves all responsibilities and work connected with the achieving of the publication.

Decisive for the publication was the financial support granted for this purpose by the National Science Foundation, Office of Science Information Service, to whom I wish to express my appreciation and gratitude.

I am also indebted to Dr. W. Forster, Staatssammlung in Munich, for his support of my work by freeing Mr. E. Diller from his official duties, on behalf of the artistic needs of the monograph, and for his aid in the search for a publisher.

I have been greatly aided in my work by many individuals, in particular by the curators of all museums I visited for studies of types and material. The kind assistance of most of these persons went far beyond the limits of their professional obligations. They all may be assured of my sincere appreciation. In particular I express my gratitude to Miss Luella Walkley of the Smithsonian Institution in Washington, who assisted with the loan of a card-file of Ichneumoninae with bibliographic notes, to Dr. E. Königsmann of the Zoologisches Museum der Humboldt Universität in East Berlin, to Mr. J. Oehlke of the Deutsches Entomologisches Institut in Berlin-Friedrichshagen, to Professor Jean Leclercq, Jupile, Belgium, to Dottoressa Delfa Guiglia of the Museo Civico di Storia Naturale in Genova, to Dr. J. F. Perkins of the British Museum in London, to Dr. Franz Bachmaier of the Zoologische Sammlung des Bayerischen Staates in Muenchen, to Mlle. S. Kelner-Pillault of the Musée National d'Histoire Naturelle in Paris, to Dr. Jacques F. Aubert of the Faculté des Sciences de Paris, to Dr. Karl Johann Hedquist and Dr. Eric Kjellander of the Naturhistoriska Riksmuseet in Stock-

holm, to Dr. I. Nast and Mgr. B. Pisarski, both of the Polska Akademia Nauk in Warszawa, to Dr. A. I. Hesse of the South African Museum in Cape Town, to Mr. B. R. Stuckenberg of the Natal Museum in Pietermaritzburg, to Mr. C. Jacot Guillarmod who gave me a fine collection of Ichneumoninae from Basutoland, and Mr. F. L. Farquharson, who, during my stay in Grahamstown, was my mentor and successful collecting assistant on several excursions in this area, both of the Albany Museum in Grahamstown, to Dr. I. C. G. Pinhey of the National Museum in Bulawayo.

The drawings were made by Mr. Erich Diller, artist of the Zoologische Sammlung des Bayerischen Staates, in Munich, Germany. I wish to express my appreciation of his excellent work. I am also bound in gratitude to Dr. H. Pearson Hopper, Washington, for reading and linguistically improving my manuscript, to my wife, Mrs. Hildegarde M. Heinrich who took part in the three African expeditions and assisted in collecting, and by preparing the typescript of this work, and to my son, Bernd Heinrich who gathered in Tanganyika a valuable collection of Ichneumoninae — in some instances under difficult or unpleasant circumstances.

Review of Literature

References in this paper will generally be confined to the original descriptions. Occasionally further references may be added, as far as they are considered important taxonomically or otherwise interesting. To compile a complete bibliography has not been my aim in the preparation of this publication.

The literature pertaining to African Ichneumoninae begins with Linnaeus who named *Ichneumon bicolorus* in 1767. Fourteen years later Fabricius described a second African species and in 1822 Thunberg added 4 species to the annals of the Ethiopian Fauna. Until close to the end of the 19th century only a modest number of new names, mainly by Holmgren, Saussure and Brullé, appeared in the literature. With 1896 began a tide of descriptive activity which extended over a period of 30 years. During this time Tosquinet named 59 new species, Cameron 39, Szépligeti 35, and Morley 108. All these species were assigned practically at random to a number of Palaearctic and Oriental genera. A few examples will verify my statement: 17 species described from Africa as *Platylabus* by Cameron and Morley belong to 8 distinct genera, but not a single species is a genuine *Platylabus* or even belongs to the tribe Platylabini. Among 21 species described from Sjoestedt's Kilimandjaro—Meru expedition by Szépligeti and placed in *Hoplismenus* Gravenhorst I did not find a single representative of that genus, but at least 7 other distinct, unrelated genera, one of which was of another subfamily, were represented. At the specific level the situation was scarcely better than at the generic. For example. the oldest Ethiopian species, *Ichneumon bicolorus* Linnaeus, was renamed five times as „new" before 1846, twice by Thunberg, twice by Brullé and once by Fabricius. So we see that the flood of descriptions mentioned above has done little to clear and advance our knowledge of African Ichneumoninae, but instead has left their taxonomy in a state of confusion which is close to chaos. I believe, that the decrease of new descriptions, following the high tide of descriptive activities of 1896—1926, was partially due to the fact that later

authors realized it was impossible to continue along the old line before the species named were properly correlated and critically arranged.

The only comprehensive work done on African Ichneumoninae after 1926 was my monograph on the Ichneumoninae of Madagascar. This was based upon an excellent and representative collection of more than 5000 specimens given to me by my friend André Seyrig, who lived in Madagascar and was later assassinated there during the Second World War.

Terminology

Antennae.—The first segment of the antenna, the *scape,* is of minor taxonomic value and will be mentioned only with reference to its color. Of greatest importance, particularly for the specific distinction of the females, is the flagellum. Two main types of female flagellum are distinguished: the *bristle-shaped* type which tapers considerably toward the apex, or is strongly attenuated at the end, and the *filiform* type with nonetapering, blunt apex. Intermediate forms occur and will be described as such. The term *bristle-shaped* will be used for any flagellum with attenuated apex, regardless of whether the flagellum is slender or thick. Bristle-shaped flagella that are particularly strongly widened beyond middle and then very sharply attenuated toward apex may also be described as *lanceolate.* The first segment of the flagellum is almost always the longest, the following segments usually being successively more and more abbreviated until a segment of equal length and width is reached. The basal segments are usually not exactly cylindrical but slightly compressed laterally. The relation of their length and width is therefore different in dorsal and lateral view. In this paper the short descriptive phrase *"fifth segment square"* will mean that, in lateral view, the fifth segment of the flagellum (counting from the base) is the first which appears to be approximately as long as apically wide. It should, however, be understood that this character is estimated and therefore only approximate, and that the proportions of length to width of the flagellar segments are slightly altered as soon as the flagellum is bent. In the females of some Ethiopian species, particularly of the genus *Leptophatnus* Cameron, the flagellum is dorsally more or less depressed and flattened in the section of the white annulus (about its median part) to shortly before the beginning of the regular dilatation and ventral flat. On such flagella the recognizing of the first square segment is especially difficult and the result is never quite reliable, as by the dorsal depression of the flagellum the optical conception of the diameter of segments, in lateral view, will be altered considerably by every slight turn of the object. In such cases therefore the first square segment is usually not recorded in the descriptions.

Beyond the middle, the flagellum of females, in the majority of species, is ventrally flattened and more or less widened. The degree of this dilatation is of great importance for the distinction of species. It will be described as the proportion of the median length of the widest segment to its width, to be seen on the flat, ventral side of flagellum. The description *„widest segment three times as wide as long"* thus means that, seen from the flattened side, the widest of the flagellar segments is three times as wide as medially long when measured from one lateral edge of the flat part to the other.

The *number of flagellar segments* too, is significant for the diagnosis of a species, although one has to consider it a rule that large individuals may have a few more segments than small ones of the same species. In the following descriptions the number of flagellar segments of each species will be recorded, either of the type specimen only, or the minimal and maximal number when a series of specimens has been examined. These numbers refer always to the flagellum only and do not include the scape and pedicel.

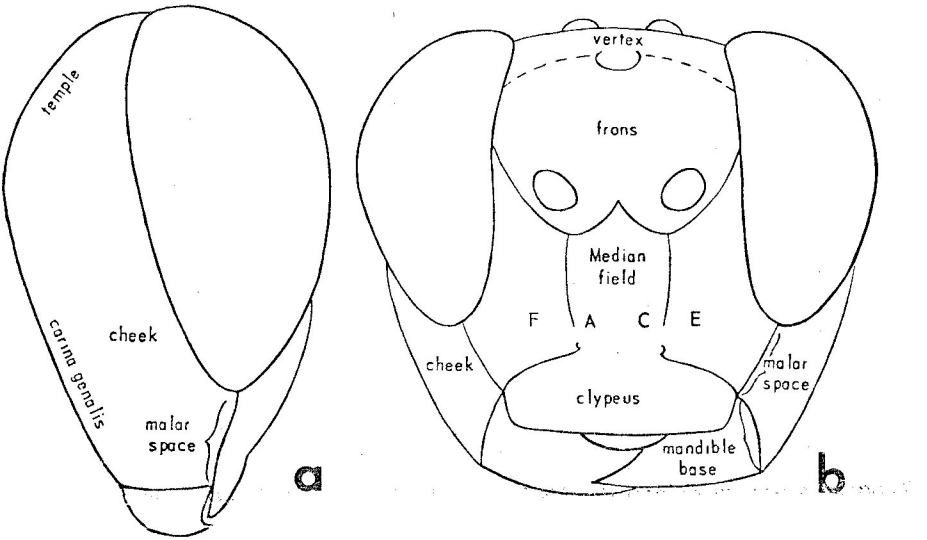
The structure of the *flagellum of males* is quite different from that of females, and shows, as a rule, less interspecific differentiation. There are, however, a few special characters of diagnostic value. One of these is the *tyloids* which are raised areas varying sometimes specifically in shape, size or number, or are, in a few cases, entirely absent.

The flagella of a number of males of the subtribe Apatetorina, particularly of the genus *Leptophatnus* Cameron (except its type species), display peculiar structures of unknown function which vary specifically in size and shape, and which may therefore be of taxonomic value. For these structures I have used *sigilla*, a new term. They appear as a row of completely flat, hairless impressions with usually sharply defined outlines. Each sigillum is situated on the basal part of a flagellar segment and extends a variable distance toward the segment's apex, simultaneously overlapping slightly the very apex of the preceding segment. There is usually one row of sigilla on the ventral side of the flagellum beginning near its base, and another row on the dorsal side beginning before its middle, both rows becoming confluent on the short segments near the apex of flagellum. In some species the ventral row of sigilla may be fairly distinct, while the dorsal row is obsolete.

Note: Throughout this paper, descriptive notes refering to the *scape* will be included in the paragraph *„flagellum"*.

Head.—The *orbit* is a narrow area on the head adjacent to the eye and all around it. The orbit is divisible into several parts named according to their situation. *Frons* is the part of the head above the supra-antennal cavities and up to the lower ocellus including the level of the latter. By *vertex* I mean the top part of the head, adjacent to the frons and extending back to the edge of the posterior declivity, or occiput. *Temple* refers to the area between approximately the upper fifth of the hind margin of the eye and the *occipital carina*. *Malar space* is used for the shortest distance from the lower margin of the eye to the anterior (upper) corner of the mandible. It will be given in relation to the width of the mandible measured at its base. The *carina oralis* is situated on the posterior part of the head and borders the opening of the mouth-parts. *Carina genalis* refers to the lower part of the occipital carina and borders the cheek area. *Cheek* applies to the region limited by the malar space, the carina genalis and the temple region.

Cheek profile means the outline of the cheeks seen in front view; *temple profile* the outline of the temples seen directly from above. The carina genalis and carina oralis meet usually shortly before the hind (lower) corner of the mandible. The spot where both carinae join is called the *carinal junction*, the carinal section between the junction and the mandible base is called the *abscissula*. The adjective *"vertical"*, if used in the



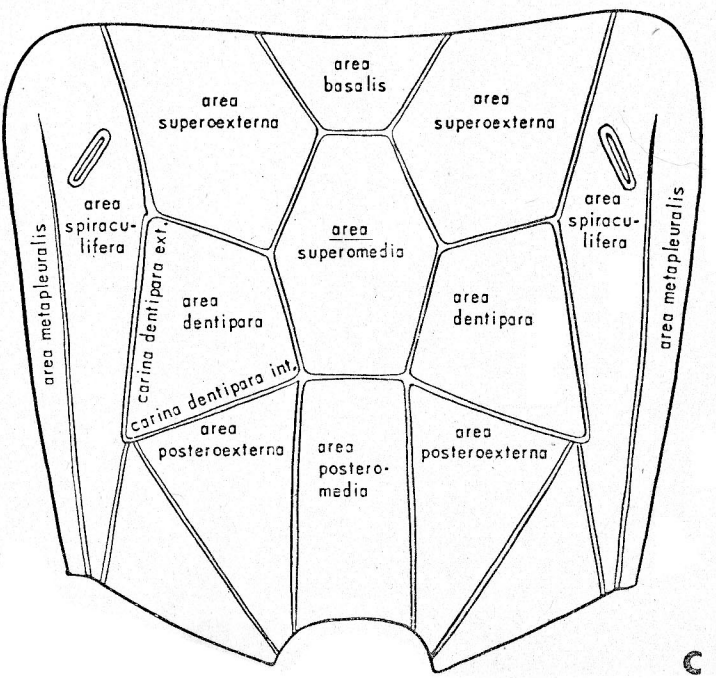
Figs. a and b: Morphology of head.

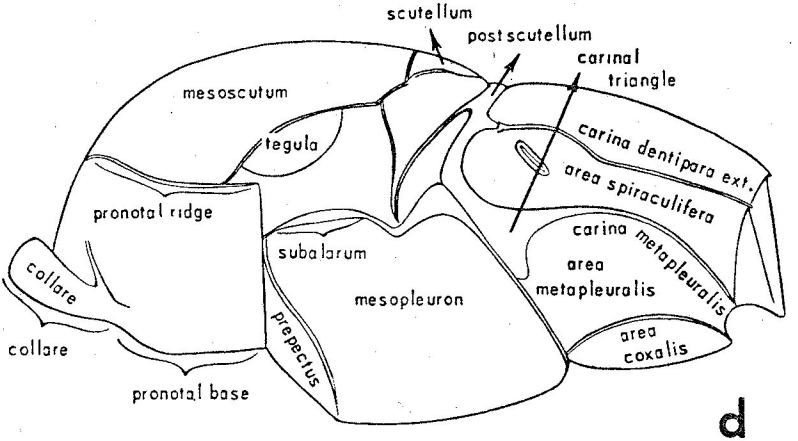
descriptions of the chromatic characters of the head, particularly of the color of orbits, refers to the vertex (for example *"vertical marks"* = marks on the orbits of the vertex).

Thorax.—The *collare* is the elevated, collar-like, anterior, median part of the pronotum, covering the soft tissue connecting head and thorax. The upper and lower border of the pronotum will frequently be mentioned as areas often bearing a light color pattern. I refer to the upper margin of the pronotum as *pronotal ridge*, to the lower border of the pronotum as *pronotal base*. The longitudinal furrows of the mesoscutum will be termed *notauli*. They are usually subobsolete to obsolete in the Ichneumoninae, and more or less distinctly indicated only at the base, close to the anterior border of the mesoscutum. In some cases, however, they may be fairly distinct, maximally to about the length of the anterior third of the mesoscutum; they are extraordinarily well developed and extremely long in the strange, Ethiopian genus *Ceratojoppa* Cameron and in the genus *Ctenocalops* Heinrich of the tribe Ctenocalini. The notauli (or the lines where they would be if present) divide the mesoscutum into a *median* and two *lateral lobes*. In several African genera the median lobe is anteriorly elevated and slightly to very distinctly bipartite. For the protruding ridge on the anterior part of the upper border of the mesopleuron which supports the base of the wings I use the name *subalarum*. *Mesosulcus* (in this paper the terms mesosulcus and *mesolcus* are equal) is the median, longitudinal furrow of the mesosternum. The *sternauli* of the Ichneumoninae do not extend on the mesopleura as they usually do in the Cryptinae, but are often basally impressed on the mesosternum. *Prosternum* is the plate beneath the pronotal base and covering the ventral side of the prothorax backwards to the front coxae. The smooth, vertical frontal plane of the mesothorax (behind the front coxae) is the *prepectus*. The propo-

deum is treated as a part of the thorax. Its upper surface, including the *area basalis,* the *area superomedia,* the two *areae superoexternae* and the two *areae dentiparae,* is termed the *horizontal part of the propodeum.* The horizontal part is bordered laterally by the *carinae dentiparae exteriores* and apically by the *carinae dentiparae interiores.* The lateral parts of the propodeum sloping down from carinae dentiparae exteriores to the hind coxae are the *metapleura.* They are divided by the *carinae metapleurales* into the *area spiraculifera* bearing the spiracles of the propodeum above, and the large *area metapleuralis* below each carina metapleuralis. The area metapleuralis is usually separated from another small field above the hind coxa, the *area coxalis.* At the place where the carina metapleuralis meets the posterior border of the mesopleuron the carina is widened into a triangular shape, the *carinal triangle.* The *apical part of the propodeum* includes the *area posteromedia* in the middle and the two areae posteroexternae at the sides. Of taxonomic importance is the ratio of the length of the horizontal part of the propodeum to the length of its apical part. These two lengths are measured along the mid-dorsal line: the area basalis plus the area superomedia for the horizontal part, the area posteromedia for the apical part. In some African genera the area superomedia is united with the area basalis, forming one large, median area adjacent to postscutellum, which will be called *central area* or *area centralis.*

Abdomen.—The dorsal segments of the abdomen, the visible tergites one to seven, are designated by Arabic numerals. The narrow basal part of tergite one is the *petiole,* the widened apical part the *postpetiole.* The median part of the postpetiole is often somewhat raised and laterally bor-





Figs. c and d: Morphology of propodeum and morphology of thorax

dered by sharp edges, thus forming a distinct *median field*, the sculpture of which is usually different from the sculpture of the two *lateral fields*. The sculpture of the median field has taxonomic significance and may be longitudinally *striated*, irregularly *reticulated*, *rugose*, *punctured*, or *smooth*. The impressions at both sides of the base of tergite two are the *gastrocoeli*. The transverse, smooth declivities sloping down from the hind margin of the gastrocoeli towards the impression are called *thyridia*. The thyridia may be absent even though the gastrocoeli are distinctly impressed (e. g., *Macrophatnus* Cameron) or present as a narrow, smooth, nearly translucent, transverse band in cases where the geastrocoeli are obsolete. Both gastrocoeli and thyridia are sometimes widened to such an extent that the space between them is distinctly narrower than one of them, or even reduced to a narrow bridge. The ventral segments of the abdomen are the *sternites*. The last sternite, the *hypopygium*, shows considerable variation in length in the females, and in shape and length in the males. If a female hypopygium is prolonged so that it covers the entire, or nearly the entire, slit for the ovipositor, the abdomen is called *amblypygous*, if not, *oxypygous*.

Wings.—In the Ichneumoninae characters of wing venation show very little specific variation. Only the small, normally pentagonal cell in the forewing, the *areola*, occasionally shows differentiations of distinctive value.

Legs.—The three pairs of legs, or their parts, will be referred to by Roman numerals: I, stands for the anterior; II, for the middle; III, for the posterior, pair of legs. The tarsal segments are designated by Arabic numerals. The first tarsal segment is the *metatarsus*. The second, short, segment of the trochanter is called the *trochantellus*. The third (hind) coxae of the female sometimes bear a ventral, brush-like patch of dense hair, the *scopa* or *scopula*. The *claws* of the anterior two pairs of legs, or of all legs, are sometimes pectinate, more often in females than in males.

Remarks

The word *apical* is used in most cases with the meaning "posterior" and the word *basal* with the meaning "anterior".

Scutella is used to designate collectively the scutellum and the postscutellum.

Anal marks refers to white or yellow marks on the posterior median part of the last, or the two or three last tergites.

Abbreviations

For quotations of literature, the customary abbreviations will be used. The names of collections studied will be abbreviated as follows:

BM — British Museum, London, England.
CGH I. — First Collection Gerd H. Heinrich, now kept in the Instytut Zoologiczny, Polska Akademia Nauk, Warsaw, Poland.
CGH II. — Second Collection Gerd H. Heinrich, in Dryden, Maine, U.S.A.
CM — Congo Museum, Tervueren, Belgium.
IRSN — Institut Royal de Science Naturelle, Brussels, Belgium.
MCHN — Museo Civico di Storia Naturale, Genoa, Italy.
MNHN — Musée National d'Histoire Naturelle, Paris, France.
MNM — Magyar Nemzeti Muzeum, Budapest, Hungary.
NR — Naturhistoriska Riksmuseet, Stockholm, Sweden.
SAM — South African Museum, Cape Town, Union of South Africa.
USNM — United States National Museum, Wshington, D.C., U.S.A.
ZMHU — Zoologisches Muesum der Humboldt Universität, Berlin, Germany.
NMB — National Museum of Southern Rhodesia, Bulawayo.

Sexual Dimorphism and Dichroism

In the Ichneumoninae the differences between the sexes are extraordinarily great in morphology as well as, sometimes, in coloration. Both kinds of differentiation have often been included in the term *sexual dimorphism*, although from an etymological point of view this is not correct — the Greek word "morpho" referring to the form only, not to the color. In this paper the term *sexual dichroism* will be used in reference to differences of the sexes in color, while the term *sexual dimorphism* will be reserved for structural differentiation.

Sexual dimorphism.—Follows nearly the same general rules and shows nearly the same degree of development in most of the tribes of Ichneumoninae, and it affects almost every part of the body. If we ask the question: "which structural features are constantly and exactly congruent in both sexes" the answer is: "practically none". The degree, however, to which each character is sexually differentiated, varies greatly. Among the morphological characters generally used in the taxonomy of Ichneumoninae, the structure of the gastrocoeli and of the mandibles varies sexually the least, the shape of flagella, scutellum, propodeum and (in certain cases only) head, the most. The *flagella* are, as generally known, entirely differently constructed in the two sexes. For example, the female flagellum is often ventrally flattened beyond middle and more or less widened, but neither of these two features ever occurs in males. The *scutellum* is usually somewhat more raised above the postscutellum in males than in females. This tendency reaches the highest degree in the tribe Compsophorini Heinrich, in particular in *Tosquinetia* Ashmead where the scutellum of females is often but moderately convex, whereas the male scutellum is pyramidal. In the genus *Epijoppa* Morley, however, the scutella of both sexes are alike (pyramidal). Both groups thus can be distinguished only in the female sex

and therefore could perhaps be regarded as synonyms. The *propodeum* is, as a rule, relatively shorter in males than in females. Its carination, however, so important for specific distinction as well as for generic, corresponds more or less in both sexes, except that the area superomedia is usually relatively shorter in males than in females. The *apophyses* of the propodeum are sometimes approximately equal in both sexes. If they are affected by sexual dimorphism, then the apophyses are shorter in males than in females. In the Ethiopian genus *Genaemirum* Heinrich the genae have developed bizzare apical appendices in females which are absent in males. In some parasites (chiefly those belonging to the tribe Ichneumonini which have specialized on cryptophagous, stem boring larvae) the head structure of females may be strengthened by more or less widened temples and cheeks. Such adaptive characters are usually much less developed in the male sex. On the other hand, a very strongly developed head structure, with extremely widened temples and cheeks, may represent a generic or a tribal feature, as in the Oedicephalini Heinrich and Compsophorini Heinrich, both well represented in the Ethiopian region and in the Oriental region as well. In these cases that head structure is alike in both sexes. The third possibility, that temples and cheeks are more swollen in males than in females, is found in several Ethiopian genera, as for example in the genus *Phaisura* Cameron. Pectinate claws are often confined to the female, as in the Ethiopian genus *Ctenocalus* Szépligeti and in *Neotypus* Foerster. Sometimes, however, they are present in both sexes, as in the genus *Ctenochares* Foerster.

Sexual dichroism.—Like dimorphism this follows certain rules. It is more or less evident in nearly all species, but considerably more developed in some groups than in others. It reaches the highest degree and is most striking in the tribe Ichneumonini, particularly in the Holarctic genera *Ichneumon* Linnaeus, *Spilichneumon* Thomson, *Triptognathus* Berthoumieu, *Ctenichneumon* Thomson and *Eutanyacra* Cameron. Only one of these genera is recorded from the tropical belt of Africa where sexual dichroism is generally not very strongly developed. In the moderate zone of South Africa, however, the Holarctic phenomenon of extreme sexual dichroism finds its counterpart. It appears most strikingly in the genus *Macrophatnus* Cameron, the females of which were described as genus *Rosella* Cameron, a group closely related to *Triptognathus* and *Ctenichneumon* of the Holarctic. On account of its sexual dichroism, accompanied by great individual variability in color and by monotonous structure and sculpture, the genus *Macrophatnus* represents, among the Ichneumoninae of Africa south of the Sahara, the most difficult, and hitherto unsolved, taxonomic problem.

One particular pattern of sexual dichroism deserves special attention: the sex differences in wing infuscation. Usually both sexes have very strong infuscation of wings in common. In some cases, however, this character differs more or less with the sex. It is always the male that displays the lesser degree of infuscation often having entirely clear wings when the females are dark-winged. In *Calleupalamus olsouffieffi* Heinrich, from Madagascar, the forewings of the females bear two strongly developed, dark crossbands, whereas in the males the main (inner) crossband seems always to be lacking. Also in the strongly dichromatic sexes of some South African species of the genera *Ichneumon* and *Macrophatnus* the females

display distinctly infuscated wings, in contrast to the clear-winged males. A typical example is the species *Ichneumon unicinctus* Brullé (= *tananarivae* Heinrich) from Madagascar.

Normal, that is moderate, sexual dichroism, as evident in nearly every species of the subfamily, shows the following general rules: white pattern on head, in particular on face, clypeus, mandibles, orbits and ventral side of scape; on thorax, in particular on collare, pronotum, subalarum, tegulae, scutella and propodeum; on legs, in particular on coxae and tarsi, tend to be more extensive in males than in females, and are sometimes even subobsolete or absent in females. In contrast herewith, white abdominal patterns, especially anal markings, are usually more restricted in males than in females. Also a white flagellar annulus, present in females, may sometimes be lacking in the males.

Regional convergency

A most perplexing and hitherto not yet satisfactorily explained phenomenon is represented by the fact, that in certain given faunistic regions a multitude of species of insects displays the same general color pattern which does not, or only infrequently, occur in other faunistic regions. This phenomenon is termed *regional convergency*. It is evident, in the first place, in related species belonging to the same tribe or the same subfamily, but it seems sometimes also to comprise even different families or orders of insects. It is perhaps most strikingly pronounced and apparent in the *Ichneumoninae* and *Cryptinae*. This convergency is so distinct that a trained eye can often recognize by the color pattern of a specimen, from which part of the world it came. Usually regional convergency is not evident only in one particular color pattern displayed by a multitude of species in the same region, but by two or three quite different colorations which occur in parallel frequency.

The main type of regional convergency in the Oriental region is represented by abundance of yellow in the color pattern, particularly in bandings and markings on the abdomen. Hundreds of Oriental species, belonging to a multitude of genera, display this coloration. In the Ethiopian region the excessively yellow spotted and banded color type is almost entirely lacking, and no other, so clearly prevailing chromatic character takes its place. Instead three unusual color types, each quite different from the others, occur frequently and in a number of different genera of the Ichneumoninae and sometimes even of the Cryptinae, not rarely two of these types being represented in the same genus. As none of these chromatic types is known from other parts of the world, they represent a threefold manifestation of true regional convergency:

a. Body predominantly black, including head, thorax, legs, with only coxae orange; wings with deeply infuscated cloud or bands. This coloration is rare but occurs in several, not closely related genera: *Calleupalamus* Heinrich (one species), *Ctenocalus* Szépligeti (one species), *Epijoppa* Morley (one species), *Fasciphatnus* new genus (one species), also occurs in the Cryptinae.
b. Predominantly dark metallic blue-black, including legs and coxae; head, or head and mesothorax, red; wings entirely infuscated, or with dark bands. This is a fairly frequent pattern, especially in the tribe Compso-

phorini: *Calleupalamus* Heinrich (two species), *Epijoppa* Morley (several species), *Leptophatnus* Cameron (three species), also represented in the cryptine genus *Oneilella* Cameron.

c. Predominantly black or dark brown, the mesoscutum and scutellum uniformly light orange or yellow. A rare and rather peculiar type of coloration, represented in a few genera of the Ichneumoninae and Cryptinae.

For some further notes on the subject of chromatic regional convergency see Heinrich, 1934, Mitt. Zool. Mus. Berlin, "Die Ichneumoninae von Celebes", p. 52-53.

The phenomenon of regional convergency seems not to be confined to color pattern alone. The Ethiopian Ichneumoninae show repeatedly also a peculiar structural character which does not occur in the Holarctic fauna or, so far as I know, in the fauna of the Oriental tropics. I am referring to specialization of the lower part of the genae and of the oral region which consist usually of an inward flection or partial obsoleteness of the lower carina genalis, and in the formation of a deepening or excavation on the bent inward side of the apical part of cheeks. Structures of this kind are found in quite different groups and tribes, as for example in two unrelated genera of the *Protichneumonini* and in two unrelated genera of the *Ichneumonini*.

Zoogeographical Remarks

In the north, the barrier of the Sahara desert separates the Mediterranean life-zone from the bulk of the African continent, the geographical base of this paper. The overwhelming majority of the vast African territory south of the Sahara is intertropical and represents what is called the *Ethiopian Region*. Although the latter comprises a multitude of differing climatic, geographical, and ecological conditions, its fauna as a whole appears as a well-characterized unit. Only the southern, moderate part of Africa shows different faunistic elements of its own. Along the African southeast coast, however (which, in contrast to the southwest coast has a rather humid climate), tropical vegetation has advanced far southward, forming small islands of tropical jungle-growth here and there, particularly in the coastal belt and the mouths of rivers. Consequently, tropical and Southafrican elements of the insect fauna interdigitate here in a way which excludes the drawing of a clear borderline between both faunistic regions.

The Ichneumoninae of the Ethiopian Region (including Madagascar) show some close relations to the Oriental fauna: first of all, there is the tribe Compsophorini which, with a multitude of very handsome forms, has reached the peak of speciation in the Ethiopian Region, and which is also fairly well represented in the Oriental Region, but seems not to occur in other parts of the world. The tribe Ischnojoppini shows a parallel zoogeographic pattern. It is represented in Africa and Madagascar, so far as is at present known, by eight species, in the Oriental Region by only one and it does not occur anywhere else. I may mention the Ethiopian genera *Apatetor* Saussure and *Leptophatnus* Cameron as a third case of the same zoogeographic category. They constitute, together with the very closely related Oriental genera *Cratojoppa* Cameron and *Ileanta* Cameron, a spe-

cial group which has flourished and produced a great variety of species in Africa, but is only moderately represented in tropical Asia. The genus *Elasmognathias* Ashmead has been believed to be a strictly Oriental and Indomalayan element, but will be recorded in this paper for the first time also from the African continent represented by three new species.

The selection of cases above, demonstrating the zoogeographic relationship between tropical Africa and tropical Asia, represents but another parallel of already well known facts. More interesting perhaps may be the absence, or poor representation, of certain groups in the Ethiopian Region. I am referring here to the tribe *Trogini* Heinrich with its two subtribes Callajoppina and Trogina Heinrich.

The *Trogina* are parasites of Rhopalocera, the genus *Trogus* Panzer of the genus *Papilio* in particular. The subtribe is represented by a fair number of genera and species in the Oriental Region as well as in the Neotropical Region, and it is, with the genus *Trogus*, distributed over the entire Holarctic Region. Although Africa is densely populated by a host of *Papilio* species, some of which are very common, not a single species of the subtribe Trogina has ever been recorded from the Ethiopian Region; as these are insects conspicuous enough not to be overlooked, I am convinced that the Trogina do not occur in Africa. *Dingtomus bicolor* Szépligeti (= *africanus* Morley), the only record of a species of Trogina from the Ethiopian continent, turned out to be a compsophorine of the genus *Epijoppa* Morley.

The *Callajoppina* are parasites of Sphingidae. Their distribution is almost the same as that of the Trogina. Although Africa is swarming with a multitude of different hawk-moths, only one genus of Callajoppina, *Afrotrogus* Heinrich, seems to occur there, with but three species. Compared with the 21 species recorded from North America, or the about 6 species known from the Oriental Region, this is an amazingly small number. It seems to indicate, that the tribe Trogini originated and flourished in another part of the world, and somehow failed to invade Africa successfully.

Ecological Notes

While the Hymenoptera Aculeata prefer the open, dry and hot habitats, and do not avoid the direct radiation of the sun, Ichneumoninae are, in general, confined to the shade of *forests* and to areas with comparatively high humidity. Few species only have adapted to drier locations and in semiarid regions Ichneumoninae are almost entirely absent. Consequently, in Africa the greatest number of species and individuals is concentrated in the mountain forests and in gallery forests along rivers and brooks. Wherever tropical lowland forests still exist, as at the present time for example in northwestern Angola and in the Congo, they too harbor a fair amount of Ichneumoninae. A moderate number of species occurs, furthermore, in the savannah woods (= Brachystegia type) of the interior plateaus, where loose stands of trees partially shade the grassy ground. In East Africa—Kenya and Tanganyika—many highmountain ranges and peaks arise to altitudes of 2000 meters and more, some up to the zones of eternal snow. All these elevations bear tropical cloud-forest in altitudes from about 1600 m up to about 2600 m. As most of these forests are separated by long stretches of lower grounds which are deforested and partially cultivated

since time immemorial, the cloud-forests represent, from the ecological point of view, isolated islands; they have been evolutionarily effective as such, causing the origin of endemic species and subspecies.

In the *coastal lowlands* the subfamily Ichneumoninae is very poorly represented, even on the humid eastern coast. A few species, however, are typical inhabitants of this biotope, as for example the genus *Neotypus* Foerster with a number of species, *Ctenocalus* Szépligeti and *Ischnojoppa* Cameron with a few species.

Biological Notes

At the beginning of this short chapter I like to mention the fact that today we still know next to nothing about the biology of African Ichneumoninae. There are a few observations on ecology, scarcely worth mentioning, and to my knowledge, altogether not more than three host records for the entire continent. As the host-parasite relation has to be considered as the most important part of the biology of this group, the almost total lack of information in this field represents a deplorable gap of knowledge and also a severe drawback for the correct judgment of many taxonomic problems.

There is another part of the biology of all tropical Ichneumoninae which still lacks elucidation: the problem of the relation of their life cycles to the seasonal changes between cool and hot, dry and humid climates. In the Ethiopian Region the contrast between the dry (cool) and rainy (hot) season is generally rather pronounced. The beginning of the rainy season brings a rejuvenation of vegetation and with it, an explosion of insect life. With the increasing coolness and drought of the dry season the multitude of insects diminishes more and more, although insect life, as a whole, never ceases entirely. This is the general pattern. How do the Ichneumoninae fit into it? In which stage do they survive the dry season? Are there marked differences between the life cycles of different tribes and genera? Do some, or most, species survive the dry season as fertilized female imagos, in a parallel to the hibernation of many Holarctic species? None of these questions has been answered yet.

In several tropical countries I had the opportunity to make, on some rare occassion, an observation which may have some bearing on the problems mentioned above. During a total period of seven years of field work in Celebes, Burma, Angola, South Africa and Tanganyika, it was altogether only 5 times that I met a locality where Ichneumoninae were concentrated in enormous numbers of individuals and species. What had attracted these masses of insects to certain, narrowly limited places, and what caused them to stay there? The concentrations always took place along a watercourse, either still carrying some water, or already dried out, sometimes in a fairly deep, shady ravine, always in the shade of trees and bushes. Each time it was between the middle and the end of the dry season and the places all seemed to have in common a slightly lower temperature and higher humidity than the entire surrounding region. So I do not doubt that these factors, features of the microclimate of the particular area of concentration, were the attraction for the wasps. This then seems to be the way how at least a part of tropical Ichneumoninae survive the worst period of the dry season. The fact that the overwhelming majority of "concentrated"

individuals were females, supports the hypothesis that these were fertilized specimens, like the hibernating females of the Holarctic. But, there were also a few males among the multitude of females, and this circumstance makes the truth of that hypothesis somewhat questionable.

In Basutoland (South Africa) Mr. C. Jacot-Guillarmod collected many Ichneumoninae, along with different other Hymenoptera, on the leguminous plant *Calpurnia intrusa* which, he told me, was at certain periods of the year very attractive to these insects. Mr. Jacot-Guillarmod observed, that the mentioned plant seems to have glands, at the bases of the leaves, from which he could pick up eagerly feeding Hymenoptera by hand. This type of concentration of Ichneumoninae at a source of food corresponds with the mass appearance of Diptera and Hymenoptera on plants infested by certain aphids, as known from the Holarctic and also from the tropics.

During July 1962, Mr. Bernd Heinrich camped for a week near the summit of Mt. Meru, Tanganyika, collecting birds at altitudes of about 2700 m. There, at the timberline, he observed numerous Ichneumoninae, mainly large specimens, sitting motionless upon and under leaves of lower bushes and plants. He was able to pick up dozens of these usually very swift and nervous insects by hand. This was just about the middle of the dry season and the coolest time of the year. The ichneumonids were too cold to be able to fly. As they belonged to species which usually occur in median altitudes, my explanation of the phenomenon is, that the ichneumonids flew up (for reason unknown) toward the summit region of the crater during a warmer spell in the lower altitudes and then were paralyzed and caught by the cold air gliding through the northeastern rift of the crater-hole. In a similar way great numbers of ichneumonids have sometimes been found paralyzed on the surface of snow fields in high altitudes of the European Alps.

Location of some Type Localities

1. *"Capland, Krebs"* (= *"Cafrerie"* in most of Tosquinet's original descriptions, based on type specimens with locality labels "Capland, Krebs") E. Stresemann's publication about the birds collected by Ludwig Krebs in South Africa 1820-1838, (Ann. Mus. Congo, Tervueren, 1954, pp. 77-82) gives a detailed account of the travels and collecting localities of Mr. Krebs, who, during the period mentioned, worked as collector for the Zoological Museum of the University of Berlin, then under the direction of Professor A. Lichtenstein. The publication reveals (loc. cit., p. 80), that Lichtenstein paid little attention to his collector's detailed locality reports, but used to replace the names originally reported to him by generalizations using "commonly understandable" terms, as for example "Kaffernland". Consequently the locality labels on the specimens collected by Krebs are neither exact nor authentic, and as they generally do not bear dates, reconstruction of a definitive locality from the roughly known itineraries of Krebs is not possible. The itineraries mentioned, according to Stresemann (loc. cit., pp. 80-81), reveal that all the shipments sent to Berlin (except the last one in 1839) were gathered in the area which is called today the Cape Province, partially around Cape

Town, but mostly in the Sunday River and Baviaan River areas, in the southeastern part of the province.

2. *"Scioa"*, given by Tosquinet as type locality for several African species, is the former Kingdom of *Shoa*, with the capital Addis Ababa, the southern part of present Ethiopia.
3. *"Ile de France"* (= Mauritius) and *"Ile de Bourbon"* (= Réunion). Both islands belong to the Mascarenes group, east of Madagascar.
4. *"Delagoa Bay"*. At Laurenco Marques, southern part of Portuguese East Africa (= Mozambique).
5. *"Birunga Range"*, village of Mikeno. North of Lake Kivu in the southwestern corner of Uganda.

Types

Holotypes

I have attempted to locate and examine the holotypes of all species described from Africa. The attempt was successful, almost without exceptions. In the treatment of each species and subspecies the following informations about the holotype are recorded:

1. Sex.
2. All data found on the locality label of the holotype; when given in quotations marks, these data are literally copied from the original label, including misspellings or other errors.
3. Collection where the holotype was kept at the time of the publication of this paper.
4. Where essential parts of the type specimen were found to be destroyed (as entire head, abdomen or antennae), the missing parts are recorded.

Allotypes

No attempt has been made to locate all the specimens on which the descriptions of the other sex of holotype were based; when the allotypes were located during the search for holotypes, their data and location are recorded.

Paratypes

Paratypes of species already described were not methodically searched for, and are recorded only occasionally when for some reason or other such records appeared to be useful. For the species described from Madagascar by Heinrich in 1938, only specimens reexamined in 1964-1966 and confirmed by the author as members of the original type series are recorded as paratypes; many of the Madagascan species described by Heinrich are represented by numerous further paratypes, not labeled as such, in C.G.H.I. in Warsaw and also in M.N.H.N. in Paris.

Nomenclature

I dŏt not follow Townes in a few generic names because I accept the decisions of the International Commission on Zoological Nomenclature, which has ruled the names *Ichneumon, Pimpla, Ephialtes* and *Cryptus* to be nomina conservanda. Consequently, in this paper I use *Coelichneumon* Thomson instead of *Ichneumon* (sensu Townes) and *Ichneumon* Linnaeus instead of *Pterocormus* (sensu Townes). There are further nomenclatorial questions and problems which need to be discussed seperately at the different taxonomic levels.

The higher categories.—While during the first half of the 20th century

in execution of the principle of priority the species names of animals slowly, but incessantly approached the ultimate goal of stabilization and worldwide acceptance, the nomenclature of higher categories was advancing in the reverse direction, to instability and continuous vacillation, that is. Here the increasing confusion has but little to do with the application of the principle of priority and resulting judicial controversy. Instead the main reason for the unsatisfactory evolution on the higher levels of taxonomy is a consequence of the intrinsic nature of the higher taxonomic categories. While a species is a natural reality, the existence of which can be recognized and could be in the majority of cases even genetically proven, the genus or tribe is the conception of a taxonomist, a hypothesis of the human mind, a conventional term, an attempt to catch and press the stream of life—or the tree of evolution, whichever allegory one prefers—into nicely limited pigeonholes. Consequently, the concept of a genus and of a tribe, as well as particularly the limitation of both, is—as unpleasant as it may sound—a mere matter of personal judgment, largely depending on the individual turn of mind, the degree of individual experience and even the periodically changing conventional tendencies. Such trends may involve the simplification of the system for the needs of the less experienced by lumping as many as possible of the existing genera, or they may involve splitting large genera into smaller units, as far as that seems to provide a clearer image of the evolutional branches and twigs. This tug of war has kept taxonomists busy for decades and a renowned biologist allegedly has ridiculed it, saying "lumpers and splitters live in a symbiosis—the ones lump what the others split". I have the personal impression that the tendency to lump or split is not only a matter of changing scientific fashion and mass suggestion, but also of the age and experience of each particular author. As it seems to me, the human eye confronted with a multitude of closely related forms or species will recognize at first their common characters, learning much later to see and to evaluate the distinguishing signs. When I visited the African continent for the first time, all Africans looked to me very much alike. After years of living among them I saw their individual and tribal differences just as clearly and strongly as in the population of my own country. It would be possible to give many other examples. Probably it is a kind of general rule, that a person in the earlier part of his life as taxonomist is more inclined to generalize and to "lump", moving slowly to more and more refined recognition of differentiations and thus to a stronger tendency to split. This, of course, may lead again into extremes. What is right and what is wrong? There is no measure, no standard, no proof. The extremes at both ends are certainly not appropriate. But in the middle there is a broad scale open to be used "ad libitum" and thus causing the deplorable juggle with generic names—which is one of the worst drawbacks of contemporary taxonomy. I am unable to suggest a remedy because a thing which indeed is and will stay a matter of personal opinion can, like taste, not even be made the object of dispute, and much less so, of an international ruling. But, if only we taxonomists would realize the unalterably arbitary character of the concept and limits of generic and tribal units and consequently the futility of continuous changes, it may help us to adopt a more conservative attitude, which, I am convinced, would be the only way to real improvement.

The tribes.—In addition to the above mentioned basic problem involving the taxonomy of higher categories, the stability of tribal names seems to be disturbed also by discrepancies in the interpretation of the principle of priority. This becomes evident, for example, in the "Catalogue and Reclassification on the Indo-Australian Ichneumonidae", Townes, Townes and Gupta, 1961. In this paper we find the nomenclature of nearly all tribes of the Ichneumoninae radically altered. So, for example, the name of the tribe *Protichneumonini* Heinrich (1934) is replaced by *Ichneumonini* Townes (nec Ashmead). At first glance this seems to be not more than the logical consequence of Townes' personal decision to reject the ruling of the International Commission on Zoological Nomenclature concerning the genus *Ichneumon* Linneaus, as mentioned in the first paragraph of this chapter. However, this change of tribal names is influenced by yet another principle: by the assumption that the name of a tribe has automatically to be derived from the name of the oldest genus included in this tribe. Evidently under this same supposition the name of the tribe *Oedicephalini* Heinrich has been replaced by *Notosemini* Townes in the same paper, and the name of the tribe *Platylabini* Heinrich by *Pristicerotini* Townes. This represents the original interpretation for the application of the principle of priority in tribal taxonomy which I formerly accepted myself. But, as soon as I realized that the execution of this interpretation meant to perpetuate the change of tribal names, I became strongly opposed to it. The limitations of tribes are even more a matter of personal opinion and hypothesis than the limitations of genera. It seems unlikely that there will ever be a complete agreement in this regard between two authors doing similar research. Consequently, practically every author would be bound to use his private tribal names according to the oldest name among the genera he likes to include in a given tribe. This seems to lead to a most undesirable situation. For the benefit of tribal taxonomy it would, evidently, be a much better interpretation of the principle of priority to protect the stability of a given tribal name regardless of whether that name is derived from the oldest genus transiently included in the tribe or not. To protect instead the right of the momentary oldest genus included in the tribe to form the name of the latter seems to be an inversion of the principle of priority; it can not work toward the aim of stabilization of nomenclature, as the limits of a tribe can not be fixed, but will stay flexible and vacillating, according to different opinions of authors. The International Commission of Zoological Nomenclature has adopted a corresponding point of view by the Article 64 which reads as follows: "A zoologist establishing a new family-group taxon is free to choose as type genus any included nominal genus, not necessarily that bearing the oldest name". According to this suggestion it seems to be appropriate to maintain the names of the tribes *Ichneumonini* Ashmead, *Protichneumonini* Heinrich, *Platylabini* Heinrich and *Oedicephalini* Heinrich as established by Heinrich 1934 in the Mitt. Zool. Mus. Berlin. pp. 54-58 and 64-65. The new tribe *Goedartini* Townes I am inclined to restrict to the nominate genus *Goedartia* Boie, a palaearctic and alpine-oriental genus, and to include perhaps the genus *Maraces* Cameron. The oriental genera *Charitojoppa* Cameron, *Compsophorus* Saussure (=Habrojoppa Cameron) and *Xenojoppa* Cameron I do not consider to be closely related to *Goedartia*. I shall treat them in this paper as an independent

tribe, *Compsophorini*, with numerous species in the Ethiopian tropics. The name *Comsophorina* Heinrich has been mentioned for the first time in the "Synopsis of Nearctic Ichneumoninae", 1962, p. 688, as a subtribe of the *Listrodromini*. I doubt now the correctness of this association. Future research revealing the biology of the Compsophorini, and particularly their hosts, will be necessary to gain more solid ground for taxonomic judgment of this interesting group.

Genera.—This is the main battlefield for the tug of war between lumping and splitting tendencies. I voiced my opinion and comments on this dilemma above in the paragraph: "The higher categories". Here I shall only explain my personal points of view as applied in this paper.

Under a genus I understand—imaginatively—a twig of the tree of evolution, and practically, either a species indicating high specialization by extraordinary characters, or a group of species indicating close relationship through common structural, biological and sometimes chromatic pattern.

Some authors tend to make it a criterion of the validity of a genus that no intermediate degrees are found between its distinctive characters and those of another genus. I can not believe in this principle. I think we can assume it as a matter of fact that all twigs on the growing tree of evolution must be connected. The only difference possible is whether the intermediates are still living or are already extinct. In other words: whether we are able to see them or not. This seems to me an artificial difference, not a principal criterion. Particularly in a young subfamily, as the Ichneumoninae probably are, intermediate characters can be expected to be still in existence more frequently than in most other groups. Hence the genera can not be so sharply separated as our taxonomic mind would like. One has to accept the facts or else move back quite a bit toward Linnaeus' concept of the genus *Ichneumom.*

My attitude toward the genera already named by previous authors is strictly conservative. I shall try to maintain a genus if its type species shows any distinctive character somehow justifying generic status, even if my personal opinion should consider the latter as arbitrary.

Whether or not I am going to regard certain characters as generically distinctive will not only depend upon the degree of their prominence and conspicuousness, but also and mainly on the number of species sharing them. If, for example, a large group of Ethiopian species has some special structural or sculptural characters in common I would call it a genus, even if these distinctions are rather subtle or not very strongly different from corresponding characters in a genus of another faunistic region. Biological characters I believe to be at least as important as structural ones—a point of view already generally accepted in ornithology.

I think the time for "homogenizing" the genera of the three great tropical regions of the world has not come yet. Our knowledge of the Ichneumonidae of the tropics, and particularly of tropical South America, is so poor and defective, that an attempt to coordinate would have little hope of creating a true cosmos, but a good chance to cause some confusion. If we draw conclusions from the taxonomy of other families, for example birds, as a parallel, we can scarcely expect one genus to be shared by the

Ethiopian and Neotropical Region, while on the other hand we are not surprised to find a few genera distributed over the Ethiopian and Oriental Region.

Species and Subspecies.—Under "Ecological Notes" I mentioned the cloud-forests of the isolated high mountain ranges of East Africa and the differentiation of their common inhabitants. Among the birds the forms of different cloud-forests are often but slightly divergent and obviously to be regarded as associated subspecies (as in the species *Francolinus squamatus* Cass. or *Turdus olivaceus* L.), sometimes, however, the differentiation has reached higher degrees producing endemic species (*Alethe montana* Reich. and *Alethe lowei* Grant and Praed). The Ichneumoninae of the high mountains display parallel features. If we consider, however, the number of very similar species of Ichneumoninae often occuring side by side, it is sometimes impossible to recognize the proper subspecific relations with sufficient degree of probability. I generally prefer therefore to name a form as a species rather than as a subspecies. unless the correct association is assured beyond doubt. There are also rather strong differences between corresponding West—and East African forms. Here too, the differences vary in degree, but seem to be more often specific than merely subspecific.

Key to the African tribes and subtribes of the Ichneumoninae Stenopneusticae

1. Frons with two or four longitudinal carinae; lateral lobes of mesoscutum depressed, separated from median lobe throughout its length by irregularly and coarsely transversely rugose notauli. (Thyridia very large, removed from the base of second tergite, the space between them narrow; propodeum without regular areolation, its dorsal surface with only one distinct transverse carina, separating the smooth anterior part from the coarsely rugose posterior part; mandibles short and wide, teeth separated by a deep, wide gap; areolet irregularly rhomboidal, sometimes petiolate.) ..... II. *Ceratojoppini* Heinrich

   Frons without longitudinal carinae; lateral lobes of mesoscutum not depressed; notauli, with very few exceptions. abbreviated and less pronounced. 2

2. Propodeum abbreviated, with a smooth culminating boss or arch, and steeply declivous both before and behind the culminating point. (Areolet large, obliquely trapezoid, with prolonged second intercubitus and abbreviated second abscissa of cubitus; scutellum usually strongly gibbose or pyramidal; medium-sized to very large forms.) ..... IV. *Trogini* Ashmead 3

   Propodeum without culminating boss or arch. (Areolet usually pentagonal or rhomboidal.) 4

3. Tergites 1 to 4 or 1 to 5 or to 6 extremely sclerotized, with extremely coarse sculpture, their surface usually having plastic features such as convexities, concavities, ridges, and lateral slopes. (Medium-sized forms; parasites of Papilionidae.) ..... subtribe *Trogina* Heinrich (not recorded from Africa)

   Tergites not extremely sclerotized, without extremely coarse sculpture and without unusual plastic features, but densely and finely punctate or coriaceous, usually opaque. (On the average large forms, more than 18 mm long; parasites of Sphingidae.) ..... subtribe *Callajoppina* Heinrich

4. Areolet large, obliquely trapezoid, petiolate, with prolonged second intercubitus and abbreviated second abscissa of cubitus; horizontal part of propodeum on each side with deep depression. (Very large species, about 25 mm long, with dark wings and the general appearance of a pompilid.) ..... 28. genus *Pepsijoppa* Heinrich (see end of tribe Trogini)

   Areolet and propodeum differently shaped; smaller species. 5

5. Head extremely thick, nearly cubical, with the occiput between ocelli and occipital carina unusually wide and nearly level with vertex, that is, without distinct declivity. (Flagellum of female bristle-shaped, very long and slender; mandibles short and very wide, sometimes twisted, with very deep and wide gap between teeth; smaller species, 8—10 mm long.) ..... V. *Oedicephalini* Heinrich

Head not extremely thick, usually not nearly cubical, with the occiput immediately or close behind ocelli always steeply sloping down toward carina occipitalis. 6

6. Face, clypeus, and malar space together forming a single continuous, slightly convex plane, without sutures, elevations, or depressions, and mandibles short and wide, with a deep, wide gap between subequal teeth. 7

Face, clypeus, and malar space do not form a single continuous, slightly convex plane, or if they almost do, mandibles differently shaped. 9

7. Areolet regularly pentagonal, the intercubiti widely separated in front; propodeum of the broken type, abbreviated, the horizontal part medially at least somewhat, often considerably shorter than the area posteromedia; flagellum of females comparatively short, never perceptably widened beyond middle, and only slightly to moderately attenuated at apex; claws I and II or all claws often pectinate in females; parasites of Lycaenidae only. (Fairly small forms, usually with rich white markings.) ..... VI. *Listrodromini* Heinrich

Areolet rhomboidal or at least strongly narrowed in front; propodeum either sloping down from base to apex in a gradual curve, or, if of the broken type, the area posteromedia much shorter than the horizontal part medially; flagellum of females either very long and slender, bristle-shaped, and not widened beyond middle, or short, lanceolate, and strongly widened beyond middle; claws never pectinate. 8

8. Abdomen very slender and elongate, with the second and third tergites considerably longer than wide; propodeum of the broken type, with short declivity; mesoscutum without unusually coarse rugosity; flagellum of females short, lanceolate; areolet usually pentagonal, strongly narrowed in front. (All known species of stramineous or orange-ferruginous basic color, often with white anal mark.) ..... III. *Ischnojoppini* Heinrich

Abdomen in great majority of species broadly oval, never very slender, the second tergite not, or not much longer than wide; propodeum sloping down from base to apex in gradual curve; mesoscutum with extremely coarse rugosity of various patterns; flagellum of females bristle-shaped, long and slender, not widened beyond middle, strongly attenuated at apex; areolet usually rhomboidal. (Small to very large species, some of ferruginous, most of them of metallic blue or metallic green basic color, abdomen often with apical white markings.) ..... VII. *Compsophorini* Heinrich

9. Apex of mandible twisted, sometimes so that the lower tooth is toward mouth making mandible appear sickle-shaped. 10

Apex of mandible normal or only slightly twisted. 11

10. Gastrocoeli large and deep, transverse, the space between them much narrower than one of them; abdomen rather stout, broad-oval to longish-oval, apically obtuse, ovipositor not projecting: the second tergite apically as wide as medially long, usually wider than long; clypeus flat, without basal convexity; propodeum short, the areae dentiparae without projecting angles, curved downward; anterior tergites coarsely rugose, usually medially aciculate, rather strongly sclerotized and separated by pronounced sutures; claws of females sometimes strongly pectinate. (Head structure usually similar to the *Compsophorini*, with wide temples and cheeks but not completely devoid of plastic features.) ..... VIII. *Ctenocalini* Heinrich

Gastrocoeli small and superficial to obsolete, thyridia very seldom large and wide, with narrowed space between them; abdomen slender, often elongate, apically pointed, with projecting ovipositor; second tergite distinctly to considerably longer than apically wide; clypeus basally convex, its apical part usually polished, more or less distinctly concave, the apex thinned and projecting in a blunt curve; propodeum of the clearly broken

type, apices of areae dentiparae slightly projecting; anterior tergites finely sculptured and not separated by strongly impressed sutures; claws of females not pectinate. ..... XI. *Acanthojoppini* Heinrich

11. Petiole flattened, wider than high; clypeus more or less distinctly convex. (Small to medium-sized species with short propodeum; females usually with comparatively short, approximately oval, apically blunted abdomen; with very few exceptions parasites of Geometridae.) ..... IX. *Platylabini* Heinrich

Petiole not wider than high, or if so, clypeus not convex. 12

12. Petiole somewhat wider than high. (Abdomen of females somewhat elongate and narrow, amblypygous; gastrocoeli small but fairly distinct; scutellum gibbose; the only known Ethiopian species black with legs, scutellum, and most of flagellum orange-yellow.) ..... X. *Eurylabini* Heinrich

Petiole normal, not wider than high. (Areolet pentagonal or rhomboidal.) 13

13. Areae dentiparae curving down gradually, usually close to the base of coxae III, their apices not at all projecting but flush with the surface of the slope. (Gastrocoeli usually rather deep.) ..... I. *Protichneumonini* Heinrich 14

Propodeum of the broken type, with a differentiated horizontal part and declivity, the apices of areae dentiparae usually projecting to various degrees: from sharp corners to long apophyses. ..... XII. *Ichneumonini* Ashmead 15

14. Propodeum short, the areae dentiparae fairly steeply curved; areolation usually complete; area superomedia always narrowed in front, shaped like a horseshoe, semioval, gothic arch, or hexagon. (Abdomen without white anal marks.) ..... A. *Protichneumonina*, new subtribe

Propodeum more elongate, the area posteromedia usually distinctly to much shorter than area superomedia and area basalis together; areae dentiparae more gently sloping downward toward base of coxae III, tending to become confluent apically with the areae posteroexternae; area superomedia usually confluent with area basalis, forming a long central area which tends to project medially in front toward postscutellum and often is contiguous to the latter. (Abdomen often with anal marks.) ..... B. *Apatetorina*, new subtribe

15. Apex of abdomen of females amblypygous and thyridia obsolete or inconspicuous, gastrocoeli indistinctly or, at the most, moderately impressed. (Areolet pentagonal, the intercubiti widely separated in front; median field of postpetiole aciculate, or sometimes punctured or rugose; sternites tend to be strongly sclerotized in most genera, plica consequently often restricted to the second and third sternites, sometimes lacking; hypopygium of males often projecting; clypeus always normal.) ..... B. *Amblytelina*, new subtribe

Apex of abdomen of females usually oxypygous; thyridia often conspicuous and gastrocoeli distinct. 16

16. Clypeus distinctly convex longitudinally and transversely; scutellum extremely raised above postscutellum but not (or indistinctly) laterally carinate. (Propodeum with very strong apophyses; areolet pentagonal, the intercubiti widely separated in front.) ..... *Hoplismenina*, new subtribe (not recorded from Africa south of the Sahara)

Clypeus not or scarcely convex; scutellum not extremely raised, or if so, then with high lateral carinae. 17

17. Gastrocoeli distinctly, sometimes deeply impressed, sometimes very large and transverse; postpetiole and usually one or two of the following tergites strongly sculptured, often medially aciculate or coarsely rugose-punctate; areolet usually pentagonal, with intercubiti widely, or at least somewhat separated in front, rarely rhomboidal. (Thyridia distinct, sometimes very conspicuous.) ..... A. *Ichneumonina*, new subtribe

Gastrocoeli only slightly impressed, usually inconspicuous, often absent; thyridia usually distinct, often removed from base of second tergite, sometimes wide, with narrow space between them, sometimes absent; sculpture of anterior tergites finer than in Ichneumonina, usually smooth with sparse puncturation, often coriaceous or finely rugose, rarely the median field of postpetiole finely longitudinally striate. 18

18. Scutellum extremely raised above postscutellum, with high, often lamelliform lateral carinae; mesoscutum considerably longer than wide, the median lobe sometimes raised and or bipartite; occiput and temples very steeply, often vertically declivous behind eyes and ocelli, sometimes even concave; cheek profile often long and converging (usually in straight line) toward mandible base; flagella and legs extremely long, slender; ovipositor strongly projecting. (Propodeum tending to have long apophyses; carinae genalis and oralis tending to exhibit strange specializations; mandibles slender with weak apical teeth; areolet rhomboidal, sometimes petiolate.) ..... C. *Aethioplitina*, new subtribe

Scutellum not or moderately raised above postscutellum, with or without lateral carination; mesoscutum normal; structure of head usually normal; flagella and legs not or only moderately elongate; ovipositor usually not or only slightly projecting. ..... D. *Cratichneumonina*, new subtribe

I. Tribe *Protichneumonini* Heinrich

Protichneumonini Heinrich, 1934, Mitt. Zool. Mus. Berlin, XX, p. 64 and 84.

Type genus.—Protichneumon Thomson

The tribes will not be arranged on taxonomic principles in this paper, but will appear merely in the order of completion. If arranged according to the supposed degree of specialization, this tribe should be placed close to the end of the line, linking the Ichneumonini with the Trogini, being the obvious forerunner of the latter group, which shows the highest specialization of all the tribes of the Ichneumoninae.

In the typical Protichneumonini known to us from the Holarctic region, the structure of propodeum with its abbreviated and apically rounded shape, and with its distinct to wide basal furrow, indicates the beginning of the evolutional development that is far advanced in the Trogini.

Typical Protichneumonini do not seem to occur in the Ethiopian region. Although I have examined the types of all African Ichneumoninae described so far and most of the African material of this subfalimy in the museums of the world, I have not found a single typical species of the genera *Protichneumon* Thomson or *Coelichneumon* Thomson, or of any of the other Holarctic genera so far included in this tribe. Instead, the Ethiopian fauna contains a number of genera which agree well enough in several characters with the Holarctic Protichneumonini, but differ almost completely in certain peculiarities of the propodeal structure, especially in the fusion of the area superomedia with the area basalis (and often area posteromedia) into one elongate central area of the propodeum. It seems to be natural to include this entire group of related genera in the tribe Protichneumonini, but I prefer to separate it from the genuine Holarctic and alpine Oriental tribe as a subtribe. As the first named genus of this subtribe is *Apatetor* Saussure, I am calling it Apatetorina. This subtribe seems to be of tropical origin. It has evidently flourished in Africa; some genera, however, are also found in the Oriental tropics (as, for example, *Cratojoppa* Cameron).

Key to the genera of the *Protichneumonini* of Africa south of the Sahara

1. Carination of propodeum complete, in particular area superomedia more or less distinctly separated from area basalis (fig. 1). (Basal furrow of propodeum present). 2

Carination of propodeum incomplete, at least area superomedia and basalis confluent, forming one continuous area centralis. (Sometimes also area centralis and posteromedia confluent, or area dentiparae and postero-

externae; basal furrow of propodeum often medially or entirely obsolete). 3

2. Abdomen of females normal and without anal marks; area superomedia not elongate; basal furrow of propodeum pronounced; mandibles normal ..... 1. *Musakia* Strand

Abdomen of females strongly narrowed and elongate, with white anal marks; area superomedia elongate, about 5 times as long as wide at costulae, carrot-shaped; basal furrow of propodeum reduced; mandibles stout and wide, the teeth separated by a wide gap. ..... 14. *Chasmopygium*, new genus

3. Postpetiole, including median field, uniformly and densely punctured. 4

Postpetiole not uniformly and densely punctured, its median field smooth, coriaceous, irregularly rugose-punctate, or aciculate. 7

4. First segment of flagellum distinctly shorter than second; basal furrow of propodeum present. (Scutellum only slightly convex, laterally not carinate, or weakly at the base only; postpetiole rather flat, without distinct median field; gastrocoeli small and rather shallow). ..... 6. *Punctileptops*, new genus

First segment of flagellum distinctly longer than second; basal furrow of propodeum obsolete, area centralis medially projecting and adjacent to postscutellum. (Postpetiole usually with distinct median field). 5

5. Scutellum laterally not carinate, approximately semiglobular in females, subpyramidal in males. (Gastrocoeli deep, temple and cheek profiles distinctly narrowed; femora slender; abdomen chestnut-red to black, without anal markings, mesoscutum often with median yellow mark). ..... 19. *Corymbichneumon* Morley

Scutellum flat to moderately convex, sometimes laterally carinate. 6

6. Abdomen of females semiamblypygous, broadly oval; gastrocoeli rather small and shallow, with small, sometimes obsolete thyridia; median part of area superomedia confluent with area basalis and somewhat projecting toward postscutellum (fig. 37). (Females with black, usually apically ferruginous abdomen, similar in appearance to some Oriental species of the genus *Amblyjoppa* Cameron; sexual dichroism pronounced; males with transverse yellowish bands on abdomen). ..... 23. *Aethiamblys*, new genus

Abdomen of females clearly oxypygous, as in *Coelichneumon;* gastrocoeli rather large and deep, with distinct thyridia; areae superomedia and basalis completely fused (fig. 40); central area smooth and shiny, anteriorly broadly contiguous to postscutellum.[1]) ..... 20. *Afrocoelichneumon* Heinrich

7. Lower part of carina genalis and/or carina oralis with specialized structures, such as lamelliform elevations or triangular projections or appendages (figs. 23, 28-33). (Central area of propodeum of the "wedge-shaped" type, contiguous or nearly contiguous in front to postscutellum, elongate, its straight sides gradually converging from base to apex; carination of propodeum often partially obsolete). 8

Lower part of carina genalis and of carina oralis normal. 11

8. Wings clear, with deeply infuscated apical band; carina genalis highly lamelliform, forming a broad brim along hind border of cheeks (fig. 23); propodeum comparatively short, rather steeply curved downward (fig. 24). (Scutellum strongly convex and rather strongly elevated above postscutellum, laterally carinate to the middle; carination of propodeum extensively obsolete; notauli subobsolete). ..... 12. *Fasciphatnus*, new genus

Wings clear, without infuscated bands; carina genalis differently shaped; propodeum comparatively longer, more gradually sloping in a long and gentle curve. 9

9. Basal third of notauli distinct; flagellum of females filiform and short; scutellum laterally not carinate; genae of females sometimes with enormous appendages, or else carina oralis with triangular apical projection and frons with sharply pointed horns or with bisinuate carina (figs. 27-33). (Postpetiole and middle of anterior tergites usually strongly aciculate; coxae III of females without scopa.) ..... 15. *Genaemirum* Heinrich

Notauli obsolete; flagellum of females pronounced bristle-shaped, strongly

[1]) If frons or face with hornlike projection, see genus 15. *Genaemirum*.

attenuated at apex, moderately to fairly long; genae of females without appendages; frons without horns or carinae. 10

10. Lower part of cheeks, before mandible base, with strong constriction, forming, in lateral view, a strongly curved emargination (fig. 20); carina genalis apically obsolete; carina oralis lamelliform, its upper part curved backward toward emargination of genae; clypeus of females receding from base toward apex in a gentle curve; metatarsus III of females normal. (Scutellum weakly carinate on basal part or to beyond middle; apex of second and the third tergite weakly sculptured; ovipositor of females distinctly projecting.) ..... 11. *Oriphatnus*, new genus

Lower part of cheeks and carina genalis normal, carina oralis, however, with triangular projection a short distance before carinal junction (fig. 25); clypeus of females not receding; metatarsus III of females laterally compressed and ventrally widened (fig. 22). (Scutellum laterally distinctly carinate to apex; tergites 2 and 3 strongly sclerotized and coarsely sculptured, sharply separated from each other; ovipositor of females hidden, their abdomen apically blunt, nearly semiamblypygous.) ..... 13. *Triangulora*, new genus

11. Subapical tooth of mandibles small, not as normally in the same plane with apical tooth, but slightly bent inward; clypeus without lateral corners, laterally oblique, medially slightly emarginate. (Gastrocoeli large and deep, with narrowed interval; propodeum gently slanting from base to apex, the central area with almost straight lateral carinae, gradually converging from base to apex.) ..... 7. *Apatetorides* Heinrich

Subapical tooth of mandibles normal, on level with apical tooth. 12

12. Second and third tergites finely sculptured (fig. 5), usually very finely coriaceous and without puncturation, sometimes finely but sparsely punctured, never medially aciculate, usually shiny; first tergite medially smooth or very finely sculptured, exceptionally with vestiges of faint aciculation. (Gastrocoeli small and shallow; mandibles normal, rather slender.) ..... 2. *Apatetor* Saussure

Second tergite and usually at least part of the third coarsely and densely sculptured, often subopaque, either medially longitudinally striate or rugose-punctate or just strongly and densely punctured; first tergite often medially strongly aciculate or rugose. (Gastrocoeli almost always deep and large.) 13

13. Gastrocoeli, and particularly thyridia, extraordinarily large, the former rather deep, separated from each other by a very narrow bridge only. (Scutellum laterally carinate; basal furrow of propodeum distinct; first tergite not clearly aciculate, second densely and coarsely rugose-punctate; abdomen black with white pattern on all tergites except the fourth.) ..... 21. *Stenapatetor* Heinrich

Gastrocoeli and thyridia less spectacular, though sometimes also rather deep and wide. 14

14. Scutellum laterally not carinate, except sometimes weakly at the very base. (Scutellum flat or even depressed, except in *Coeloleptops* where it is semiglobular.) 15

Scutellum always laterally distinctly carinate, at least to the middle. (Scutellum moderately to strongly elevated; basal furrow of propodeum usually present.) 20

15. Mandibles slender with rather small subapical tooth. (Tergites 1-3 dorsally strongly aciculate, separated by deep sutures from each other; resembles a Holarctic *Coelichneumon*, but the propodeum is anteriorly contiguous to postscutellum, sloping from there in a gradual, even curve to the base of coxae III; color predominantly red-brown.) ..... 18. *Pseudocoelichneumon*, new genus

Mandibles wide and robust, with distinct, sometimes wide and deep, gap between apical teeth. 16

16. Mesoscutum medially about as wide as long, polished, without notauli; sides of clypeus rounded; mandibles very short and wide, as in tribe Compsophorini, their body not much longer than the subequal apical teeth, which

are separated from each other by a wide gap. (Propodeum short, adjacent to postscutellum, gradually rounded; anterior tergites medially strongly striate; cheeks and temples very wide; abdomen stout, without white pattern.) ..... 16. *Liojoppa* Szépligeti

Mesoscutum medially distinctly longer than wide; usually notauli basally distinct; clypeus with normal lateral corners; mandibles usually comparatively longer, though likewise stout; upper tooth distinctly longer than lower tooth. 17

17. Scutellum semiglobular; propodeum with narrow basal furrow; abdomen of females narrow and elongate. (Gastrocoeli large and deep; postpetiole strongly striate; temples and cheeks wide.) ..... 4. *Coeloleptops*, new genus

Scutellum normal, not, or slightly, raised above postscutellum, dorsally flattened to slightly convex; abdomen of females of normal width (except in *Protoleptops*, new genus, in which it is comparatively narrow and elongate). 18

18. First segment of flagellum shorter than second; central area of propodeum anteriorly separated from postscutellum by distinct transverse furrow, irregularly rugose; areae dentiparae apically bordered by distinct carinae; postpetiole densely and neatly punctured, except apical part of middle usually smooth (fig. 11). (Gastrocoeli small and shallow; second tergite very densely punctured, subopaque; white anal pattern present.) ..... 6. *Punctileptops*, new genus

First segment of flagellum longer than second; central area of propodeum anteriorly contiguous to postscutellum, smooth and shiny; areae dentiparae apically not bordered by distinct carinae, confluent with area posteromedia and often with areae spiraculiferae as well; postpetiole and middle of second tergite aciculate or sometimes rugose or rugose-punctate. 19

19. Carination of propodeum incomplete; costulae lacking, areae dentiparae confluent with areae posteroexternae and with areae spiraculiferae as well (fig. 13); abdomen normally sclerotized, without impressed sutures between tergites; propodeum sloping gradually from postscutellum to base of coxae and also from central area toward sides. (Large species, up to 20 mm long, with white pattern on anterior tergites combined with white anal pattern; tarsi III often extensively white; specializations of carinae genalis and oralis known in one species.) ..... 8. *Apatetorops*, new genus

Carination of propodeum nearly complete: costulae strong, also carinae dentiparae exteriores distinct, even forming a slight ridge between areae dentiparae and spiraculiferae; abdomen rather strongly sclerotized, with distinctly impressed sutures between tergites 2-5; propodeum not gradually sloping from base to apex and also not apico-laterally, instead a horizontal part and apical declivity indicated and areae dentiparae and spiraculiferae separated by a slightly prominent ridge. (Large species with white anal pattern and laterally white scutellum.) ..... 5. *Protoleptops*, new genus

20. Tergites 2 or 2 and 3 medially strongly longitudinally striate, or else tergites 2 to at least middle of 4 coarsely rugose-punctate; carina coxalis usually distinct. (Gastrocoeli large and deep; flagella of males without distinct sigilla.) 21

Anterior tergites not longitudinally striate, except sometimes the postpetiole; at least the entire fourth tergite weakly sculptured; carina coxalis wanting. (Gastrocoeli usually of medium size and rather shallow; flagella of males usually with distinct sigilla.) 25

21. Scutellum very strongly raised above postscutellum, approximately semiglobular; abdomen of females narrow and elongate. (Carinae coxales distinct.) ..... 4. *Coeloleptops*, new genus (partim)

Scutellum slightly to moderately convex only; abdomen of females normal. ... 22

22. Tergites 1-3 very sharply and strongly longitudinally striate and without latero-apical white marks. (Carinae coxales obsolete.) 23

Tergites 1-3 medially not sharply and strongly longitudinally striate, but coarsely rugose-punctate, with large latero-apical white marks. (Carinae coxales usually distinct.) 24

23. Propodeum rather short, slanting from base to apex in a continuous, fairly

steep slope; separation of horizontal part and declivity not indicated; notauli completely obsolete. (Mesoscutum polished, without punctation; mandibles short and stout, with subequal teeth, separated by a wide gap.) ..... 17. *Liojoppites*, new genus

Propodeum less abbreviated, not slanting from base to apex in a continuous, fairly steep slope, instead a horizontal part and declivity indicated; notauli very distinct and rather long. (Mesoscutum polished or punctured; mandibles not distinctly abbreviated.) ..... 3. *Coelapatetor*, new genus

24. Areae dentiparae curved deeply downward almost to base of coxae III; gastrocoeli, and particularly thyridia extraordinarily large, the space between reduced to an extremely narrow bridge; carinae coxales subobsolete. ..... 21. *Stenapatetor* Heinrich

Areae dentiparae scarcely curved at all, instead slanting moderately in an oblique slope (fig. 26); gastrocoeli and thyridia large, but not extraordinarily widened; carinae coxales distinct. ..... 22. *Pseudocillimus* Roman

25. First flagellar segment of females distinctly shorter than second; area centralis very elongate (fig. 36), with pronounced constriction, separating area basalis from area superomedia, although the transverse carina separating both is incomplete; area basalis strongly widened from constriction to basal furrow of propodeum; area superomedia „carrot-shaped", about 5 times as long as wide at costulae (fig. 36); abdomen of females very slender; notauli subobsolete; lower part of sides of face forming a prominent ridge which continues onto the base of sides of clypeus (fig. 35). (Coxae III of females without scopa; postpetiole aciculate.) ..... 14. *Chasmopygium*, new genus

First flagellar segment of females distinctly longer than second; area centralis either not elongate, or, if long and narrow, then without constriction and completely fused with area basalis; abdomen of females of normal shape; basal fourth or fifth of notauli distinct; no prominent ridge on sides of face and clypeus. (Coxae III of females with scopa; postpetiole only exceptionally medially striate.) 26

26. Basal furrow of propodeum distinct; area centralis more or less widened at costulae, always narrowed from costulae toward apex, sometimes also slightly narrowed toward base or parallel-sided before costulae, usually rugose, exceptionally subobsolete by coarse rugosity (figs. 14-16). (Postpetiole laterally punctate, medially smooth or finely irregularly rugose.) ..... 9. *Leptophatnus* Cameron

Basal furrow of propodeum obsolete or subobsolete; central area "wedge-shaped" (fig. 19), not widened at costulae, but widest at postscutellum and gradually narrowed from postscutellum to apex, anteriorly contiguous or almost contiguous to postscutellum, smooth and shiny. (Sculpture of postpetiole usually more distinct than in *Leptophatnus* Cameron, medially sometimes longitudinally striate.) ..... 10. *Pseudophatnus*, new genus

I. A. Subtribe *Protichneumonina*, new subtribe

Morphological characters

Flagellum.—Female flagellum, with very few exceptions, bristle-shaped, more or less (sometimes very strongly) widened beyond the middle and attenuated at the apex. Male flagellum with tyloids.

Head.—Cheeks and temples usually moderately narrowed, sometimes more or less inflated; apical border of clypeus often with a minute projection in the middle or slightly bisinuate; sometimes carina oralis elevated; mandibles usually normal, in some genera abbreviated and widened, with strong, subequal, gaping teeth.

Thorax.—Scutellum usually flat, sometimes more or less convex and elevated above the postscutellum; propodeum slanting down backward in a more or less abrupt, rarely gradual slope, the areae dentiparae curved

down usually close to the base of coxae III; apical part of the carina dentipara externa in lateral view not diverging from the apical part of the carina metapleuralis but running parallel, or even converging toward it; apex of area dentipara not forming a prominent corner; basal furrow of propodeum distinct to wide; areolation of propodeum in the overwhelming majority of species complete, except that area basalis and superomedia are sometimes confluent; area superomedia always narrowed or rounded anteriorly, shaped like a horseshoe, gothic arch, semioval or hexagon; the edge between mesopleuron and mesosternum often with a more or less pronounced hump near its apex.

Legs.—Usually moderately stout; coxae III in the female often with a scopa.

Abdomen.—Female abdomen usually strongly oxypygous, in a few genera amblypygous or semiamblypygous; postpetiole usually distinctly aciculate or striate-punctate, sometimes punctate, rarely scabrous or alutaceous; gastrocoeli in the majority of species large and deep, often wider than the space between, rarely of medium size and depth.

Color

Basic color of thorax black or metallic blue, of abdomen black, metallic blue, red, or brown, never with white anal marks, but sometimes with lateral white marks on the anterior tergites.

Sexual dimorphism

Relatively slight, much less pronounced than in the tribe Ichneumonini; white pattern of head, thorax and legs, following the general rule, distinctly more developed in the males than in the females. The basic color of the abdomen, however, the same in both sexes.

Biological characters

Protichneumonini do not feed, as far as known, on Rhopalocera. They do, however, parasitize an amazing variety of different families of Heterocera, attacking almost all of them. In the Holarctic region Protichneumonini have been recorded as parasites of Sphingidae, Arctiidae, Lymantriidae, Notodontidae, Noctuidae, Geometridae, Pyralidae, and even Tortricidae.

In contrast to the Ichneumonini, Holarctic females of this subtribe do not hibernate.

Distribution

The Protichneumonina are a Holarctic group and relatively scarce in tropical climates. They are abundant, however, in higher elevations of tropical mountains, especially in the Himalayan Zone of the Oriental region. Among the Ethiopian fauna so far known to me, only one genus, *Musakia* Strand, can be attributed to this subtribe. The structure of its propodeum is almost identical with that of *Coelichneumon* Thomson, and the basal furrow of the propodeum is distinct.

1. Genus *Musakia* Strand

Fig. 1

Musakia Strand, 1911, Mitt. Zool. Mus. Berlin, V, p. 486.

Type species.—*Musakia arieticornis* Strand.

Holcichneumon Cameron, 1917, Ann. Transv. Mus. II, p. 174-176, new synonymy.

Type species.—*Holcichneumon testaceus* Cameron

Distribution

Tropical and subtropical Africa; recorded from the mountains of Abyssinia in the north to Cape Province (East London) in the south and to Angola and the Cameroons in the west.

Preamble

A typical Ethiopian genus, represented by numerous species, some of which are rather common. It is well distinguished by a number of characters, including structure as well as color. Propodeum (fig. 1) shaped similarly to *Coelichneumon*, the areae dentiparae distinctly curving downward, though not very far, toward base of coxae III; differing from *Coelichneumon*, and from *Afrocoelichneumon* as well by the type of areolation of the propodeum (see below), also (from *Coelichneumon* especially) by the laterally strongly carinate and strongly raised scutellum. Further distinguished by the moderately deepened and moderately large gastrocoeli, sculpture and shape of postpetiole, structure of clypeus and the usually short-petiolate areolet. Abdomen uniformly colored: ferrugionus, yellowish, brown, red, or—in one species—even whitish.

Morphological characters

Flagellum.—Of females always bristle-shaped, distinctly widened and ventrally flattened beyond middle, strongly attenuated toward apex, fairly long. Of males somewhat nodose, with distinct, fairly narrow tyloids.

Head.—Cheeks and temples distinctly narrowed, temple profile slightly curved; vertex steeply declivous from immediately behind ocelli to occipital carina; clypeus basally more or less convex, apico-medially slightly depressed, usually with minute, bipartite, median projection; clypeal foveae small; mandibles normal, fairly slender, upper tooth longer than the lower.

Thorax.—Mesoscutum longer than wide, scarcely convex, notauli indicated only at the very base; scutellum strongly raised above postscutellum, dorsally convex, laterally strongly carinate; propodeum (fig. 1) fairly short, in females horizontal part medially about as long as area posteromedia; areae dentiparae roundly sloping backward, but far from reaching base of coxae III; carination complete; area superomedia essentially hexagonal, usually distinctly longer than wide, with costulae usually inserted before middle, slightly, or not at all, narrowed anteriorly, more distinctly, often rather strongly narrowed toward apex, truncate in front; area basalis usually laterally carinate, always separated from postscutellum by pronounced transverse furrow; sculpture of propodeum, including area superomedia, always rather densely rugose, or rugose-punctate.

Legs.—Fairly stout; femora sometimes very thick.

Wings.—Areolet closed above, usually even short-petiolate.

Abdomen.—Of females moderately slender, oxypygous; petiole gradually widening into postpetiole, the latter dorsally fairly flat, without median field, medially finely longitudinally striate to nearly smooth; gastrocoeli distinctly, but not strongly, deepened and not large, with triangular, or almost quadrangular outline; thyridia distinct; space between gastrocoeli often with short, longitudinal striation; tergites 2 and 3 otherwise densely punctured and subopaque.

Key to the species of *Musakia* Strand

a. Females

1. Abdomen, femora and coxae III ivory-white. (Head and thorax brick-red; tibiae III, tarsi III, and flagellum black; length 14-15 mm.) ..... 8. *semialbida*, new species Ruwenzori Mts.

   Abdomen, femora and coxae III predominantly red, yellow, or brown. 2

2. Thorax almost entirely black; flagellum yellowish-white, orange toward base, apically black. (Head predominantly black; length 15 mm.) ..... 1. *arieticornis* Strand Cameroons

   Sterna entirely, pleura predominantly or entirely yellow or ferruginous; flagellum otherwise colored.[a] 3

3. Mesoscutum with black pattern. 4

   Mesoscutum uniformly ferruginous. 8

4. Mesoscutum with two longitudinal, white or yellow median lines; abdomen red or ferruginous-red. 5

   Mesoscutum without two white median lines; abdomen pale ochreous or yellowish. 6

5. Pronotum medially broadly black from one lateral border to the other; black patch on mesopleura below subalarum; carinae and lateral slopes of scutellum black; last segments of tarsi II and III not infuscated. (Widest segment of flagellum three times as wide as long; length 11-14 mm.) ..... 9. *polyaenoides* (Szépligeti) Tanganyika, Cape Province

   Propleura and mesopleura without black pattern, or at most propleura with restricted black marks; carinae and lateral slopes of scutellum white; last segments of tarsi II and III infuscated. (Widest segment of flagellum only twice as wide as long; length 12.5 mm.) ..... 10. *angolensis*, new species Angola

6. Femora III very thick; mesoscutum only moderately densely and moderately finely punctured, shiny between punctures; widest segment of flagellum three times as wide as long. (Length 14-15 mm.) ..... 2. *testacea* (Cameron) Tanganyika, eastern South Africa

   Femora III distinctly slenderer; mesoscutum more finely and densely punctured, subopaque; widest segment of flagellum 2-2.5 times as wide as long. (Length 15 mm.) 7

7. Only lateral lobes of mesoscutum with longitudinal black bands. ..... 3a. *globulifer globulifer* (Morley) Kenya, Nyasaland, Angola

   All three lobes of mesoscutum with longitudinal black bands. ..... 3b. *globulifer thyridifer* (Morley) Abyssinia

8. Flagellum rather strongly widened beyond middle, the widest segment about three times as wide as long. (Area superomedia usually fairly narrow and longer than wide.) 9

   Flagellum scarcely widened beyond middle, the widest segment about 1.5 to 2 times as wide as long. (Mesoscutum opaque, notauli obsolete.) 10

9. Basal fourth of notauli distinct; postpetiole medially finely aciculate; mandibles not constricted beyond basal third; mesoscutum moderately densely

punctured, somewhat shiny. (Length 13-14.5 mm.) ..... 4. *subtilis* (Szépligeti)
Tanganyika, Kenya

Notauli obsolete; postpetiole medially smooth, not aciculate; about basal third of mandibles rather wide, with subparallel sides; mandibles beyond basal third distinctly constricted, forming a conspicuous emargination on hind margin of mandibles; mesoscutum extremely densely punctured, opaque. (Length 12-13 mm.) ..... 5. *areolator* (Morley)
Uganda, Angola, Liberia

10. Scutellum very strongly raised above postscutellum, dorsally not simply convex, but strongly ascending from base to the rounded, culminating apex, then abruptly declivous toward postscutellum; apical segments of tarsi III infuscated; area superomedia wide, with costulae near to base. (Length 14-16 mm.) ..... 6. *testacecolor* (Morley)
Uganda, Angola, Cameroons, Spanish Guinea

Scutellum but moderately raised, dorsally simply convex; tarsi III pale ferruginous-yellow, their apical segments not infuscated; area superomedia narrower, with costulae near middle. (Length 12 mm.) .....
..... 7. *flavitarsis*, new species
Angola

b. Males

1. Abdomen, femora, and coxae III ivory-white. (Head and thorax predominantly brick-red; tibiae III, tarsi III, and flagellum uniformly black; length 14 mm.) ..... 8. *semialbida*, new species
Ruwenzori Mts.

Abdomen, femora, and coxae III not ivory-white, but either predominantly red or ferruginous, yellow or brown. 2

2. Thorax almost entirely black (hypothetical!). .....
..... 1. *arieticornis* Strand (♂ unknown)
Cameroons

Sterna entirely, pleura predominantly or entirely ferruginous and/or yellow. 3

3. Mesoscutum with black pattern. 4

Mesoscutum uniformly ferruginous. 8

4. Mesoscutum with two longitudinal white or yellow median lines; abdomen red or ferruginous-red. (Basic color of mesoscutum uniformly black or partially red.) 5

Mesoscutum without white median lines; abdomen pale ochreous or yellowish. (Basic color of mesoscutum ochreous with longitudinal black bands on the two lateral, or on all three lobes; flagellum without annulus.) 6

5. Flagellum without annulus; basic color of entire mesoscutum black; tyloids longish-oval; last segments of tarsi II and III not infuscated. (Length 11-14 mm.) ..... 9. *polyaenoides* (Szépligeti)
Tanganyika, Cape Province

Flagellum with white annulus; median lobe of mesoscutum medially, lateral lobes apically extensively red; tyloids narrow, bacilliform; apical segments of tarsi II and III more or less distinctly infuscated. (Length 11 to 14 mm.) ..... 10. *angolensis*, new species
Angola

6. Femora III very thick, distinctly thicker than in alternative species; ocellar region and median band on frons, vertex behind ocelli, and occipital region more or less extensively black; mesoscutum fairly densely punctured, shiny between punctures. (Usually only lateral lobes of mesoscutum with longitudinal black bands, sometimes also median lobe; length 14 to 15 mm.) ..... 2. *testacea* (Cameron)
Tanganyika, eastern South Africa

Femora III somewhat slenderer than in *testacea;* only ocellar region black; mesoscutum more densely punctured than in alternative species, subopaque. 7

7. Only lateral lobes of mesoscutum with longitudinal black bands. .....
..... 3a. *globulifer globulifer* (Morley)
Kenya, Nyasaland, Angola

All three lobes of mesoscutum with longitudinal black bands (hypothetical!) ..... 3b. *globulifer thyridifer* (Morley) (♂ unknown) Abyssinia

8. Flagellum with white annulus; postpetiole medially finely aciculate; basal fourth of notauli distinct. (Tibiae and tarsi III without infuscations; length 14 mm.) ..... 4. *subtilis* (Szépligeti) Tanganyika, Kenya

Flagellum without annulus; postpetiole medially smooth; notauli obsolete. (Tarsi usually blackish-infuscated.) 9

9. Scutellum rather strongly elevated above postscutellum, dorsally simply convex, gradually curved toward base and apex; mandibles beyond the rather broad basal third distinctly and gradually constricted, forming on hind margin before lower tooth a distinct, gradual emargination. (Usually very base of tibiae III infuscated; length 12-13 mm.) ..... 5. *areolator* (Morley) Uganda, Angola, Liberia

Scutellum still more strongly elevated above postscutellum, dorsally not simply convex, but ascending gradually to an rounded summit that is behind the middle, then abruptly declivous toward postscutellum. (Very base of tibia III, usually also lateral fields of horizontal part of propodeum more or less distinctly infuscated; length 14-15 mm.) ..... 6. *testacecolor* (Morley) Uganda, Angola, Cameroons, Spanish Guinea

1. *Musakia arieticornis* Strand

Musakia arieticornis Strand, 1911, Mitt. Zool. Mus. Berlin, V, p. 486, ♀.

Types

Holotype.—♀, "Grosser Kamerunberg, Musake, 1800-2200 m, 6. Oct. 1910, Hintz." Z.M.H.U.

Paratype.—1 ♀, from type locality. Z.M.H.U.

Distribution

Cameroons: high mountain region.

Female

Thorax almost entirely, head predominantly, black; abdomen and legs, including all coxae and trochanters, red-brown; flagellum yellowish-white, pale orange toward base, apex black; length 14 mm.

Flagellum.—Of female bristle-shaped, strongly flattened and widened ventrally beyond middle, with 40 segments. Segments 1-16 whitish, basal segments orange-tinged, segments 17-40 blackish.

Head.—Black; lower parts of face and antennal cavity reddish-brown.

Thorax.—Black; scutella and tegulae reddish-brown. Area superomedia considerably longer than wide, hexagonal, with costulae somewhat beyond middle, narrowed somewhat from insertion of costulae toward front and more strongly toward apex.

Legs.—Red-brown, including coxae and trochanters. Femora diltinctly slenderer than in *testacea* Cameron.

2. *Musakia testacea* (Cameron) ,new combination

Fig. 1

Holcichneumon testaceus Cameron, 1917, Ann. Transv. Mus., II, p. 175/76, ♀.

Types

Holotype.—♀, "Transvaal", with label handwritten by Cameron: "testaceus Cam. type". B.M. No. 3b-245.

Neallotype.—♂, Transvaal, Pietermaritzburg, 12.II.1963, leg. G. Heinrich. C.G.H. II.

Distribution

Eastern South Africa from Natal, Zululand (S.A.M.), Pietermaritzburg (holotype and C.G.H. II.) and Durban (C.G.H. II.) to East London (C.G.H. II.); also north Tanganyika, Mt. Meru, 1500 m, and south Tanganyika, Mbeya (C.G.H. II.).

Preamble

This species and the following, *globulifer* (Morley), are chromatically distinguished by pale-ochreous to yellowish basic color, with longitudinal black bands on lateral lobes of mesoscutum. They are extremely similar, differing mainly, and fairly strongly, in the shape of femora III, slightly in sculpture of mesoscutum and, in females, also in flagellar proportions.

Female

Pale ochreous, pleura, sterna, prepectus, anterior coxae, and most of head yellow; lateral lobes of mesoscutum with longitudinal black bands, sometimes also median lobe anteriorly black; ocellar region more or less distinctly infuscated; apical border of femora III, base of tibiae III narrowly, inner side of tibiae III, and the tarsi III distinctly infuscated; flagellum black with white annulus; length 15 mm.

Flagellum.—Moderately long, bristle-shaped, fairly strongly widened beyond middle, with 39-41 segments, the first nearly three times as long as wide, the eleventh approximately square, the widest about three times as wide as long. Black, with dorsal white annulus on segments 8 (apex) to 14 or 15, or (exceptionally) 16; basal segments ventrally and narrowly around apex and the flattened ventral part beyond middle brownish; scape ferruginous.

Head.—Clypeus basally distinctly convex, apically depressed, medioapically with two minute, projecting tubercles. Ochreous; ocellar region more or less strongly infuscated; face, clypeus, cheeks, frontal orbits, and base of mandibles yellow.

Thorax.—Area superomedia with costulae at or beyond middle, scarcely narrowed toward base, strongly narrowed toward apex; mesoscutum fairly densely punctured, shiny between punctures; scutellum shiny, sparsely punctured. Ochreous; pleura, sterna, and prepectus yellow; longitudinal black bands on lateral lobes of mesoscutum, sometimes also anterior part of median lobe extensively black; black bands on lateral lobes surrounded by a more or less distinctly yellowish band.

Legs.—Moderately stout, femora III rather thick and wide in dorsal view, as well as in lateral. Ochreous; coxae and trochanters I and II yel-

lowish; the following infuscated: apical border of femora III, base of tibiae III narrowly, their tip and inner side more or less extensively, usually over the whole length.

Wings.—Areolet quadrangular, closed above, but not petitolate.

Abdomen.—Postpetiole medially very finely, sometimes indistinctly, longitudinally striate, laterally irregularly punctured; tergites 2 and 3 very densely and evenly rugose-punctate, subopaque. Uniformly ochreous.

Male

Basic color ligther than in female, more yellowish; flagellum dorsally black, without annulus; black pattern on head, mesoscutum and tibiae III somewhat more extensive than in female; length 14-15 mm.

Flagellum.—With 39 segments and narrow, bacilliform tyloids on segments 9 or 10 to 17 or 18. Dorsally black, ventrally brownish; scape ventrally yellowish, dorsally more or less infuscated.

Head.—Yellowish; the following black: ocellar region, median longitudinal band on frons reaching down nearly to antennal base, vertex behind ocelli and occipital region more or less extensively.

Thorax.—Yellowish; longitudinal black bands on lateral lobes of mesoscutum and usually a black patch on anterior part of median lobe, often a full longitudinal black band also on median lobe.

Legs.—Black or blackish are: apical margin of fomora III, tibiae III predominantly, usually except one longitudinal yellowish line on dorsal and another on ventral side, tarsi III.

Abdomen.—More yellowish than in female.

3. *Musakia globulifer* (Morley), new combination

Distribution

Nyasaland, Angola, Kenya, Abyssinia.

Preamble

This form is almost identical with *testacea* Cameron, except for the femora III which are distinctly slenderer. In the male the black coloration on the head is restricted to the ocellar region alone, and the tibiae III are somewhat less infuscated in both sexes. Two additional differences from *testacea* Cameron are rather subtle: the puncturation of the mesoscutum is somewhat finer and denser, and the female flagellum is a trifle less widened, the widest segment being about two to two and half times wider than long, instead of three times.

It seems possible that *globulifer* is the Central African vicariant of *testacea*, however, the occurrence of the latter in Tanganyika makes this hypothesis doubtful. We need a more complete and detailed knowledge of the distribution of the two forms before a safe conclusion about the taxonomic status of *globulifer* can be drawn.

Female

Pale ochreous; pleura sterna, prepectus, anterior coxae, and most of head yellowish; lateral lobes, in ssp. thyridifer *Morley also median lobe,*

of mesoscutum with longitudinal black band; ocellar region distinctly infuscated; base of tibiae III narrowly, inner side of tibiae III slightly, and the tarsi III infuscated; flagellum black, ventrally brownish at base, with white annulus; length 15 mm.

Male

Flagellum black, without annulus; otherwise colored as the female; length 15 mm.

3a. *Musakia globulifer globulifer* (Morley)

Coelichneumon globulifer Morley, 1919, Proc. Zool. Soc. London, p. 142, ♂.
Musakia bilineata Heinrich, 1935, Mission Scientif. de l'Omo, III, p. 236, ♀, new synonymy.

Types

Holotypes.—*Coelichneumon globulifer* Morley, ♂, "Nyasaland, Kibuezi, 3000 ft, April 2-4, 1911, S.A. Neave." B.M. No. 3b-247. *Musakia bilineata* Heinrich, ♀, "Kenya, Nairobi, A. Seyrig, 10.VI.1932." C.G.H. I.

Allotype.—*Musakia bilineata* Heinrich, ♂, "Kenya, Nairobi, A. Seyrig, 10.VI.1932." C.G.H. II.

Distribution

Nyasaland (type locality); Kenya; Angola, Amboiwa (C.G.H. II.).

Female and *Male*

Median lobe of mesoscutum without black band.

3b. *Musakia globulifer thyridifer* (Morley), new combination

Coelichneumon thyridifer Morley, 1919, Proc. Zool. Soc. London, p. 143, ♀.

Types

Holotype.—*Coelichneumon thyridifer* Morley, ♀, "Harrar, Abyssinia, R.E. Turner." B.M. No. 3b-250.

Distribution

Abyssinia.

Female

All three lobes of mesoscutum with longitudinal black bands.

Note:

The constancy of the black band on the median lobe of mesoscutum, and with it the justification of this subspecies, needs confirmation.

4. *Musakia subtilis* (Szépligeti)

Fig. 2

Hoplismenus subtilis Szépligeti, 1910, Sjöstedt's Kilimanjaro-Meru Expedition, 8, p. 57, ♂.

Musakia subtilis Heinrich, 1935, Mission Scientif. de l'Omo, III, pp. 235/36, ♀♂, descriptive notes; Kenya, Nairobi.

Types

Holotype.—♂, "Kilimandjaro, Sjöstedt, Kibonoto Kulturzone, 7. Mai." N.R.

Neallotype.—♀, "Kenya, Nairobi, A. Seyrig, 10.VI.32." C.G.H. I.

Distribution

North and east Tanganyika: Kilimanjaro (type locality), Uluguru Mts., 1500 m.; Lake Manyara, Escarpment, 1200 m. (C.G.H. II.); south Tanganyika, Mbeya, 2000 m. (C.G.H. II.); Kenya, Nairobi (C.G.H. I.).

Preamble

This is one of at least three extremely similar, uniformly ferruginous species which inhabit the tropical forests of Africa. It seems to be confined to the eastern part of the continent, and is distinguished from the other two known species of the same color, by the following characters: in both sexes, by (1) the distinctly, though not very strongly, longitudinally striate median field of postpetiole, (2) the entire lack of infuscation on tibiae and tarsi III, (3) the sculpture of mesoscutum, which is less densely punctured than in the other species and distinctly shiny between punctures instead of wholly opaque, (4) the distinct anterior fifth of notauli. The flagellum of male bears a narrow dorsal white annulus, and the flagellum of females is distinctly widened.

Male

Uniformly ferruginous; no infuscation on tibiae III or tarsi III; clypeus, face, sterna, pleura, and anterior coxae and trochanters extensively yellowish; flagellum with dorsal white annulus on segments 15 or 16 to 17 or 18, black; ocellar region sometimes (type) infuscated; length 14 mm.

Flagellum.—With 39 segments and with bacilliform tyloids on segments 9-17. Black, with dorsal white annulus on segments 15 or 16 to 17 or 18, ventrally ferruginous, scape ferruginous, ventrally yellowish.

Head.—Ferruginous; the following yellowish: mandibles (except teeth), clypeus, face, frontal orbits, cheeks; ocellar region usually scarcely, in type distinctly, infuscated.

Thorax.—Mesoscutum but moderately densely punctured, with distinct intervals between punctures and fairly shiny; basal fifth to fourth of notauli distinct; area superomedia comparatively small, from about as long as wide to distinctly longer than wide. Ferruginous; the following yellowish: sterna, prepectus, mesopleura partially.

Legs.—Femora III fairly stout. Ferruginous; coxae and trochanters I and II yellowish.

Wings.—Areolet very short-petiolate. Wings in Kenya specimens slightly grayish infuscated.

Abdomen.—Middle of postpetiole finely longitudinally striate; sides sparsely punctured. Ferruginous.

Female

Uniformly ferruginous; no infuscation on tibiae and tarsi III; yellowish are: face, clypeus, sterna, pleura, and anterior coxae and trochanters;

flagellum black with white annulus, base at least ventrally brownish; length 13-14.5 mm.

Flagellum.—Moderately long, bristle-shaped, fairly strongly widened beyond middle, with 38-41 segments, the first more than three times as long as wide, the fourteenth approximately square, the widest fully three times as wide as long. Black with white annulus on segments 8 or 9 to 14 or 15, ventrally predominantly brown, usually the first segments also dorsally brownish.

5. *Musakia areolator* (Morley), new combination

Fig. 3

Xanthojoppa areolator Morley, 1919, Proc. Zool. Soc. London, p. 133, ♂.

Types

Holotype.—♂, "Mabira Forest, Chagwe, 17.-20.VII.1911, Uganda, C.C. Gowdey". B.M. No. 3b-246.

Neallotype.—♀, "Angola, 30 km. W. of Quiculungo, Sept./Okt. 1957". C.G.H. II.

Distribution

Uganda (type locality); Angola (C.G.H. II.); Liberia (U.S.N.M.).

Preamble

One of the four extremely similar, uniformly light-ferruginous species of the *subtilis* group. Fairly easy to distinguish from the other three species by structure of mandibles (fig. 3), a character to which Dr. J. F. Perkins has kindly drawn my attention. In females, about the basal third of mandibles is rather wide and approximately parallel-sided; mandibles behind the basal third fairly abruptly constricted and thus their hind margin before the lower tooth conspicuously concave. In males this character is less pronounced, but still recognizable. Females differ besides from *testacecolor* Morley by considerably more widened flagellum, from *subtilis* Szépligeti by obsolescence of notauli and lack of aciculation on postpetiole, from *flavitarsis*, new species, by the widened flagellum.

Dr. J. F. Perkins was kind enough to compare one of my female specimens from Angola with the holotype and confirmed that—with high probability—these were the sexes of one species. Whether or not the West African populations of this species are subspecifically differentiated from the Uganda populations can not be stated until females from the type locality are available for comparison.

Male

Very similar to the male of *testacecolor;* distinguished from it only by the structure of mandibles and of scutellum.

Uniformly ferruginous; usually very base of tibiae III, the tarsi III, and ocellar triangle blackish infuscated; face, clypeus, cheeks, sterna, and anterior coxae yellowish; flagellum without annulus; length 12-13 mm.

Flagellum.—Elongate tyloids on segments 10-18, the longest on segments 13-15 almost reaching to apices of segments, but not to bases. Black, segments of basal part ventrally ferruginous, dorsally black-brown.

Head.—Frons almost smooth: V-shaped wrinkles below ocellar triangle scarcely indicated; special structure of mandibles as described in preamble, but less pronounced than in female. Ferruginous; face, clypeus, cheeks and mandible base pale yellowish.

Thorax.—Notauli obsolete, only their very base indicated by a small impression; mesoscutum very densely punctured, subopaque, scutellum fairly strongly elevated above postscutellum, but not quite as strongly as in *testacecolor*, its surface normally convex, curving down to base and apex; area superomedia longer than wide, clearly separated behind from area posteromedia, with costulae close to middle; area basalis not strongly declivous toward basal furrow of propodeum. Ferruginous; sterna yellowish tinged.

Legs.—Ferruginous; anterior coxae pale yellowish; usually very base of tibiae III and always the tarsi III blackish infuscated.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole apico-medially smooth, laterally punctate, basally indistinctly longitudinally rugose. Uniformly ferruginous.

Female

The following description of the female is based on a series of four females from Angola and one from Nigeria.

Uniformly ferruginous; very base of tibiae III infuscated; clypeus, face, cheeks, sterna, mesopleura, and anterior coxae yellowish; flagellum black, with white dorsal annulus, its basal part at least ventrally ferruginous; length 12-13 mm.

Flagellum.—With 39 or (usually) 40 segments; the first 3.5 times as long as wide, the widest three times as wide as long. Black, the basal part to near the annulus dorsally blackish-brown, ventrally ferruginous; dorsal white annulus on segments 8 or 9 to 14 or 15; scape ferruginous.

Head.—Frons almost smooth, not, or very indistinctly, wrinkled: for special structure of mandibles see preamble. Ferruginous; face, clypeus, cheeks, and mandible base pale yellowish.

Thorax.—As in the male; area superomedia, on the average, narrower and considerably longer than wide. Ferruginous; sterna and mesopleura pale yellowish tinged.

Legs.—Ferruginous, anterior coxae and trochanters pale yellowish; very base of tibiae III and sometimes the last segment of tarsi III infuscated.

Abdomen.—Postpetiole smooth, laterally punctate. Uniformly ferruginous.

Remark

In the only known specimen from Nigeria the parts described above as "pale yellowish" are almost white, and the tarsi III are infuscated.

6. *Musakia testacecolor* (Morley), new combination

Fig. 4

Cratichneumon testacecolor Morley, 1919, Proc. Zool. Soc. London, p. 153, ♀.

Types

Holotype.—♀, "Uganda, Budongo Forest, Unyoro, 3400 ft, 11.-15. Dec. 1912, S.A. Neave". B.M. No. 3b-248.

Neallotype.—♂, "Roça Canzele, Angola, 30 km north of Quiculungo, III.1954". C.G.H. II.

Distribution

Uganda (type locality); Spanish Guinea, Cameroons (Z.M.H.U.); western Angola (C.G.H. II.).

Preamble

The third species of the *subtilis* group and very similar to *areolator* Morley; best distinguished from the latter, in both sexes, by structure of scutellum, mandibles, and shape of area superomedia; females also by the flagellum which is scarcely widened beyond middle. Scutellum elevated higher above postscutellum than in any of the other species of the *subtilis* group, and dorsally not evenly convex, but ascending gradually from base to an elevated, rounded summit that is behind the middle, and then abruptly and steeply declivous to the postscutellum; mandibles (fig. 4) without the nearly parallel-sided, wide basal third and the following conspicuous, curved constriction, but gradually narrowed from slightly beyond base, the concavity of the lower margin of mandibles thus much slighter and more gradual than in *areolator* Morley; area superomedia receiving costulae close to base, apically only exceptionally separated by a distinct carina from area posteromedia, basally comparatively much wider—on the average—than in *areolator*, the area basalis shorter and declivous into basal furrow of propodeum. In contrast to *areolator*, in females, apical segments of tarsi III usually infuscated, the very base of tibiae III, however, not so.

Female

Uniformly ferruginous; the last 3-4 segments of tarsi III (exceptionally all 5 segments) infuscated; clypeus, face, cheeks, sterna, and lower part of pleura yellowish tinged; flagellum with white annulus; length 14-16 mm.

Flagellum.—Usually with 40 segments, the first fully 3.5 times as long as wide, the widest 1.5 times as wide as long. Black, with dorsal white annulus on segments 8 (apex) or 9 to 15 or 16 (base); about 4 or 5 basal segments ventrally light ferruginous, dorsally dark brownish; scape light ferruginous.

Head.—Mandible as described in preamble; frons below ocellar triangle with usually rather distinct V-shaped, parallel wrinkles. Light ferruginous; mandibles (except teeth), clypeus, face, cheeks, and frontal orbits pale yellowish.

Thorax.—Notauli obsolete, indicated only at the very base by a small impression; mesoscutum very densely punctured, opaque; scutellum as described in preamble, strongly and densely punctured; area superomedia as described in preamble. Uniformly ferruginous; sterna and lower part of pleura pale yellowish.

Legs.—Ferruginous, tarsi III infuscated (at least the last 3 segments); no infuscation on base of tibiae III; coxae and trochanters I and II yellowish.

Wings.—Slightly yellowish; areolet quadrangular.

Abdomen.—Postpetiole basally with a few scattered punctures, laterally densely punctured, the entire median part almost smooth. Uniformly ferruginous.

Male

Uniformly ferruginous; tarsi III blackish; usually also very base of tibiae III on both sides and the lateral fields of the horizontal part of propodeum more or less intensely infuscated; clypeus, face, cheeks, sterna, and lower part of pleura yellowish; flagellum predominantly black, without annulus; length 14-15 mm.

Flagellum.—With elongate, narrow tyloids on segments 9 or 10 to 17 or 18. Black, ventrally ferruginous to beyond middle; a few basal segments dorsally indistinctly brownish; scape ferruginous.

Head.—Frontal wrinkles, on the average, less distinct than in female. Otherwise like female.

7. *Musakia flavitarsis*, new species

Types

Holotype.—♀, "Angola, 30 km north of Quiculungo, Sept./Okt. 1957". C.G.H. II.

Distribution

Northwest Angola.

Preamble

The fourth species of the *subtilis* group, so far known only from the type specimen, shares the slenderer, scarcely widened flagellum of the female with *testacecolor* Morley, but the moderately raised, dorsally evenly convex scutellum with *areolator* Morley and with both, the densely punctured, opaque mesoscutum with obsolete notauli; by the latter character, and the smooth median part of postpetiole, it differs clearly from *subtilis* Szépligeti, by the slenderer flagellum and normal mandibles from *areolator* and by the lower scutellum from *testacecolor;* differing besides from all three species by the light yellowish color of entire tarsi III.

Female

Uniformly light ferruginous; no infuscation on tibiae or tarsi III; the latter uniformly pale yellowish-ferruginous; clypeus, face, cheeks, sterna and lower part of pleura yellowish; flagellum with white annulus; length 12 mm.

Flagellum.—With 35 segments, the first about 3.5 times as long as wide, the widest nearly twice as wide as long. Black, with white, dorsal annulus on segments 8 (apex) to 14; basal segments ventrally ferruginous, dorsally indistinctly brownish; scape ferruginous.

Head.—Mandibles without distinct constriction and not conspicuously concave on hind margin before lower tooth; frons almost smooth, with

vestiges of V-shaped wrinkles. Light ferruginous; mandibles (except teeth), clypeus, face, and cheeks yellowish tinged; ocellar triangle slightly infuscated.

Thorax.—Mesoscutum as described in preamble; scutellum only moderately raised above postscutellum, dorsally simply convex and rather densely and coarsely punctured; area superomedia longer than wide, subparallel-sided, with the costulae slightly before middle, not quite clearly separated from area basalis. Light ferruginous; sterna and lower part of pleura yellowish tinged; lateral fields of horizontal part very slightly infuscated.

Legs.—Light ferruginous; anterior coxae and trochanters yellowish; tibiae and tarsi III without infuscation, the latter light-colored, faintly yellowish tinged.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally punctate, medially smooth. Uniformly light ferruginous.

Remark

One female from "Westafrika, Uelleburg" (Z.M.H.U.) agrees in all essential characters with the type of this species, but has the femora III distinctly stouter. It may represent a subspecies, or a distinct species. In view of the lack of material sufficient for clarifying its status, it has not been treated in this paper.

8. *Musakia semialbida*, new species

Types

Holotype.—♀, "Nördl. von Alb. Edw. See, Ruwenzori, Westseite, 2500 m,. 2.08." Z.M.H.U.

Allotype.—♂, same locality and data. Z.M.H.U.

Distribution

Ruwenzori Mts.

Preamble

An unmistakable, unsually colored species, combining a whitish abdomen, whitish femora and coxae III with brick-red head and thorax.

Female

Head and thorax almost uniformly brick-red; abdomen and legs III, including coxae, whitish; tibiae and tarsi III black; legs I and II ferruginous, the tarsi II infuscated; flagellum black, without annulus; length 15 mm.

Flagellum.—Bristle-shaped, moderately long, strongly widened beyond middle, with 41 segments, the first fully three times as long as wide, the eleventh square, the widest three times as wide as long. Black, without annulus; scape red, ventrally yellowish.

Head.—Brick-red; mandibles (except teeth) yellow; clypeus and lateral fields of face slightly yellowish.

Thorax.—Notauli basally indicated; mesoscutum rather densely punctured, subopaque; scutellum moderately raised above postscutellum, shiny,

with scattered punctures; area superomedia longer than wide, costulae inserted beyond middle. Brick-red; sterna yellowish.

Legs.—Legs III, including coxae and trochanters, white, their tibiae and tarsi black; legs I and II ferruginous, their coxae yellowish; tarsi II moderately infuscated.

Wings.—Slightly grayish infuscated; areolet short-petiolate.

Abdomen.—Middle of postpetiole apically smooth, basally with vestiges of aciculation. Uniformly whitish.

Male

Head and thorax predominantly brick-red, with restricted black pattern; face and clypeus whitish; abdomen whitish, the last tergites partially and slightly reddish infuscated; legs exactly as in female; flagellum black, without annulus; length 14 mm.

Flagellum.—With 38 segments, bacilliform, fairly long tyloids on segments 10-17. Black, scape red, ventrally yellowish.

Head.—Red; ocellar region and middle of frons down to antennal base broadly black; the following yellowish-white: mandibles (except teeth), clypeus, face, malar space.

Thorax.—Mesoscutum as in female; scutellum more densely punctured and more strongly raised above postscutellum, also on dorsal side, the dorsal surface ascending distinctly from basal furrow toward the elevated apex. Red; sterna and lower part of mesopleura and metapleura yellowish-white; black pattern on propodeum, covering the apical parts of areae dentiparae and the areae posteroexternae.

Legs and *wings.*—As in female.

Abdomen.—As in female, the apical tergites, however, beginning from the apex of fourth tergite increasingly and somewhat irregularly reddish infuscated.

9. *Musakia polyaenoides* (Szépligeti), new combination

Hoplismenus polyaenoides Szépligeti, 1910, Sjöstedt's Kilimanjaro-Meru Expedition 8, p. 59, ♀.

Types

Lectotype.—♀, "Kilimandjaro—Sjöstedt, 1905-6, 2. Jan., Obstgartensteppe". N.R. Designated by Heinrich 1963.

Neallotype.—♂, "Tanganyika, Uluguru Mts., 700 m, 9.I.1962". C.G.H. II.

Distribution

North and east Tanganyika: Kilimanjaro (type locality), Mt. Meru, 1500 m, and Uluguru Mts., 700 m. (C.G.H. II.); also South Africa, East London (C.G.H. II.).

Preamble

By the less elevated scutellum, the stronger sculpture of anterior tergites and the smoother sculpture of mesoscutum and scutellum, also chromatically by the rich white pattern of head and thorax, this species differs

distinctly from all the preceding species of the genus. See also remark at the end of this description.

Female

Head white, with black pattern; mesoscutum black, median lobe blood-red, with short white median lines; scutella white; abdomen uniformly, legs predominantly light red; flagellum black with white annulus; length 11 to 14 mm.

Flagellum.—Fairly short, bristle-shaped, strongly widened beyond middle, with 37-40 segments, the first about 2.5 times as long as wide, the ninth approximately square, the widest fully three times as wide as long. Black, with white dorsal annulus from segments 8 or 9 to 15 or 16; basal segments at apices narrowly, and often ventrally more extensively, brownish; scape ventrally ferruginous, dorsally infuscated.

Head.—Clypeus basally but slightly convex, distinctly less so than in all the preceding species, with small apico-median projection; malar space only about half as long as width of mandible base. White; median field of face usually pale ferruginous; the following black: ocellar region, vertex behind it, entire occipital region and middle of frons broadly down to antennal cavities; the black frontal band is usually medially divided by a narrow red band which runs from the lower ocellus down into the middle of antennal depression.

Thorax.—Mesoscutum and scutellum, in contrast to all preceding species, shiny, with very sparse punctation, the former very finely coriaceous; area superomedia with costulae beyond middle, distinctly narrowed from costulae toward area basalis and usually not clearly separated from the latter; scutellum less raised above postscutellum than in all the preceding species, dorsally only moderately convex, the lateral carinae strong; notauli distinct only at base. Pale ferruginous, dorsally extensively black, with rich white pattern and blood-red median lobe of mesoscutum; the following black: lateral lobes of mesoscutum, middle of pronotum broadly, patch below subalarum, carinae and lateral slopes of scutellum, areae superoexternae and dentiparae, sometimes also areae posteroexternae; the following white: collare, pronotal ridge and base broadly, two short median lines on mesoscutum, subalarum, scutella; the following whitish-yellow: sterna medially, or more extensively, prepectus partially, lower part of propleura and mesopleura, sometimes patch on area of speculum, all median areae of propodeum.

Legs.—Light red, coxae and trochanters I and II paler.

Wings.—Clear; areolet quadrangular.

Abdomen.—Median field of postpetiole and space between gastrocoeli clearly longitudinally striate; second and third tergites densely rugose-punctate. Uniformly light red.

Male

Head white, with black pattern; mesoscutum black, including median lobe, with short white median lines; abdomen uniformly, legs predominantly, light red; flagellum black, without annulus; length 11-14 mm.

Flagellum.—With 37-39 segments and longish-oval tyloids on segments 8 or 9 to 14 or 15. Black, including scape, the latter ventrally white.

Head.—Malar space one-third as long as width of mandible base; basal swelling and apical depression of clypeus scarcely indicated. Color as in female, except that the black color of occipital region usually extends onto temples wider toward borders of eyes, and that the median red line on the black frontal band is lacking.

Thorax.—Areae superoexternae less densely punctured than in female, usually predominantly smooth; anterior part of area superomedia usually not distinctly limited. Black color more extensive than in female, including additionally: the median lobe on mesoscutum and often the areae posteroexternae on propodeum; sterna and lower part of mesopleura more extensively and clearly whitish or white; otherwise as in female.

Legs and *wings.*—As in female.

Abdomen.—Median field of postpetiole on the average less distinctly striate than in female, striation often obsolete. Otherwise as in female.

Remark

This species and the following differ from typical *Musakia* species chromatically as well as in somewhat stronger sculpture of anterior tergites, and also by the carination of the propodeum in that the areae superomedia and basalis are nearly confluent, the anterior border of the former being usually rather indistinct. In all these characters the two species approach the new genus *Coelapatetor,* described further on in this paper. They have, however, the narrowed mandibles of *Musakia,* with small, not-at-all-gaping subapical tooth, and also the clypeus features of this genus, with slightly convex base and small medio-apical projection. As the gastrocoeli are also fairly small and shallow, as in *Musakia,* they may be placed in this genus rather than in the other.

10. *Musakia angolensis,* new species

Types

Holotype.—♀, "Angola, südl. Gabela, 4.VIII.1954". C.G.H. II.
Allotype.—♂, same locality and date. C.G.H. II.
Paratypes.—3♂♂, Angola, Quitondo, distr. Calulo, 11.VIII.-2.IX.1957. C.G.H. II.

Distribution

Angola, south of the Cuanza river: Gabela (type locality), Quitondo, district Calulo (C.G.H. II.).

Preamble

In color and structure closely related to *polyaenoides* Szépligeti and perhaps the western vicariant of the latter species. Differs from it chromatically in both sexes by restriction of black pattern on thorax which is usually entirely lacking on pleura, and by more or less extensive infuscation of tarsi II and III. Besides, in males flagellum with white annulus and tyloides narrower, in females flagellum distinctly less widened beyond middle.

Female

Head white, with black pattern; mesoscutum black, median lobe and apical half of lateral lobes red, the former with yellow median lines, the

latter with short lateral yellow line; scutella white; abdomen uniformly, legs predominantly light red, the last 2-3 segments of tarsi II and III infuscated; flagellum black with white annulus; length 12.5 mm.

Flagellum.—Moderately short, bristle-shaped, slightly widened beyond middle, with 37 segments, the first about 2.5 times as long as wide, the 10th approximately square, the widest twice as wide as long. Black, with dorsal white annulus on segments 8 (apex) to 16; basal segments at apices narrowly and ventrally entirely brownish; scape ventrally yellowish, dorsally blackish-brown.

Head.—As in *polyaenoides:* clypeus basally only slightly convex; malar space about half as long as width of mandible base. White, including median field of face; black are only: ocellar region, a small area on frons below it, vertex behind it, occipital region, two dots in the middle of frons, and a mark in the middle of each antennal cavity.

Thorax.—Mesoscutum and scutellum as in *polyaenoides:* shiny and sparsely punctured, scutellum but moderately raised above postscutellum, dorsally moderately convex, laterally strongly carinate; area superomedia with costulae beyond middle, not distinctly separated from area basalis. Pale ferruginous, including central areae of horizontal part of propodeum; mesoscutum vivid red, with base and apex of central lobe and anterior half of lateral lobes black; areae superoexternae and dentiparae predominantly blackish; the following pale yellow: collare, pronotal base and ridge, two longitudinal median stripes on mesoscutum, a short lateral line on each side of mesoscutum, scutellum including carinae and lateral slopes, postscutellum, subalarum, an indistinct mark on area of speculum.

Legs.—Pale ferruginous; segments 3-5 of tarsi II and III infuscated.

Wings.—Clear; areolet quadrangular.

Abdomen.—Median field of postpetiole and space between gastrocoeli longitudinally striate; second and third tergites densely rugose-punctate. Uniformly ferruginous.

Male

Head white with black pattern; mesoscutum black, median lobe medially and lateral lobes apically extensively red, the former with two median longitudinal yellow stripes, the latter with a short yellow lateral stripe; abdomen uniformly ferruginous; legs of the same color, except for the three apical segments of tarsi II and III, and the very base of tibiae III which are more or less distinctly infuscated; flagellum black with white annulus; length 11-14 mm.

Flagellum.—With 34-37 segments and with narrow, bacilliform tyloids on segments 9 or 10 to 15 or 16. Black, including scape, ventrally indistinctly brownish, scape ventrally white, with complete white annulus on segments 12 (apex) to 18 or 19 (base).

Head.—As in *polyaenoides:* basal swelling and apical depression of clypeus scarcely indicated. Color as in female, except that the black color on ocellar region continues as a broad, black band down the middle of frons nearly to the very base of antennae.

Thorax.—Areae superoexternae much less densely punctured than in female, smooth, with a few coarse punctures; carination of anterior part of area superomedia subobsolete. Color generally as in female, but sometimes

one or two black patches on anterior part of propleura, and/or the base of median lobe of mesoscutum and the apices of all lobes somewhat more extensively black; areae superoexternae in one specimen without blackish patch; sterna and most of propleura and mesopleura pale yellowish.

Legs.—Pale ferruginous; at least three apical segments of tarsi II and III, and usually also the very base of tibiae III, particularly laterally, infuscated; sometimes entire tarsi III infuscated.

Abdomen.—As in female.

I. B. Subtribe *Apatetorina*, new subtribe

This subtribe agrees in the majority of characters with the subtribe Protichneumonina, differing mainly in the structure of the propodeum (fig. 6).

Morphological characters

Thorax.—The horizontal part of the propodeum more elongate, the declivity usually distinctly to much shorter than the fused areae superomedia and basalis; areae dentiparae more gradually sloping downward toward base of coxae III with the tendency to become confluent apically with the areae posteroexternae; area superomedia confluent with area basalis and often indistinctly or not at all separated from the area posteromedia, thus forming one very long central area which is often parallel-sided, or gradually narrowed from base to apex, sometimes widened at costulae; this central area tends to project anteriorly in the middle or in its whole width toward postscutellum, becoming often directly contiguous to the latter and making the basal furrow of propodeum medially or entirely obsolete.

Color

In contrast to the Protichneumonina, restricted white anal markings are almost the rule; in Africa, head and thorax bear usually rich white markings, the basic color of mesoscutum is frequently blood-red; the prevailing basic colors of the abdomen are black, chestnut-red, ferruginous and intermediate shades.

Distribution

It seems that the Apatetorina have reached the highest degree of diversification in the Ethiopian tropics. In a parallel to the tribe Compsophorini they also occur, though in a more restricted number of forms, in the Oriental tropics. They are well represented in the Neotropical region, from which I have described the genus *Neotropichneumon*, which evidently belongs to this subtribe.

Taxonomic remark

From the morphological point of view, the propodeal structure of this subtribe seems to be less specialized than in the Protichneumonina, as the abbreviation of the propodeum and its longitudinal compression, started in the Protichneumonina and completed in the Trogina, is scarcely indicated in the Apatetorina. Thus the taxonomic position of this subtribe is arbitrary. It stands morphologically between the two tribes Protichneumonini and Ichneumonini, and could almost with equal right be placed in either of

them. In 1938, I included *Apatetor* in the Ichneumonini. In the meantime I have become acquainted with a number of related forms and genera from the Ethiopian continent, some of which clearly approach the Protichneumonini very closely. Consequently I have now included the entire group in that tribe.

2. Genus *Apatetor* Saussure

Apatetor Saussure, 1890, in Grandidier, Hist. Phys. Nat. Polit. de Madag., XX, pl. XVI, fig. 7 and 7a; figures only, no description.

Apatetor Heinrich, 1938, Mém. Acad. Malg., XXV, p. 55-56; description; also figs. 34, 44, 27: propodeum, tergites 1-2, scutellum.

Type species.—*Apatetor blandus* Saussure, monobasic.

Preamble

My original conception of this genus, as applied in 1938 in its first treatment, I regard today as too vague. Considering the numerous related forms from the African continent I have examined since, I believe that we are dealing here with a number of well differentiated genera which, however, all agree in one character: the fusion of area basalis and superomedia, often also of area posteromedia, forming one long central area of propodeum (fig. 6).

In the following, I shall include in the genus *Apatetor* only species distinguished by the combination of the following 5 characters, in addition to the propodeal feature mentioned above:

1. Mandibles normal, slender, with small subapical tooth not separated from the pointed apical tooth by a wide gap.
2. Postpetiole without distinct median field, finely sculptured, almost smooth, or at the most with some indistinct striation.
3. Gastrocoeli small and shallow.
4. Basal furrow of propodeum between postscutellum and area centralis present.
5. Scutellum not, or slightly raised above postscutellum, lateral carination distinct to obsolete.

Morphological characters

Flagellum.—Of females bristle-shaped, ventrally flattened and distinctly widened beyond middle, moderately attenuated at apex; of males somewhat nodose by transverse bristle ridges on ventral side of segments (nodosity sometimes made still more pronounced by slight ventro-basal concavity of a number of subbasal segments); tyloids small, bacilliform or sometimes obsolete.

Head.—Temples and cheeks moderately narrowed, temple profile with slightly curved outline; median field of face somewhat raised; clypeus slightly convex basally, its apical border straight, usually with minute median projection and with slight median subapical concavity; mandibles normal, slender, with long, pointed apical tooth and small subapical tooth, not widely divergent.

Thorax.—Basal part of notauli distinct; mesoscutum very finely coriaceous, not, or sparsely and finely, punctured; scutellum fairly long, flat, or slightly convex dorsally, laterally carinate or not carinate, apically not or scarcely raised above postscutellum; declivity of propodeum distinctly

shorter than horizontal part, the latter fairly long; areae dentiparae moderately curved downward apically and usually not clearly separated from areae posteroexternae; central area frequently a little widened at costulae, sometimes elongate and parallel-sided, not projecting toward postscutellum.

Legs.—Fairly stout; coxae III of females without scopa.

Wings.—Clear; areolet quadrangular.

Abdomen.—Of females oxypygous; petiole gradually widened into postpetiole, the latter moderately convex, without median field, almost smooth, sometimes with vestiges of aciculation; the following tergites very finely coriaceous, without striation or distinct punctation, nearly smooth; gastrocoeli small and shallow; hypopygium of males close to truncate, but slightly projecting medially in a very obtuse angle.

Distribution

This genus in its more restricted definition discussed above is evidently confined to the island of Madagascar where it is represented by a number of closely related forms. Among the genera known so far from the Ethiopian continent, *Coelapatetor*, new genus, is probably most closely related to *Apatetor*. It differs from the latter mainly by large and deep gastrocoeli and strong aciculation of postpetiole and anterior tergites.

Key to the species of *Apatetor* Saussure

a. Females

1. Tarsi III ferruginous or brown, sometimes infuscated, never predominantly whitish. 2
   Tarsi III predominantly whitish. 5
2. Central area of propodeum black; flagellum only moderately widened beyond middle, the widest segment 2-2.5 times wider than long; smaller species of 11 mm. length. (In holotype, first and base of second tergite black, often basic color of abdomen uniformly red; pleura predominantly ivory-white.). ..... 4. *fuscus* Heinrich
   Central area of propodeum white. 3
3. Scutellum laterally weakly carinate only to about middle. (Mesoscutum and anterior tergites smooth, without punctation, the former without median white lines; abdomen ferruginous-red, including basic color of tergites 6 and 7, first tergite and base of second sometimes black; smaller species, 11-13 mm long.) ..... 3. *simplex* Heinrich
   Scutellum laterally strongly carinate nearly to apex. 4
4. First tergite apically, second and third basally more or less extensively blackish infuscated; basic color of tergites 6 and 7 not black; femora III comparatively thicker than in *blandus;* widest flagellar segment about 3.5 times as wide as long; larger species, 15-17 mm long. ..... 2. *inversus* Heinrich
   First tergite sometimes, base of second and third tergites not blackish infuscated; basic color of tergites 6 and 7 usually black; femora III comparatively slenderer than in alternative species; widest flagellar segment only 3 times as wide as long; somewhat smaller species, 12-15 mm long. ..... 1. *blandus* Saussure
5. Mesopleura and areae metapleurales distinctly coriaceous, subopaque, with some transverse rugae, the latter also extensively punctured, both without white pattern, extensively dark red; pronotal ridge without white pattern. (Abdomen black with white anal marks on tergites 6 and 7; area centralis in holotype dark red; length 11 mm.) ..... 5. *nigriventris* Heinrich
   Mesopleura and areae metapleurales almost polished, without rugae, the latter punctured on upper and posterior border belt only, both extensively white; pronotal ridge white. (Abdomen ferruginous-red, usually the first tergite

entirely and the base of second and third tergite black, rarely all tergites black except ferruginous apical margins; horizontal part of propodeum uniformly black; seventh tergite only with white anal mark; length 10 mm.) ..... 6. *inferior* Heinrich

b. Males

1. Tarsi III ferruginous or brown, sometimes infuscated, never predominantly whitish. 2
   Tarsi III predominantly whitish. (Flagellum with white annulus, without tyloids.) 6
2. Central area of propodeum black. (Frons white, without median longitudinal black band; flagellum black without white annulus and without tyloids; first tergite black; length 11 mm.) ..... 4. *fuscus* Heinrich
   Central area of propodeum white. 3
3. Flagellum black, without annulus; frons white, without median longitudinal black band connecting black on ocellar region and on antennal foveae. (First tergite black; length 13 mm.) ..... 3. *simplex* Heinrich
   Flagellum with white annulus. 4
4. First tergite predominantly, bases of second and third tergites extensively black; large species, nearly 15-17 mm long. (No tyloides.) ..... 2. *inversus* Heinrich
   Second and third tergites not, or less extensively infuscated; smaller species, 11-15 mm long. 5
5. Scutellum laterally weakly carinate only to about middle; metapleura medially almost without punctation; flagellum without tyloids; white anal mark obsolete. ..... 3. *simplex* Heinrich, var.
   Scutellum laterally sharply carinate to nearly apex; metapleura strongly and fairly densely punctured all over; flagellum with distinct tyloids; white anal mark distinct. (Length 12-15 mm.) ..... 1. *blandus* Saussure
6. Lower half of mesopleura distinctly and fairly strongly, metapleura uniformly and strongly punctured, both without white pattern, mesopleura medially extensively dark red; pronotal ridge without white pattern. (Seventh tergite with white anal mark; rest of abdomen and the propodeum uniformly black; length 12 mm.) ..... 5. *nigriventris* Heinrich
   Lower half of mesopleura and areae metapleurales polished, impunctate, both almost entirely white; upper part of mesopleura black except narrowly ferruginous apex; pronotal ridge white. (Abdomen without white anal pattern, predominantly ferruginous-red, first segment and base of second black; propodeum except areae metapleurales, black; length 11 mm.) ..... 6. *inferior* Heinrich

1. *Apatetor blandus* Saussure

Figs. 5, 6

Apatetor blandus Saussure, 1890, in Grandidier. Hist. Phys. Nat. Polit. de Madag., XX, pl. XVI, figs. 7 and 7a.

Apatetor blandus Heinrich, 1938, Mém. Acad. Malg., XXV, pp. 59/60, ♀♂ and ♀ var. 1, var. 2, var. 3; description; also figs. 34, 44. 27: propodeum, tergites 1-2, scutellum.

Types

Holotype.—Not located.

Neallotype.—♂, "Madagascar, Diego-Suarez, Montagne d'Ambre, 900 to 1000 m, 20.-26.I.34, leg. A. Seyrig". C.G.H. II.

Distribution

Madagascar.

Female

Head predominantly white, with restricted dorsal black pattern; basic color of abdomen and legs ferruginous-red, tergites 6 and 7 with white

anal pattern and usually black basic color; mesoscutum blood-red, sometimes with short white median lines (var. 1 Heinrich); scutella and central area of propodeum white; thorax with some further black and rich white pattern; flagellum black with white annulus; length 12-15 mm.

Flagellum.—Structure as described for the genus; with 37-40 segments, the first about 3.5 times as long as wide, the eleventh approximately square, the widest three times as wide as long. Black, with dorsal white annulus on segments 7 (apex) or 8 to 15 or 16.

Head.—Malar space somewhat shorter than width of mandible base. White; the following black: antennal cavities, ocellar region, occiput and temples—the black of the latter extending to the very boder of eyes.

Thorax.—Anterior fifth of notauli distinct; mesoscutum very finely coriaceous, shiny, with scattered, small and shallow punctures; scutellum flat, its sides straight, gradually narrowed toward apex and sharply carinate to beyond middle or to apex; horizontal part of propodeum medially about twice as long as declivity (fig. 6); areae dentiparae usually apically not clearly separated from areae posteroexternae. Mesoscutum blood-red, sometimes with two yellowish median lines; scutella yellow, except lateral carinae, basal furrow, and lateral slopes; the following black: pronotum (except yellow collare, pronotal base and pronotal ridge), patch on mesopleura below subalarum, areae superoexternae, dentiparae, posteroexternae, and part of spiraculiferae; the rest of thorax pale ferruginous.

Legs.—Ferruginous-red; tibiae III predominantly and the tarsi III, or II and III infuscated; coxae III often partially yellowish; sometimes coxae III black-marked (var. 3 Heinrich).

Abdomen.—Very finely coriaceous, moderately shiny; sides of postpetiole, most of second tergite and basal part of the third sparsely and finely punctured (fig. 5). Ferruginous-red; first tergite often infuscated; basic color of tergites 6 and 7 usually black, sometimes red (var. 2 Heinrich), the sixth tergite with white apical band, the seventh with large white anal mark.

Male

Pleura, sterna, and anterior coxae extensively yellowish; black on ocellar region, and on antennal cavities narrowly connected medially by a black frontal stripe; scape ventrally white; white apical band on sixth tergite subobsolete or obsolete; otherwise like female; flagellum black with nearly complete white annulus on segments 14 or 15 to 21 or 22, and with narrow bacilliform tyloids on segments 9 or 10 to 18 or 20.

Ecological note

This species is very common during the entire year in humid and shady places in the forests of the plateau, Montagne d'Ambre, Rogez, Ambohimanga, Sihanaka forest, Andreba; rare in dry localities, Ampandrandava.

2. *Apatetor inversus* Heinrich

Apatetor inversus Heinrich, 1938, Mém. Acad. Malg., XXV, p. 60, ♀.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, I.-II.1931, leg. A. Seyrig". C.G.H. I.

Neallotype.—♂, "Madagascar, Rogez, forêt cote Est". C.G.H. II.

Distribution

Madagascar: Rogez and Ampandrandava.

Preamble

In the original description of this species I mentioned its great similarity to *blandus* Saussure and expressed some doubt concerning its specific distinctness. I have since examined a great number of specimens and I now consider *inversus* indubitably distinct.

Rather constant in size and always larger than *blandus;* in contrast to *blandus,* the base of tergites 1-3 always more or less extensively blackish infuscated, the basic color of tergites 6 and 7, however, never black; flagellum of female distinctly more widened beyond middle; punctation of mesoscutum subobsolete, reduced to a few scattered, shallow punctures on basal part; femora III of females comparatively wider than in *blandus;* tarsi III not infuscated. Male flagellum without tyloids (in neallotype specimen).

Female

Head predominantly white, with restricted black dorsal pattern; basic color of abdomen and legs brownish-red, always including the last tergites; tergite 7 with white anal mark, the sixth tergite sometimes apically whitish; mesoscutum blood-red, sometimes lateral lobes infuscated, median lobe with short white median lines; scutella and central area of propodeum white; thorax with some further black and rich white pattern; flagellum blackish-brown with dorsal white annulus, basal part ventrally light brown; length 15-17 mm.

Flagellum.—Structure as described for genus; with 41-43 segments, the first about 3.5 times as long as wide, the 12th approximately square, the widest fully 3.5 times as wide as long. Blackish-brown dorsally, light brown ventrally, with dorsal white annulus on segments 9-17 or 19, segments before annulus on dorsal side apically light brown.

Head, thorax, legs, and *abdomen.*—Except for the differences already mentioned in preamble, color and structure as in *blandus.*

Male

Pleura, sterna and anterior coxae lighter yellowish than in female, anal mark on seventh tergite, however, subobsolete; black on ocellar region and on antennal cavities connected by broad black median band on frons; black patch below subalarum extending almost to posterior border of mesopleura; black on propodeum including areae spiraculiferae and even part of area metapleuralis; first tergite predominantly, basal half of second tergite, and more than basal third of third tergite black; length 16.5 mm.

Flagellum.—With 41 segments; no tyloids. Black, ventrally brown, with dorsal white annulus on segments 16-23; scape ventrally white.

3. *Apatetor simplex* Heinrich

Apatetor simplex Heinrich, 1938, Mém. Acad. Malg., XXV, p. 60, ♂♀, also var. ♀ and var. ♂.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, X.1931, leg. A. Seyrig". C.G.H. I.

Allotype.—♂, "Madagascar, Diégo-Suarez, Montagne d'Ambre, 900 to 1100 m, 20.-26.I.34, leg. A. Seyrig". C.G.H. II.

Distribution

Madagascar: Rogez, Montagne d'Ambre.

Preamble

This species too is rather similar to *blandus* Saussure, but distinct nevertheless. The scutellum is laterally not carinate, or weakly only in basal half. The female has comparatively shorter and wider femora III and somewhat shorter basal segments of flagellum; furthermore the mesoscutum as well as the anterior tergites are extremely finely coriaceous, almost smooth, without distinct punctation (at 60 magnification). The color is almost identical with *blandus*, except that the mesoscutum apparently never bears white median stripes and that the basic color of tergites 6 and 7 seems never to be black. On the average, smaller than *blandus*.

Female

Head predominantly white, with restricted dorsal black pattern; basic color of abdomen and legs ferruginous-red, tergite 7 with white anal mark, the sixth apically indistinctly whitish; mesoscutum blood-red, without median lines; scutella and central area of propodeum white; thorax with some further black and rich white pattern; flagellum black with white annulus; length 11-13 mm.

Flagellum.—Structure as described for the genus; with 37 segments, the first three times as long as wide, about the 9th square, the widest three times as wide as long. Black, with dorsal white annulus on segments 7 (apex) to 16; scape ventrally reddish.

Head.—Structure and color as in *blandus*.

Thorax.—Mesoscutum extremely finely coriaceous, without punctation (except a very few fine scattered punctures on anterior part), shiny; scutellum in type weakly carinate to about middle, in other specimens lateral carinae sometimes completely obsolete; about upper third of metapleura sparsely punctured, the rest polished, impunctate. Color as in *blandus*, except constantly lacking white median lines on mesoscutum and except uniformly ivory-colored pleura and sterna; areae spiraculiferae entirely or extensively black.

Legs.—Femora III comparatively shorter and wider than in *blandus*. Almost uniformly ferruginous-red, base of tibiae III and tarsi III slightly infuscated; coxae III varying from reddish-yellow to yellow, sometimes black-marked.

Abdomen.—Middle of petiole in type with vestiges of aciculation, in other specimens completely smooth; second and following tergites smooth

and shiny, without punctation, extremely finely coriaceous. Ferruginous-red, including tergites 6 and 7, in type first segment and basal half of second black; first segment varying from uniformly black to ferruginous-red (var. ♀ Heinrich), the second tergite rarely partially black; seventh tergite with white anal mark.

Male

Description based on allotype.

Pleura, sterna and anterior coxae ivory; black on ocellar region and on antennal cavities not connected on frons; scape ventrally white-marked; white anal pattern obsolete; first tergite black; mesoscutum predominantly blackish infuscated; femora I and II dorsally, femora III apico-dorsally, tibiae and tarsi III slightly infuscated; flagellum with 37 segments, black, without annulus and without tyloids; otherwise like female; length 13 mm.

4. *Apatetor fuscus* Heinrich

Apatetor fuscus Heinrich, 1938, Mém. Acad. Malg., XXV, p. 61, ♂♀.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, XI.-XII.1931, leg A. Seyrig". C.G.H. I.

Allotype.—♂, same locality, I.-II.1931. C.G.H. II.

Distribution

Madagascar: Rogez, Ankaratra, Sihanaka Forest.

Preamble

When I described this form I was in some doubt about its specific distinctness from *simplex* Heinrich. I have recently once more compared the types and several other specimens of both forms and I am convinced now that they are indeed specifically different, although the similarity is striking. *Apatetor fuscus* is rather constant in size and distinctly smaller than *simplex;* the deciding structural difference is in the proportions of the female flagellum, which is distinctly less widened beyond middle in *fuscus* than in *simplex*. Not less important perhaps in this case is a chromatic character: the constantly uniformly black central area of propodeum which in all the preceding species of this genus is constantly uniformly white. Besides, in *fuscus* the areae dentiparae are narrower, more elongate, more gradually slanting, and in their basal part almost inpunctate, as are the areae superoexternae, whereas in *simplex* the areae dentiparae are uniformly coarsely and densely punctured, the areae superoexternae coarsely and sparsely.

Female

Head predominantly white with restricted dorsal black pattern; basic color of abdomen and legs ferruginous-red, seventh tergite with indistinctly limited ivory mark; first tergite and base of second black; mesoscutum blood-red, without median lines, scutella white; central area of propodeum black, also the lateral areae of horizontal part; thorax with some further black and rich white pattern; flagellum black with white annulus; length rather constantly 11 mm.

Flagellum.—Structure as described for the genus; with 32-35 segments, the first about 3.5 times as long as wide, about the 12th square, the widest 2 to 2.5 times as wide as long. Black, with complete white annulus on segments 8 or 9 to 14, segments before annulus apically brownish.

Head.—Structure and color as in *blandus,* the black of antennal cavities and ocellar region, however, more restricted.

Thorax.—Structure and color as in *simplex,* except for the black central area of propodeum and the sculpture of metapleura which are uniformly extremely finely coriaceous, without punctation on their upper part; areae superoexternae and basal part of dentiparae without punctation, or only with a few scattered, coarse punctures, both narrower and more elongate than in *simplex.* Areae spiraculiferae varying from ferruginous to black; sometimes mesosternum, base of prosternum and median part of prepectus blackish infuscated (type); mesopleura ivory except for the usual black patch below subalarum.

Legs.—Ligth ferruginous, tibiae and tarsi III slightly darker; coxae and trochanters I and II and base of coxae III yellowish.

Wings.—Clear; areolet constantly pentagonal.

Abdomen.—Middle of postpetiole weakly and sparsely striate; some very short striae also on space between gastrocoeli; second and following tergites almost polished, without punctation. Ferruginous-red, seventh tergite dorsally ivory, first and basal part of second tergite black.

Male

Based on allotype. Agrees very closely with *simplex;* differs only by the black central area of propodeum, smaller size, lack of infuscation on mesoscutum and legs; scutellum basally more raised and basally black; black on antennal cavities and ocellar region more restricted.

Pleura, sterna, and anterior coxae ivory; black on ocellar region and on antennal cavities restricted and not connected on frons; scape ventrally white-marked; white anal pattern obsolete; first tergite black; central area of propodeum black as are the lateral areae; mesoscutum and legs not infuscated; flagellum with 36 segments, black, without annulus and without tyloids; otherwise like female; length 11 mm.

5. *Apatetor nigriventris* Heinrich

Apatetor nigriventris Heinrich, 1938, Mém. Acad. Malg., XXV, p. 61, ♀♂.

Types

Holotype.—♀ (abdomen destroyed by dermestids), "Madagascar, Ankaratrageb, 1800 m, XII.-II., leg. A. Seyrig". C.G.H. I.

Allotype.—♂, same locality and date. C.G.H. II.

Distribution

Madagascar: Ankaratra, Vatondrangy, Diégo-Suarez.

Preamble

In my original conception this was the only species of this genus with predominantly black abdomen and with extensively white tarsi III. Erroneously, I attributed to it a very high degree of individual chromatic variability. I am now convinced that this is a complex of several, extremely

similar and also individually variable species and subspecies. At least my var. 1, distinguished by extensively white lower half of mesopleura and white pronotal ridge and base, represents a distinct second species. There may be even a third species involved. Under the circumstances, subspecific connections can not be stated until a special study of the entire complex has been made. The following description is based on the holotype.

Female

Head predominantly white, with restricted dorsal black pattern; abdomen black, tergites 6 and 7 predominantly white; mesoscutum blood-red; scutella white; central area of propodeum dark red, as are most of the pleura and of the mesosternum; lateral areae of horizontal part black; legs predominantly light red, tarsi III extensively whitish; coxae partially white; length about 11 mm.

Flagellum.—Structure as described for the genus; with 37 segments, the first about 3 times as long as wide, about the 10th square, the widest 3 times as wide as long. Black, with full white annulus on segments 9-15; scape ventrally red-brown, as are the basal segments before annulus apically on dorsal side and ventrally more extensively.

Head.—Structure as described for the genus. The following white: outer orbits broadly from temples down almost to mandible base, entire frons and vertex except ocellar triangle; face and clypeus predominantly obscure reddish; rest black.

Thorax.—Mesoscutum very finely coriaceous, without punctures, shiny; basal fourth of notauli distinct; scutellum distinctly convex dorsally, slightly raised above postscutellum, its basal third laterally weakly carinate; propodeum rather coarsely sculptured, even central area fairly strongly irregularly rugose, the lateral areae of horizontal part coarsely rugose-punctate; anterior and upper part of area metapleuralis coarsely and not very densely punctured, the lower median part almost impunctate, with vestiges of transverse rugosity; propleura and mesopleura finely coriaceous and subopaque, the latter on lower half weakly and obliquely striate, with some shallow punctures; central area fairly narrow and elongate, anteriorly in the middle somewhat projecting toward postscutellum, not separated from area posteromedia. Dark red; the following black: pronotal base, apex of median lobe of mesoscutum, lateral slopes of scutellum, areae superoexternae, dentiparae, posteroexternae, and coxales, also apex of area posteromedia, prosternum, lower apical part of mesopleura, patch below subalarum, entire prepectus, carinal triangle, middle of mesosternum.

Legs.—Light red, tibiae III slightly infuscated; coxae ventrally dark brown to black, coxae I and II extensively whitish-marked; coxae III dorsally red and blackish; tarsi III from apex of first to fifth segment whitish.

Wings.—Clear; areolet not quite quadrangular.

Abdomen.—Postpetiole very finely alutaceous, laterally and basally with few, scattered punctures, without traces of aciculation. Black; sixth and seventh tergites predominantly white.

Male

Head predominantly white, with dorsal black pattern; sterna, propodeum, and coxae III uniformly, mesopleura extensively, black; coxae and

trochanters I and II white; abdomen black, white anal marks reduced: the sixth tergite with white apical margin only, the seventh predominantly white; flagellum black with white annulus; all tarsi predominantly whitish; length 12 mm.

Flagellum.—Without tyloids. Black, with complete white annulus on segments 17-21; scape ventrally white.

Head.—White; the following black: antennal cavity, middle of frons broadly, ocellar, occipital, and temple regions (broadly to the very border of eyes), hind third of cheeks down nearly to mandible base.

Thorax.—Scutellum more strongly convex than in female; in contrast to female type, central area smooth, areae metapleurales evenly and coarsely punctured; areae superoexternae sparsely punctured. Black more extensive than in female; the following black: sterna and prepectus uniformly, lower third of propleura, mesopleura except median part, propodeum uniformly.

Legs.—Coxae and trochanters I and II white, coxae III blackish, trochanters III blackish-brown; tibiae I and II pale orange tinged, tibiae III slightly infuscated; all tarsi whitish except basal 3/4 of metatarsi III which are brownish-red.

6. *Apatetor inferior* Heinrich

Apatetor nigriventris inferior Heinrich, 1938, Mém. Acad. Malg., XXV, p. 62, ♀♂.
Apatetor nigriventris Heinrich, var. 1, ♀, loc. cit. pp. 61 and 62.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, XI.-XII. 1931, leg. A. Seyrig". C.G.H. I.

Allotype.—♂, same locality and date. C.G.H. II.

Distribution

Madagascar: Rogez, Tananarive.

Preamble

Reexamination of the types and of additional specimens has fully convinced me that my conspecific association of *inferior* Heinrich and *nigriventris* Heinrich was a mistake. These are two distinct species, which agree in the white pattern of tarsi III, but differ in sculpture, particularly of pleura, and also in some color pattern.

In contrast to *nigriventris,* about lower half of mesopleura and the metapleura more or less extensively white, both polished; white anal pattern obsolete in males, restricted to the last tergite in females; in specimens from type locality abdomen predominantly ferruginous-red; in the female from Tananarive basic color of abdomen black (individual, or geographical variety?).

Female

Head predominantly white, with restricted black dorsal pattern; abdomen ferruginous-red, with more or less extensively black bases of tergites 1 to 2 or to 3, sometimes entirely black, the last tergite with white anal mark; scutella white; about lower half of mesopleura, metapleura more or

less extensively, pronotal ridge and base white; horizontal part of propodeum black, including central area; legs predominantly ferruginous-red, tarsi III extensively whitish; coxae partially white; length 10 mm.

Flagellum.—Structure as described for genus; with 37-39 segments, the first about 4 times as long as wide, about the 14th square, the widest fully 3 times as wide as long. Black, with complete white annulus on segments 8 (base or apex) to 14 or 15; basal segments before annulus ventrally extensively, dorsally only apically brownish.

Head.—Structure as described for the genus; temples and occiput not quite as abruptly and steeply declivous behind ocelli and eyes as in *nigriventris.* White, including face and clypeus; the following black: antennal cavities, ocellar triangle, occipital and temple regions, black of the latter sometimes not fully extending to the margin of eyes.

Thorax.—Mesoscutum very finely coriaceous, as in *nigriventris,* without punctures, shiny; notauli basally distinct; scutellum slightly convex, apically scarcely raised above postscutellum, basal third laterally weakly carinate; areae dentiparae, spiraculiferae, and posteromediа rather coarsely punctured; central area and areae superoexternae finely coriaceous, the latter with a few scattered punctures; areae metapleurales and the mesopleura, in contrast to *nigriventris,* shiny, almost polished, without rugae and nearly without punctures, except sometimes for some sparse punctation on upper and apical part of areae metapleurales; area centralis fairly narrow and elongate, apically not separated from area posteromedia, anteriorly in the middle slightly projecting toward postscutellum. Mesoscutum and apical part of propleura blood-red; the following white: collare, pronotal ridge, pronotal base, subalarum, scutella, apex of prosternum, about lower half of mesopleura together with exterior part of prepectus, exterior part of mesosternum between sternauli and mesopleura, areae metapleurales extensively to almost entirely; the following black: prepectus medially, propleura more or less extensively, upper part of mesopleura except apically, areae coxales, areae superoexternae, dentiparae, posteroexternae, and centralis, mark on mesopleura before coxae II, apex of median lobe of mesoscutum, lateral slopes of scutellum; ferruginous-red are: rest of sterna and of propodeum.

Legs.—Ferruginous-red; the following whitish: coxae and trochanters I and II, coxae III dorsally extensively, and tarsi III except more or less extensively ferruginous base of metatarsus; tibiae III only slightly infuscated.

Wings.—Clear; areolet strongly narrowed anteriorly, but not quite quadrangular.

Abdomen.—Middle of postpetiole with vestiges of longitudinal striae; second tergite extremely finely coriaceous, shiny. Ferruginous-red; first tergite predominantly, the second and third tergite basally blackish infuscated; seventh tergite with white anal mark, apical margin of sixth tergite whitish.

Male

Mesosternum medially extensively white; white anal pattern obsolete; otherwise like female; length 11 mm.

Flagellum.—With 36 segments, without tyloids. Black, with complete white annulus on segments 15-20; scape ventrally white.

Var. ♀

In the only known specimen from Tananarive the basic color of tergites 1-6 is black, with narrowly ferruginous apical margin of tergites; the ferruginous color on sterna and coxae III is replaced by black or blackish-brown, and the areae metapleurales are red, with small whitish mark only. This coloration may indicate a distinct geographical subspecies as well as a mere individual melanism.

3. Genus *Coelapatetor*, new genus

Fig. 7

Type species.—*Coelapatetor aciculatior*, new species

Distribution

Northern, eastern, and southern Tanganyika at altitudes between 1400 m and 1600 m.

Preamble

This genus is nearly identical in propodeal structure with the Madagascan *Apatetor* Saussure, but differs by more strongly sclerotized tergites with coarse and dense, more or less extensively aciculate sculpture, and by larger and deeper gastrocoeli (fig. 7). The abdomen thus agrees well with the Holarctic genus *Coelichneumon* Thomson, from which *Coelapatetor* differs, in addition to the propodeal structure mentioned, by more or less pronounced lateral carination of the scutellum. The species comprised in this genus display common chromatic features: entirely red abdomen, in contrast to *Apatetor* without white anal pattern, and very rich white pattern on the thorax with white median lines on the medially red mesoscutum.

The two species, *polyaenoides* Szépligeti and *angolensis* Heinrich, have convergent chromatic and sculptural features, but differ in structure of clypeus and mandibles; furthermore, the fusion of area superomedia and basalis is not complete, as a faint separating carina is usually visible; they are thus structurally intermediate between *Musakia* Strand and *Coelapatetor* and their attribution to one or the other of the two genera is arbitrary; they have been tentatively included in the former genus.

Morphological characters

Flagellum.—Of females bristle-shaped, slender, little widened beyond middle and strongly attenuated at apex; of males slightly nodose by transverse bristle ridges on ventral side, with unobtrusive small bacilliform tyloids which are partially hidden by the exterior end of bristle ridges.

Head.—Temples and cheeks moderately to distinctly narrowed, temple profile with slightly curved outline; median field of face slightly raised; clypeus completely flat, without trace of basal convexity or median subapical concavity, its apical border straight; mandibles rather robust, of median length, a distinct gap between the narrower and long apical, and the short, wide subapical tooth.

Thorax.—Basal part of notauli distinct; mesoscutum finely coriaceous with sparse and shallow, or (type species) without punctation; scutellum

dorsally more or less strongly convex, laterally sharply (type species) or weakly carinate nearly to apex, more or less distinctly raised above postscutellum; propodeum with distinct, though not wide, basal furrow, in type species declivity shorter than horizontal part; central area complete, area superomedia not at all separated from area basalis and not distinctly from area posteromedia, the latter irregularly, transversely rugose; areae dentiparae apically not, or indistinctly, separated from areae posteroexternae; area centralis somewhat widened at costulae.

Legs.—Fairly long and slender in type species, stout in second species; coxae III sometimes with, in type species without, scopa.

Wings.—Clear; areolet quadrangular.

Abdomen.—Of females oxypygous; postpetiole with indicated median field which is strongly and densely aciculate; also middle of second and third tergites strongly longitudinally striate, in type species most of the surface of second tergite strongly aciculate; gastrocoeli large and deep, with large thyridia; hypopygium of males not sharply, triangularly projecting, but obtuse, nearly truncate.

Key to the species of *Coelapatetor* Heinrich

1. Mandibles slightly tapering toward apex, with small subapical teeth, separated from the much longer apical tooth just by a notch, not by a distinct gap; second tergite dorsally not regularly aciculate; gastrocoeli moderate. ..... see *Musakia* Strand
   Mandibles not tapering toward apex, with strongly developed subapical tooth, separated from the apical tooth by a wide gap; second tergite dorsally striate; gastrocoeli deep. 2
2. Scutellum white with drop-shaped, ferruginous, median mark; mesopleura punctate; femora III short and swollen; coxae III of females with strong scopa. ..... 2. *pictiscuta*, new species
   Scutellum uniformly white; mesopleura polished; femora III slender; coxa III of females without scopa ..... 1. *aciculatior*, new species

1. *Coelapatetor aciculatior*, new species

Fig. 7

Types

Holotype.—♀, "Tanganyika, Uluguru Mts., 1500 m, 5.XII.1961". C.G.H. II.

Allotype.—♂, same locality and date. C.G.H. II.

Paratypes.—3♀♀, 6♂♂, same locality, 5.XII.—20.XII.1961. C.G.H. II.

Distribution

Eastern Tanganyika: Uluguru Mts.

Preamble

Distinguished by the fairly strongly convex scutellum with sharp lateral carinae, the polished, predominantly white mesopleura and metapleura and by the almost entirely strongly striate surface of second tergite.

Female

Head white with black dorsal pattern; abdomen uniformly chestnut-red, legs predominantly ferruginous-red; mesoscutum predominantly chestnut-red, with short white median lines; scutella, all of central area of pro-

podeum and most of mesopleura and metapleura white; thorax with some further white and with black pattern, mesosternum ferruginous; flagellum black with white annulus; length 12 mm.

Flagellum.—Structure as described for the genus; with 41 segments, long and slender, the first about 4 times as long as wide, the 15th approximately square, the widest little more than twice as wide as long. Black, with complete white annulus on segments 8 (apex) to 16 or 18; scape ventrally white.

Head.—Almost impunctate and polished; temples comparatively narrow, with slightly rounded outline; cheeks in lateral view wide, slightly swollen; carina genalis and oralis meet at the very corner of mandible, not before it as usually. White; median field of face faintly ferruginous tinged; the following black: antennal cavity, middle of frons broadly, and ocellar region, all forming together a nearly parallelsided black band, occipital region, posterior side of head, temple region, the black sometimes narrowly touching the border of eyes, a narrow line on malar space.

Thorax.—Mesoscutum very finely coriaceous, almost impunctate, shiny; scutellum dorsally strongly convex, gradually sloping toward postscutellum, laterally sharply carinate to beyond middle; basal furrow of propodeum distinct, though not wide; central area slightly widened at costulae; horizontal part twice as long as declivity, rather smooth, declivity transversely rugose; mesopleura and metapleura polished, impunctate except for some scattered punctures on upper belt of areae metapleurales. Mesoscutum chestnut-red, with two short wedge-shaped white median lines, somewhat infuscated along exterior borders; pleura, propodeum, prepectus, and prosternum white and black, mesosternum pale ferruginous tinged; the following white: collare, pronotal ridge, and base broadly, lower exterior part of propleura, mesopleura (except approximately their upper third black), areae metapleurales except lower anterior part, areae spiraculiferae in front of spiracles, subalarum, tegulae, short median lines on mesoscutum, surface of scutella, area centralis from postscutellum to petiole, middle of prepectus broadly, prosternum predominantly; rest black.

Legs.—Fairly slender; coxae III without scopa. Ferruginous-red; dorsal bands on femora I and II, tip of femora III, base and apex of tibiae III, dorso-exterior band on coxae III, trochanters III dorsally, and all tarsi infuscated, the tarsi III black; coxae and trochanters I and II extensively, coxae III dorsally white.

Wings.—Clear; areolet quadrangular.

Abdomen.—Median field of postpetiole, nearly entire surface of second tergite and middle of third tergite strongly and densely aciculate fig. 7; gastrocoeli large and deep, with distinct thyridia; suture between second and third tergite pronounced. Uniformly chestnut-red; petiole sometimes black.

Male

Face clear white; sometimes mesoscutum exteriorly and legs more intensely and extensively infuscated than in female; petiole usually black; mesosternum extensively whitish, exteriorly sometimes irregularly blackish infuscated; otherwise black and white pattern on head and thorax exactly as in female; length 12-13 mm.

Flagellum.—With 40-42 segments and with small, almost rudimentary, bacilliform tyloids on segments 12 or 13 to 16. Black, with complete white annulus on segments 14 (apex) or 15 to 22 or 23 or 24; scape ventrally white.

Legs.—Dorsal side of all femora often black, also tibiae usually dorsally more or less blackish infuscated; tibiae I internally ivory; otherwise like female.

2. *Coelapatetor pictiscuta*, new species

Types

Holotype.—♀, "Southern Tanganyika, Chimala, 1400 m, 17.I.1963" C.G.H. II.

Paratype.—1 ♀, same locality and date. C.G.H. II.

Distribution

Southern Tanganyika.

Preamble

This species is clearly distinguished by short, swollen femora III, distinct scopa on coxae III of females, and a large, drop-shaped, light-red mark on the middle of the white scutellum.

Female

Head white with ferruginous-red and restricted dorsal black pattern; thorax predominantly ferruginous-red, with rich white and restricted black pattern; mesoscutum with short white median lines; scutellum white with large light-ferruginous median mark; abdomen uniformly light ferruginous, legs predominantly; flagellum black with white annulus; length 15 mm.

Flagellum.—Structure as described for the genus; with 43-44 segments, the first fully 3.5 times as long as wide, about the 17th square, the widest less than twice as wide as long. Black, with almost complete white annulus on segments 8 (apex) to 16; scape ventrally ferruginous; basal segments before annulus apically brownish.

Head.—Structure as described for the genus; temples fairly narrow, with slightly curved outline; cheeks in lateral view rather wide and somewhat swollen; clypeus and face distinctly but sparsely punctured, frons, vertex, and temples smooth. White; the following ferruginous: median field of face, antennal cavities, median field of frons partially, median part of occipital region behind ocelli, lower posterior part of temple region; the following black: ocellar region predominantly (the black projecting below more or less extensively into the ferruginous middle of frons) and temple region partially.

Thorax.—Anterior fourth of notauli pronounced; mesoscutum very finely coriaceous, sparsely punctured, particularly the median lobe and anterior parts of lateral lobes; scutellum slightly convex, laterally weakly carinate to beyond middle; declivity and horizontal part of propodeum nearly of equal length; central area distinctly widened at costulae and fairly strongly narrowed toward postscutellum and toward area posteromedia, irregularly rugose; areae dentiparae apically not clearly defined from areae posteroexternae, coarsely and densely punctured; all pleura distinctly and fairly densely punctured. Predominantly light ferruginous-

red, including mesoscutum; the following black: middle of pronotum behind collare, patch below subalarum (the black color extending as a band into depression below speculum), mark on mesoscutum before base of scutellum; areae dentiparae blackish infuscated; the following white: collare, pronotal ridge and base broadly, subalarum, two short, wedge-shaped median lines on mesoscutum, sides and apex of scutellum, postscutellum, central area of propodeum from postscutellum to base of area posteromedia, areae posteroexternae, carinal triangle, large mark on posterior part of areae metapleurales, smaller mark on mesopleura behind black patch below subalarum, approximately lower half of mesopleura extending onto exterior third of prepectus, exterior ventral belt of prepectus, prosternum predominantly, mesosternum apico-medially.

Legs.—Femora III short and swollen; coxae III with large, strong scopa. Light ferruginous-red, tarsi III blackish, II and I slightly infuscated; coxae I and II apically extensively white, the coxae III basally on inner side.

Abdomen.—Middle of postpetiole and of second tergite strongly longitudinally striate; lateral fields of postpetiole and the second and third tergites strongly and densely punctured, the punctures on median parts of both the latter tergites running into longitudinal rugosity; gastrocoeli very deep and large with large thyridia. Uniformly ferruginous.

4. Genus *Coeloleptops*, new genus

Type species.—*Apatetor effigies* Heinrich

Preamble

This genus combines a robust head and mandible structure, very similar to *Liojoppa* Szépligeti, with propodeal features as in *Apatetor* Saussure, and with the nearly semiglobular scutellum of *Corymbichneumon* Morley. The female abdomen with sharply striate postpetiole and large, deep gastrocoeli could well belong to an European *Coelichneumon*, but is unusually narrow and elongate for that genus.

Distribution

Madagascar (type species); southeastern and eastern Africa.

Morphological characters

Flagellum.—Of females long, very slender, bristle-shaped, not widened beyond middle, strongly attenuated toward apex; of males likewise long and slender, with a row of short, narrowly elliptic tyloids and with transverse bristle ridges on ventral side.

Head.—Strong, the temple profile broadly rounded and scarcely narrowed behind eyes; cheeks in lateral view broad, distinctly swollen; clypeus and face not sharply separated, the latter with scarcely indicated, medially insignificantly raised median field, the former with straight apical border and subobsolete lateral corners; mandibles short and wide, with strong, subequal apical theeth separated by a wide gap; oral and genal carinae normal; clypeus, face, and apex of cheeks finely and sparsely punctured; rest of head smooth.

Thorax.—Mesoscutum elongate, distinctly longer than medially wide; anterior fourth, or sometimes even third of notauli pronounced; pronotal ridge somewhat widened, particularly its anterior part; scutellum strongly elevated above postscutellum, in type species approximately semiglobular and laterally not carinate, in other species sharply carinate, dorsally sometimes strongly convex with long and steep apical and lateral slopes; propodeum apically rounded, the areae spiraculiferae clearly defined apically and curved moderately far downward; costulae distinct; areae superomedia, basalis, and posteromedia fused into one longitudinal central area which is fairly smooth, narrowed from costulae toward declivity, widened in front before postscutellum and separated from the latter anteriorly by a narrow basal furrow; all other areae coarsely rugosely punctate.

Legs.—Coxae III of females without scopa; femora rather slender.

Wings.—Clear; areolet quadrangular, or even short-petiolate.

Abdomen.—Narrow, elongate, in female distinctly oxypygous; postpetiole fairly narrow, median field indicated, though laterally not sharply defined, sharply, longitudinally striate; gastrocoeli about quadrangular, large and deep, with pronounced thyridia; second tergite much longer than wide, the following tergites scarcely or slightly wider than long; second and third tergites medially longitudinally striate; ovipositor slightly projecting; hypopygium of males short, obtusely and bluntly triangular.

Color

The basic color of all known species is orange-red or red-brown, head and thorax with some black and rich white pattern; mesoscutum black, or medially red, often with white median lines; scutella white; white anal mark on seventh tergite in two species.

Key to the species of *Coeloleptops* Heinrich
Females and Males

1. External carina bordering mesoscutum before curved anterior end of prescutellar carina with very distinct ear-shaped lateral projection; scutellum approximately semiglobular, laterally not carinate, except at the very base; mesoscutum red, without yellow median lines. (The seventh tergite with white anal mark; length 14 mm.) ..... 1. *effigies* (Heinrich) Madagascar

   External carina bordering mesoscutum without such projection; scutellum very strongly raised and laterally sharply carinate; mesoscutum with red median lobe only or entirely black, always with short white median lines. 2

2. Basic color of abdomen, legs, and pleura orange; scutellum dorsally strongly convex, apically declivous in a rounded slope; propleura sparsely punctured on upper, almost smooth on lower part; mesopleura without distinct white markings. (Length 12-14 mm.) ..... 2. *gracilicolor*, new species Tanganyika, Cape Province

   Basic color of abdomen, legs, and pleura chestnut-red; scutellum dorsally scarcely convex; apically almost perpendicularly declivous; propleura coarsely and rather densely punctured; mesopleura with distinct white markings. (Length 14 mm.) ..... 3. *prominens*, new species Tanganyika

1. *Coeloleptops effigies* (Heinrich), new combination

Apatetor effigies Heinrich, 1938, Mém. Acad. Malgache, XXV, p. 65/66, ♀♂.

Types

Holotype.—♀, "Madagascar, Anivorano, XII.29, leg. A. Seyrig". C.G.H. I.

Allotype.—♂, "Madagascar, Bekily, Sec. Sud de l'île, III.33". C.G.H. II.

Distribution

Madagascar: Anivorano and Ampandrandava (Bekily).

Preamble

From the two other species described below from the African continent, this one is at once distinguishable by the semiglobular scutellum laterally carinate only at the very base, and by a very distinct rounded projection of the lateral carina bordering mesoscutum right before the anterior end of the prescutellar carina. Otherwise all three species are closely related.

Female

Light ferruginous-red, mesoscutum blood-red, without white median lines; thorax with rich white and some black pattern, scutella white; head white with dorsal black pattern; first tergite extensively, apex of sixth and basic color of seventh tergite black, the seventh tergite with large white apical mark; flagellum black with complete white annulus; tarsi and the base of tibiae III moderately infuscated; length 14 mm.

Flagellum.—Long, slender, bristle-shaped, with 36 segments, the first elongate, fully 5 times as long as wide, about the 13th square, none wider than long. Black, with complete white annulus on segments 7 (apex) to 15.

Head.—Structure as described for the genus. White; the following black: antennal cavity, middle of frons, ocellar region, occipital region, temple region (the black color of temples extending broadly to margin of eyes), posterior surface of head predominantly; orbits white on frons and vertex with rounded extension above to slightly beyond summit of vertex.

Thorax.—Pronotal ridge distinctly widened from opposite base of notauli to apex; anterior fourth of notauli pronounced, their very base deepened; tegulae medially strongly raised, with a blunt, longitudinal, median ridge, steeply declivous to both sides; external carina bordering mesoscutum before anterior end of prescutellar carina with a strong, ear-shaped lateral projection; scutellum strongly raised above postscutellum, about semiglobular, slightly narrowed apically and rather steeply sloping, laterally carinate at the very base only; central area of propodeum moderately smooth, narrowed from costulae toward apex and somewhat less strongly toward base as well, the basal part widened again toward postscutellum; lateral areae strongly and densely punctured. Orange, the mesoscutum blood-red; the following white: collare, pronotal ridge and base broadly, scutella dorsally, carinal triangle; black are: rest of pronotum, scutella laterally, propodeum except entire central area and except metapleura, patch below subalarum extending backward underneath speculum; prosternum and pleura extensively yellowish.

Legs.—Orange; coxae I and II yellowish; the tarsi and dorsal side of tibiae slightly, base of tibia III more distinctly infuscated.

Wings.—Clear; areolet quadrangular.

Abdomen.—Orange-red; first tergite infuscated except apically; middle of sixth tergite and basic color of seventh black, the seventh with large white anal mark.

Male

Agrees almost exactly with female, except that the red mesoscutum is laterally and apically slightly infuscated, and that the prosternum is basally blackish; flagellum black, with white annulus on segments 12-17 and with short, narrowly oval tyloids on segments 11-18; scape ventrally white; length 12 mm.

2. *Coeloleptops gracilicolor*, new species

Types

Holotype.—♀, "Southern Tanganyika, Mbeya, 7.XII.62." C.G.H. II.
Allotype.—♂, "N. Tanganyika, Uluguru Mts., 700 m." C.G.H. II.
Paratypes.—17 ♀♀, type locality, 16.-17.XII.62. C.G.H. II.

Distribution

Eastern Tanganyika, Uluguru Mts. at Morogoro, 700 m., and southern Tanganyika, Mbeya; Cape Province, Port St. Johns.

Preamble

Rather closely related to *effigies* Heinrich, but differing by laterally sharply carinate scutellum, normal tegulae, lack of ear-shaped lateral projections of exterior mesoscutal carinae in front of prescutellar carinae and by the black lateral lobes of mesoscutum.

Female

Orange-red; central lobe of mesoscutum entirely or predominantly blood-red with short white median lines, lateral lobes black; thorax with some further black and rich white pattern; pleura without distinct white marks; head white with dorsal black pattern; abdomen and legs almost uniformly orange, apex of last tergite indistinctly yellowish; tarsi III infuscated; length 12-14 mm.

Flagellum.—Long, slender, bristle-shaped, with 35-37 segments, the first more than 5 times as long as wide, about the 17th square, none wider than long. Black, with nearly complete white annulus on segments 8 to 13 or 14.

Head.—Structure as described for the genus. Color almost exactly as in *effigies* Heinrich, except that the white around eyes is not interrupted on temples, as the black color of temple region does not reach the border of eyes.

Thorax.—Pronotal ridge distinctly widened from opposite base of notauli to apex, but a trifle constricted before apex; anterior fourth of notauli pronounced; tegulae normal; external carina bordering mesoscutum distinctly raised before prescutellar carina, but without ear-shaped lateral projection; scutellum very strongly raised above postscutellum, la-

terally sharply carinate, with steep, apical slope; central area of propodeum fairly smooth, except slight rugosity, gradually widened from costulae to basal furrow of propodeum, narrowed apically toward declivity; lateral areae coarsely and densely punctured. Orange; median lobe of mesoscutum predominantly or entirely blood-red, with two short white median lines; lateral lobes black; the following white: collare, pronotal ridge and base broadly, subalarum, scutellum, short median lines on mesoscutum, carinal triangle, prosternum and mesosternum; the following black: rest of pronotum, small mark on mesopleura below subalarum, lateral declivities of scutella, sometimes areae superoexternae and dentiparae more or less extensively.

Legs.—Almost uniformly orange, only tarsi III infuscated and anterior coxae pale yellowish.

Wings.—Clear; areolet quadrangular.

Abdomen.—Structure as described for the genus. Uniformly orange.

Remark

The female from South Africa is larger than all specimens from Tanganyika, the flagellum has 40 segments, the white orbits are narrowly interrupted on vertex and the scape of antenna is uniformly orange. These differences may indicate a subspecific differentiation.

Male

Agrees almost exactly with female, except that the blood-red color on median lobe of mesoscutum is reduced to a longitudinal median band, and that the white orbital color is broadly interrupted on temples; flagellum black, with complete white annulus on segments 12-18, and with short, narrowly oval tyloids on segments 11-18; length 13 mm.

3. *Coeloleptops prominens*, new species

Types

Holotype.—♀, "Southern Tanganyika, Mbeya, 19.XI.62." C.G.H. II.

Allotype.—♂, "N. Tanganyika, W. Usambara Mts., Lushoto, 1600 m, 25.II.1962." C.G.H. II.

Distribution

Northern Tanganyika, West Usambara Mts., 1600 m, and southern Tanganyika, Mbeya.

Preamble

Very closely related to, and structurally almost identical with *gracilicolor* Heinrich. Nevertheless a distinct species, as it occurs together with the latter. Differs by chestnut-red basic color of abdomen and legs, by coarser sculpture, particularly on propleura, and by still more strongly elevated and dorsally less convex scutellum; basic color of mesoscutum uniformly black.

Female

Chestnut-red; mesoscutum uniformly black, with short white median lines; thorax with some further black and rich white pattern; mesopleura with distinct white marks; head white with dorsal black pattern; abdomen

and legs almost uniformly chestnut-red, last tergite with small yellowish anal mark; tarsi III infuscated; length 14 mm.

Flagellum.—Long, slender, bristle-shaped, with 39 segments, the first more than 5 times as long as wide, about the 17th square, none wider than long. Black, with nearly complete white annulus on segments 8-14.

Head.—Structure as described for the genus. Color almost exactly as in *gracilicolor,* except that the outer and apical margin of cheeks, the malar space and mark above clypeal foveae are black; middle of face and clypeus reddish, white around eyes narrowly interrupted on temples.

Thorax.—Structure, particularly of pronotal ridge, notauli, and tegulae as in *gracilicolor,* but the scutellum more strongly elevated above postscutellum and dorsally less convex; lateral carinae of scutellum higher and longer, their apices almost meeting each other in the middle of its rounded apex; apical slope of scutellum nearly perpendicular; central area of propodeum nearly as in *gracilicolor,* but somewhat constricted at the (obsolete) anterior border of area superomedia and then again widened toward postscutellum. Chestnut-red; mesoscutum black, with short white median lines; the following also white: collare, pronotal base and ridge broadly, subalarum, scutella (except lateral slopes), mark on anterior upper and posterior lower part of mesopleura, carinal triangle, exterior band on prepectus; the following black: rest of pronotum, base of prosternum, mark on mesopleura below subalarum, prepectus predominantly, areae superoexternae and dentiparae, scutella laterally.

Legs.—Almost uniformly chestnut-red; coxae I and II dorsally whitish-marked; apices of tarsi II and tibiae III and the tarsi III infuscated.

Abdomen.—Chestnut-red, seventh tergite with small yellowish apical mark.

Male

Agrees almost exactly with female, except that face, clypeus, and lower cheeks are uniformly white and that the black on prepectus is reduced to a small mark on the inner part of each side; flagellum black including scape, with dorsal white annulus on segments 12-16 and with small, short, narrowly oval tyloids on segments 11-18; length 12.5 mm.

5. Genus *Protoleptops,* new genus

Figs. 8, 9

Type species.—*Protoleptops heinrichi,* new species

Distribution

Madagascar.

Preamble

The type species is undoubtedly generically distinct from *Apatetor* Saussure. It is distinguished by the coarse and striate sculpture of anterior tergites, deep gastrocoeli and mandible shape. It seems to be most closely related to *Coeloleptops* Heinrich, from which it differs by the flat scutellum and by the medially interrupted basal furrow of propodeum.

Morphological characters

Flagellum.—Of females bristle-shaped, moderately long, ventrally flattened and distinctly widened beyond middle, moderately attenuated at apex; of males with distinct longish oval tyloids, without sigilla, slightly nodose by transverse bristle ridges on ventral side only in apical part (beyond white annulus).

Head.—Temples and cheeks moderately wide; ocellar region slightly raised and surrounded, except posteriorly, by a distinct furrow; clypeus nearly flat, its lateral corners blunted, the apical margin nearly straight, medially slightly and obtusely projecting; mandibles short and very stout, the unequal teeth separated by a wide gap, subapical tooth distinctly shorter and wider than the apical.

Thorax.—Mesoscutum medially longer than wide, finely coriaceous, with sparse, shallow punctation, shiny; basal part of notauli distinct; scutellum flat, laterally not carinate, the sides straight, converging toward the truncate apex; propodeum (fig. 8) generally as in *Apatetor,* the central area, however, medially projecting and smooth, adjacent to postscutellum; areae dentiparae apically confluent with areae posteroexternae; areae coxales obsolete; otherwise carination distinct and complete; separation of horizontal part and declivity indicated, the area posteromedia very short, scarcely one third of length of central area.

Legs.—Femora fairly stout, coxae III of female without scopa.

Wings.—Clear; areolet quadrangular.

Abdomen.—Nearly parallel-sided and somewhat elongate, in female distinctly oxypygous, ovipositor slightly projecting; sculpture of anterior tergites coarse, middle of postpetiole and of tergites 2-4 longitudinally striate-punctate (fig. 9), rest of these tergites strongly and rather densely punctured, the sutures between them pronounced; gastrocoeli large and deep; hypopygium of male slightly projecting in an obtuse, apically blunted angle.

1. *Protoleptops heinrichi,* new species

Figs. 8, 9

Types

Holotype.—♀, "Madagascar, Ivondro, 1.I.40., leg. A. Seyrig". M.N.H.N.
Allotype.—♂, "Madagascar, Rogez, XII.38., leg. A. Seyrig". M.N.H.N.
Paratype.—♀, "Madagascar, Rogez, Forêt cote est, leg. A. Seyrig". C.G.H. II.

Distribution

Madagascar: Ivondro, Rogez.

Preamble

I spotted the type of this species among the unarranged material of the Musée National d'Histoire Naturelle in Paris in the course of type studies preliminary to this monograph. The specimen was recognized as representative of a new species by A. Seyrig, who labelled it "*Apatetor heinrichi,* type" for publication. But the war and his violent death prevented the description. I felt bound to carry out the will of my late friend, rather than to shrink from the possibility of being blamed for self-glorification in using this species name.

Female

Head white, with black dorsal pattern; thorax predominantly ferruginous-red with white and black pattern, including mesoscutum; scutellum with lateral white lines, mesoscutum with short white median lines, abdomen ferruginous, apically black, with white anal pattern; legs ferruginous, all tarsi and, more or less intensly, also the dorsal sides of all tibiae, infuscated; flagellum black with white annulus; length 20 mm.

Flagellum.—With 45 segments, the first about three times as long as wide, the 17th square, the widest fully twice as wide as long. Black with nearly complete white annulus on segments 10-17, segments before annulus dorsally at apices and ventrally extensively brownish.

Head.—Structure as described for genus. White; the following black: antennal cavity, ocellar, occipital and temple regions, black color of the latter extending to the border of eyes; black on ocellar region and on antennal cavity medially connected by a narrow black longitudinal line on frons.

Thorax.—Structure as described for genus. Ferruginous-red, the mesoscutum a shade deeper than pleura and sterna; the following black: basic color of pronotum, patch below subalarum on mesopleura, basic color of scutellum, the lateral areae of horizontal part of propodeum and areae posteroexternae, anterior part of lateral lobes of mesoscutum; the following white: collare, pronotal ridge and base broadly, subalarum, lateral bands on scutellum and its apex narrowly, postscutellum; central area of propodeum, sterna, and prepectus paler ferruginous than the rest.

Legs.—Ferruginous; tarsi II and III blackish, tip of femora III and the tibiae II and III dorsally more or less intensly infuscated.

Abdomen.—Structure as described for genus. Ferruginous; basic color of tergites 6 and 7 black, the sixth with white anal band, the seventh predominantly white.

Male

Color of sterna, prepectus, and anterior coxae still paler than in female, close to whitish; black on sixth tergite reduced to apical band; no white pattern on sixth tergite; otherwise like female; length 18 mm.

Flagellum.—With 41 segments and with narrow longish-oval tyloids on segments 12-20. Black, ventrally brownish, with nearly complete annulus on segments 13-20 (base); scape ventrally white.

6. Genus *Punctileptops*, new genus

Figs. 10, 11

Type species.—*Apatetor robusticeps* Heinrich

Distribution

Madagascar and West Africa (Angola).

Preamble

That the type species belongs to a genus different from *Apatetor blandus* Saussure seems to me now indubitable. More problematic, however, is the question whether it should be incorporated in the genus *Leptophatnus* Cameron as an aberrant species or regarded as representative of a distinct new genus. It shares with *Leptophatnus* most of the structural characters,

differing distinctly only in the neatly and densely punctured first tergite (fig. 11), the laterally not, or only faintly and basally, carinate scutellum and the rather strongly sculptured, punctate and partially rugose-punctate mesoscutum. A second distinct species from West Africa will be described below; this species shares the differences from *Leptophatnus* with the type species and has caused me to evaluate the above mentioned characters tentatively as generic. An additional and perhaps the most important generic distinction is provided by the first flagellar segment, which (in both sexes) is shorter than the second.

Morphological characters

Flagellum.—In female bristle-shaped, ventrally flattened and slightly widened beyond middle, moderately attenuated at apex; of males nodose by transverse bristle ridges on ventral side, without distinct tyloids and sigilla.

Head.—Occiput rather deeply emarginate, frons somewhat concave, cheeks, in lateral view, fairly wide and somewhat swollen; clypeus normal with straight apical border, clearly separated from face; in type species lower part of lateral fields of face distinctly protruding; mandibles of normal structure, but very stout and wide with strong apical teeth, the upper longer than the lower.

Thorax.—Mesoscutum more coarsely sculptured than in all other species of the subtribe known so far: basally coriaceous, with fairly dense, irregular punctation and transverse, irregular rugosity, particularly along sutures between median and lateral lobes, subopaque; median lobe anteriorly slightly more convex and more abruptly declivous toward collare than usually; notauli basally indicated; scutellum dorsally only slightly convex, laterally not (type species), or sometimes partially and weakly, carinate; propodeum similar in structure to *Leptophatnus,* with distinct basal furrow and long, apically moderately slanting horizontal part, the areae dentiparae apically defined; area posteromedia very short compared with length of central area; costulae distinct in type species, obsolete in *amboimensis,* new species.

Legs.—Fairly stout (type species) to fairly slender; coxae III of females without scopa.

Wings.—Clear; areolet quadrangular.

Abdomen.—In female oxypygous; petiole gradually widening into postpetiole, the latter dorsally flat, without median field, densely and neatly punctured, except usually smooth medio-apical area; gastrocoeli small and shallow, with distinct thyridia; second and third tergites evenly and very densely punctured, subopaque; hypopygium of males apically obtuse.

1. *Punctileptops robusticeps* (Heinrich), new combination

Apatetor robusticeps Heinrich, 1938, Mém. Acad. Malgache, XXV, pp. 62-63, ♀.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, I.1931, leg. A. Seyrig". C.G.H. I.

Distribution

Madagascar: Rogez.

Preamble

The species is particularly distinguished by the protuberant lower part of lateral fields of face and the swollen cheeks.

Female

Head white, with dorsal black pattern; thorax light ferruginous, with restricted black and white pattern; scutellum white; abdomen light ferruginous, apically black, tergites 6 and 7 with white anal pattern; legs predominantly ferruginous; flagellum black with white annulus; length 17 mm.

Flagellum.—Structure as described for genus; with 42 segments. the first fully twice as long as wide and much shorter than the second, about the 15th square, the widest twice as wide as long. Black, with complete white annulus on segments 8-16.

Head.—Structure as described for genus; malar space about half as long as width of mandible base; median field of face only slightly convex; lower parts of lateral fields protuberant above clypeus; apical border of the latter without medio-apical projection; face and clypeus sparsely punctured, frons without punctation. White; the following black: antennal cavity, middle of frons broadly, ocellar, occipital and temple region (black color of the latter extending broadly to the border of eyes), apical band on cheeks at mandible base; suture between face and clypeus ferruginous-tinged.

Thorax.—Structure as described for genus; costulae distinct; area centralis widened at costulae, strongly narrowed toward area posteromedia, fairly smooth. Light ferruginous; the following black: pronotum extensively (except posterior upper part), mark on mesopleura below subalarum, lateral slopes of scutella; the following white: collare, pronotal ridge broadly, subalarum, tegulae partially, scutellum.

Legs.—Ferruginous; tarsi II and III and tibiae III infuscated.

Abdomen.—Structure and sculpture as described for genus. Light ferruginous; basic color of tergites 5-7 and the apex of tergite 4 black, the sixth tergite with broad white apical band, the seventh predominantly white; sides of postpetiole and vicinity of gastrocoeli slightly infuscated.

2. *Punctileptops amboimensis*, new species

Figs. 10, 11

Types

Holotype.—♀, "Angola, südl. Gabela, 4.VIII.54." C.G.H. II.
Allotype.—♂, same locality and date. C.G.H. II.
Paratype.—♂, same locality and date. C.G.H. II.

Distribution

Angola: Gabela (district of Amboim).

Preamble

This species is not very closely related to the type species from Madagascar; the head-structure is less strong, the structure of the face is different and quite normal, the chromatic pattern differs strongly and the legs are longer and much slenderer.

Female

Head black with white pattern, middle of clypeus and face broadly blackish-brown; thorax black and dull orange; median lobe of mesoscutum, scutella, central area of propodeum, mesosternum, mesopleura, and metapleura dull orange; abdomen predominantly black; second tergite with whitish apical margin, sixth tergite with white apical band, seventh with large white anal mark; legs III, including coxae, predominantly black with partially white tarsi; legs I and II predominantly ferruginous and brown; flagellum black with white annulus; length 17.5 mm.

Flagellum.—Structure as described for genus; with 43 segments, the first about 2.5 times as long as wide and distinctly shorter than the second, about the 16th square, the widest scarcely wider than long. Black, with dorsal white annulus on segments 9-18, segments before annulus apically narrowly brownish.

Head.—Structure as described for genus; malar space scarcely half as long as width of mandible base; median field of face only slightly convex, lateral fields normal and flat, not at all protuberant above clypeus, median part of apical border of clypeus very slightly obtusely projecting; lower tooth of mandible wide and blunt, not separated from upper tooth by a distinct gap (as present in the male); face and basal part of clypeus distinctly and rather densely punctured, frons without punctation. Black; the following white: base of mandibles, sides of clypeus, lateral fields of face, upper part of frontal and the vertical orbits broadly, large marks on apex of cheeks; middle of clypeus and face brownish-black.

Thorax.—Structure as described for genus; costulae obsolete; area centralis with almost straight lateral carinae, elongate, slightly narrowed toward apex, transversely rugose (fig. 10); rest of propodeum coarsely and densely rugose-punctate. Dull orange; the following black: prosternum, pronotum, subalarum and patch below it, lateral areae of horizontal part of propodeum, including areae spiraculiferae, lateral slopes of scutella; lateral lobes of mesoscutum predominantly blackish infuscated.

Legs.—Long, femora slender. Legs III black, including coxae, their tarsi from about middle of second segment to beyond middle of fifth white, the metatarsus and apex of fifth segment black, apex of metatarsus and base of second tarsal segment partially pale; legs I and II including coxae and trochanters light ferruginous, their tarsi blackish with ferruginous apices of segments, the tibiae, femora, and trochanters dorsally infuscated.

Abdomen.—Structure and sculpture as described for genus. Black; apex of second tergite narrowly whitish, sixth tergite with white apical band, the seventh with large white anal mark.

Male

There are two males from the type locality, of which one agrees almost exactly with the holotype chromatically; this specimen has been designated as the allotype and described below. The other specimen, which probably represents a mere mutant, is mentioned at the end of this treatment as var. 1 ♂.

Face and clypeus uniformly white; no white mark on apex of cheeks, instead indication of a small, light mark on lower, outer orbits; sixth tergite without white anal pattern, the white apical band of second tergite, however,

not narrow as in female, but medially strongly widened and of obscure, whitish-orange color; a patch of the same color on the medio-apical part of the third tergite; otherwise exactly like female; length 15.5 mm.

Flagellum.—Structure as described for genus, the first segment somewhat shorter than the second. Black, ventrally brownish, with nearly complete white annulus on segments 15-22.

Head.—Lower tooth of mandible longer and more pointed than in female, thus forming a rather distinct gap.

Var. 1. ♂

Propodeum almost uniformly black, except for a ferruginous mark on apical part of metapleura; only a short anterior part of central area with distinct lateral carinae, all the rest obsolete by coarse sculpture. Otherwise exactly like allotype.

7. Genus *Apatetorides* Heinrich

Apatetor Saussure, subgenus *Apatetorides* Heinrich, 1938, Mém. Acad. Malgache, XXV, p. 66.

Type species.—*Apatetorides variabilis* Heinrich, monobasic.

Distribution

Probably confined to Madagascar.

Preamble

The type species is distinguished by a number of important characters from *Apatetor* Saussure and should certainly be considered representative of a different genus. The structure of mandibles, with the subapical tooth bent moderately, but nevertheless distinctly, out of the plane of the apical tooth, is unique in the subtribe Apatetorina. Additional differences from *Apatetor* are the structure of propodeum (see below), entire lack of notauli, structure of clypeus (see below), size and depth of gastrocoeli, aciculate sculpture of anterior tergites, and lesser degree of sclerotization of posterior tergites. In most of these characters, particularly in propodeal structure, this genus shows the closest relationship to the new genus *Apatetorops,* described further on in this synopsis, from the African continent. Also some chromatic pattern which both groups have in common, confirm their relation: the combination of extensive white anal pattern with rich white marks or bands on anterior tergites, the lack, or restriction, of white coloration on scutellum, the occurance of white tarsal pattern. The genus from the African continent is distinguished, however, by stout mandibles with strong, normal teeth and by distinct base of notauli.

Morphological characters

Flagellum.—Of females bristle-shaped, very slender, scarcely widened beyond middle, strongly attenuated apically; of males slightly nodose, with transverse bristle ridges on ventral side, and with very small, subrudimental white tyloids.

Head.—Temples rather wide behind eyes, with strongly curved outline; cheeks wide in lateral view, distinctly swollen; malar space a little shorter than width of mandible base; mandibles gradually tapering to the

pointed apex, with small subapical tooth which is not in the same plane with the apical tooth and separated from it only by a small notch; clypeus without lateral corners, laterally obliquely rounded and a trifle thickened, medially very slightly emarginate; median field of face scarcely raised.

Thorax.—Mesoscutum short, medially of about equal length and width, without trace of notauli; scutellum dorsally flat, gradually slanting from base to postscutellum, laterally not carinate; propodeum slanting in a long, gradual curve from base to apex and also from the middle towards the sides; central area long and narrow, slightly narrowed from base to apex; areae dentiparae, superoexternae, and spiraculiferae confluent, the costulae and longitudinal lateral carinae, except carinae metapleurales, obsolete or subobsolete; basal furrow of propodeum subobsolete. In males areae dentiparae usually more distinctly limited and scutellum more convex.

Legs.—Moderately stout; coxae III of females with small scopa.

Wings.—Clear; areolet quadrangular.

Abdomen.—Median field of postpetiole fairly distinct, longitudinally striate; gastrocoeli large, moderately deep, with pronounced thyridia, space between them narrower than one of them, striate; middle of second tergite aciculate, the sides, however, smooth and impunctate, as is the rest of the abdomen; tergites weakly sclerotized, particularly the apical ones, which therefore often lose their natural shape in prepared specimens.

1. *Apatetorides variabilis* Heinrich

Apatetorides variabilis Heinrich, 1938, Mém. Acad. Malgache, XXV, pp. 66-67, ♀♂, and 3 variations of ♀♀, 1 of ♂; also pl. I, fig. 2, color, ♀, and drawing of face, pl. IV, fig. 21.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, I.-II.1931, leg. A. Seyrig". C.G.H. I.

Allotype.—♂, "Madagascar, Ankaratra Geb. 1800 m, XII.-II., leg. A. Seyrig". C.G.H. II.

Distribution

Madagascar: Rogez, Montagne d'Ambre, Ankaratra, Vatondrangy, Ampandrandava. A rather common inhabitant of the mountains, very seldom found in dry habitats (as Ampandrandava).

Female

Head white with dorsal black pattern; thorax white and black, at least mesoscutum predominantly or entirely red; scutellum red, varying sometimes to partially or entirely white; propodeum sometimes predominantly red; abdomen black, second tergite with broad apical white band, tergites 5-7 with apical white bands, sometimes also postpetiole white marked; occasionally basic color of tergites 1-3 reddish; legs predominantly red, tarsi III with white annulus; flagellum black with white annulus; length 12 mm.

Flagellum.—Structure as described for the genus; with 37-40 segments, the first fully 4 times as long as wide, about the 16th square, the widest twice as wide as long. Black, with white dorsal annulus on segments 7 (apex) to 16 or sometimes 17, basal segments to annulus apically narrowly brownish; scape ventrally white.

Head.—Structure as described for the genus. White; the following black: antennal cavity, middle of frons broadly, ocellar region, occipital and temple regions, black of the latter projecting broadly to the border of eyes.

Thorax.—Mesoscutum extremely finely coriaceous, shiny, without notauli; scutellum smooth; propodeum rather strongly and densely punctured, central area smooth. Pronotum, mesoscutum, and scutellum ferruginous-red; basic color of propodeum and upper part of mesopleura black or blackish, varying sometimes to ferruginous; the following white: pronotal ridge narrowly at apex only or in whole length, sometimes pronotal base narrowly, subalarum, postscutellum, sometimes scutellum partially or entirely, more or less extensive W-pattern on apex of propodeum, apex of areae metapleurales more or less extensively, sterna entirely, about lower half of mesopleura.

Legs.—Coxae III with small scopa. Ferruginous-red; the following white: coxae and trochanters I and II, coxae III usually narrowly on ventral side, on outer and inner sides toward apex, and dorsally on inner side extensively, segments 3 and 4 and sometimes apex of second segment of tarsi III; rest of tarsi III and the tarsi II distinctly, tibiae II and III slightly infuscated; basic color of coxae III varying from ferruginous to black; sometimes all coxae predominantly ferruginous.

Abdomen.—Middle of postpetiole in majority of specimens aciculate, sculpture varying sometimes to irregularly or indistinctly rugose; base of second tergite between gastrocoeli depressed; middle of second tergite aciculate. Black; the following white: sometimes apical mark on postpetiole, always a broad, even apical band on second tergite, regular apical bands on tergites 5-7 and on last three sternites; basic color of sternites white, of last three black; in some mutants basic color of tergites 1-3 ferruginous.

Male

Scutellum usually predominantly to entirely white; white annulus on tarsi III more extensive than in female, in allotype on segments 2-5; white apical band on fifth tergite obsolete, on sixth restricted; white apical pattern on propodeum and white markings on coxae III lacking in allotype; white patches on pronotum more extensive than in female; basic color of pronotum, and on apex of mesoscutum black; otherwise like the female; length 12-13 mm.

Flagellum.—With subrudimental punctiform white tyloids on segments 15-19. Black, with white annulus on segments 15 or 16 to 23; scape ventrally white.

8. Genus *Apatetorops*, new genus

Fig. 13

Type species.—*Apatetorops magnificus*, new species

Distribution

Eastern and western Africa: Tanganyika (Western Usambara Mts., at 1600 m); Transvaal; Cape Province; Angola. Tropical jungles.

Preamble

Structurally distinguished mainly by the incomplete carination and the shape of propodeum (fig. 13) which, as in *Apatetorides* Heinrich, slopes gradually and continuously down from postscutellum to apex and also from the central area to the sides; the areae superoexternae, spiraculiferae, dentiparae, and posteroexternae completely confluent, or only partially and indistinctly limited; areae basalis and superomedia confluent, forming an elongate polished central area which is wide anteriorly and contiguous (or almost so) to the postscutellum, tapering gradually and strongly toward the area posteromedia; the latter strongly narrowed anteriorly and usually sharply projecting into apex of area centralis; anterior tergites in typical species sharply aciculate or longitudinally rugose; gastrocoeli fairly large and deep, scutellum laterally not carinate—all these characters also agreeing with *Apatetorides;* mandibles, however, entirely different: wide and stout, not tapering toward apex, with strongly developed apical teeth, in same plane with each other, separated by a distinct-to-wide gap, the upper somewhat longer than the lower.

The *Apatetorops* species described below, are large and handsome insects, almost twice as large as *Apatetorides,* all sharing parallel chromatic pattern with *Apatetorides:* rich white markings on anterior tergites combined with white anal pattern and often white annuli on tarsi III; scutellum not, or only partially white.

I do not doubt the true relationship of *Apatetorops* and *Apatetorides;* the mandible-structure of the two, however, is so strongly different, that I consider their generic distinctness beyond question. This assumption is also supported by a strong difference in structure of the clypeus.

Morphological characters

Flagellum.—Of females bristle-shaped, very long and slender, slightly widened beyond middle, strongly attenuated at apex; of males long, nodose, with transverse bristle ridges on ventral side and with small, bacilliform or longish-oval tyloids.

Head.—Temples rather narrow behind eyes, with slightly curved or straight outline; cheeks in lateral view moderately wide, not, or scarcely swollen; malar space shorter than width of mandible base; mandibles stout and wide, the two apical teeth, as normally, in same plane with each other, strongly developed, separated by a distinct gap, the upper tooth somewhat longer than the lower; clypeus normal, with straight apical border, medio-apically a trifle projecting, basally sometimes a trifle convex; median field of face only very slightly raised.

Thorax.—Mesoscutum medially distinctly longer than wide; notauli distinct but short; scutellum dorsally flat, laterally not carinate, its straight sides gradually narrowed toward apex, which is truncate; propodeum as described in preamble, strongly and rather densely punctured, except polished central area.

Legs.—Very long and slender; coxae III of known females with scopa; tarsi III in most species with white annulus.

Wings.—Clear; areolet quadrangular.

Abdomen.—Of females oxypygous; median field of postpetiole fairly distinct, in typical species longitudinally striate or rugose, as is the middle of second tergite; gastrocoeli of medium size and depth, with distinct thyridia; hypopygium of males only slightly projecting in an obtuse angle.

Key to the species of *Apatetorops* Heinrich
Females and Males

1. Scutellum with white lateral bands, medially red or black; second tergite medially extensively and strongly longitudinally striate. (Tarsi III without white pattern; in females basic color of mesoscutum blood-red and coxae III with large scopa; in both sexes tergites 1 and 2 with white apical bands, the third with white latero-apical marks; length 16-17 mm.) ..... 1. *magnificus*, new species
Northern Tanganyika, Cape Province

Scutellum without white lateral bands; second tergite not longitudinally striate. 2

2. Tarsi III extensively white in both sexes; mesosternum predominantly orange or black. (In females clypeus white, face black, frons with broad, continuous transverse white band; in both sexes tergites 1 and 2 with white apical bands; length 15.5-20 mm.) ..... 2. *angolae*, new species
Northwestern Angola

Tarsi III without white pattern; mesosternum uniformly white. (Mesoscutum and scutellum bright orange-red; tergites 1 and 2 with white apical bands, the third with white latero-apical marks; length 18 mm.) ..... 3. *farquharsoni*, new species (♂ only)
Cape Province

1. *Apatetorops magnificus*, new species

Fig. 13

Types

Holotype.—♀, "Tanganyika, Western Usambara Mts., Lushoto, 1700 m, 19.II.62." C.G.H. II.

Allotype.—♂, same locality, 17.II.62. C.G.H. II.

Paratypes.—1 ♀, same locality, 1600 m, 5.III.62; 5♂♂, same locality, 1700 m, 17.II.62; 1♂, Cape Province, Pt. St. Johns, 20.II. 63. C.G.H. II.

Distribution

Northern Tanganyika (Western Usambara Mts., 1600-1700 m); Cape Province (Pt. St. Johns, at sea level).

Preamble

The laterally white scutellum, lack of white tarsal annulus, almost entirely (female) or partially (male) blood-red basic color of thorax, and the scopa on a white mark on coxae III of female distinguish this species from all others of this genus.

Female

Basic color of thorax and dorsal part of head blood-red, with very rich white pattern; scutellum with longitudinal red band, laterally white; abdomen black, tergites 1-2 with conspicuous white apical bands, the third with large apico-lateral marks, the sixth with narrow apical band, the seventh predominatly white; femora III blood-red, rest of legs predominantly black, with white pattern; flagellum black with white annulus; length 16 mm.

Flagellum.—Structure as described for genus; with 44 segments (in both specimens), the first about 5 times as long as wide, about the 17th square, the widest about twice as wide as long. Black, with full white annulus on segments 8 (apex) to 17 or 18; basal segments to annulus apically narrowly brown; scape ventrally white.

Head.—Temples rather distinctly narrowed behind eyes, with slightly curved outline; cheeks in lateral view moderately wide, not swollen; malar space about half as long as width of mandible base; clypeus basally slightly convex; face and clypeus shiny and rather smooth, with some scattered, shallow punctures. White, with red and black pattern; black or blackish are: a medio-apical spot on clypeus, antennal cavities, temple region (the black extending broadly to the margin of eyes), and posterior part of cheeks below temple region; the following red: sutures between face and clypeus narrowly, a narrow, short longitudinal line on upper part of median field of face, middle of frons broadly, ocellar region, and occipital region.

Thorax.—Structure as described for genus; anterior sixth of notauli distinct; mesoscutum very finely coriaceous, impunctate, moderately shiny; scutellum polished; mesopleura, except speculum, fairly finely and densely punctured. Blood-red; the following white: collare, pronotal ridge, pronotal base apically more or less extensively, subalarum, tegulae, two short median lines on mesoscutum, sides of scutellum, apex of prosternum, exterior border of prepectus, medio-apical marks on each side of mesosulcus on mesosternum, a band triangularly surrounding the anterior lateral part of mesosternum between sternauli and mesopleura, sometimes extending along lower border of the latter toward their apex.

Legs.—The femora III, except blackish tip, and basic color of coxae III red; tibiae and tarsi III blackish to black; legs I and II blackish-brown, the femora and tibiae ventrally ivory; the following white: coxae and trochanters and trochantelli I and II, trochanters III, ventral mark on coxae III (bearing the scopa), large, dorsal mark on coxae III; coxae III more or less extensively blackish-infuscated; trochantelli III red and/or blackish.

Wings.—Clear.

Abdomen.—Structure as described for genus; median field of postpetiole fairly distinct, strongly longitudinally striate; middle of second tergite extensively, the middle of third tergite only basally striate; rest of second and third tergites finely coriaceous and shiny, with sparse, shallow punctation on lateral parts. Black; the following white: broad, even apical bands on first and second tergites, large, approximately triangular apicolateral marks on third tergite, narrow apical band on sixth, and most of the seventh tergite.

Male

More melanistic than female.

Head largely white, with red dorsal pattern of female replaced by black; lateral lobes of mesoscutum black, propodeum uniformly black (extensively red only in the specimen from South Africa); red on propleura and mesopleura more or less reduced; sterna and lowest part of mesopleura uniformly white; white band on sixth tergite obsolete; basic color of legs including femora III and coxae III black, with white pattern as in female; flagellum black with white annulus; length 16-17 mm.

Flagellum.—With very small, short, narrowly-oval tyloids on segments 12 to 20 or 21. Black, with complete white annulus on segments 20 (apex usually) to 29, or usually 30, rarely even to 33; scape ventrally white.

2. *Apatetorops angolae*, new species

Types

Holotype.—♀, "Roça Canzele, Angola, 30 km nördl. Quiculungo, III.54." C.G.H. II.

Allotype.—♂, same locality and date. C.G.H. II.

Paratype.—1 ♀, same locality and date. C.G.H. II.

Distribution

Northwestern Angola, north of Quiculungo: tropical jungle.

Preamble

A typical species of this genus with extensively white tarsi III in both sexes. Females are chromatically well distinguished by the dull-orange colored median lobe of mesoscutum, central area of propodeum, scutella, mesopleura and metapleura, furthermore by the white frons and uniformly or extensively white clypeus combined with black face; coxae III with scopa. The species displays a rather strong sexual dichroism, as the thorax of the male is entirely black.

Female

Black; tarsi III predominantly white; thorax with extensive dull orange, but without white pattern; frons with broad white transverse band, surrounding anterior part of ocellar triangle, clypeus extensively or entirely white; tergites 1-3 with apical and lateral white bands, tergites 6-7 with large white anal marks; flagellum black, with dorsal white annulus; length 18-20 mm.

Flagellum.—Structure as described for genus; extremely long and attenuated; with 45-51 segments, the first about 5 times as long as wide, about the 14th square, the widest twice as wide as long, the last 10 segments distinctly longer than wide. Black, with white dorsal annulus on segments 9 (apex) to 18.

Head.—Frons distinctly concave up to vertex; temples and occiput fairly steeply declivous, temples distinctly narrowed behind eyes, with straight outline; cheeks in lateral view fairly narrow and not at all swollen; carinae oralis and genalis normal and straight; malar space somewhat longer than half of width of mandible base; clypeus basally slightly convex; face, particularly the median field, finely and moderately densely punctured, clypeus nearly smooth, shiny. Black; the following white: a broad medially uninterrupted transverse band on frons, reaching from orbit to orbit, surrounding the anterior part of ocellar triangle above and the upper border of antennal cavities in a double arch below, a mark or short line on upper facial orbits nearly level with base of antennae, base of mandibles, sometimes a small mark on lower outer orbits, and either the entire clypeus together with the lowest part of lateral fields of face (next to clypeal foveae), or only the sides of clypeus extensively.

Thorax.— Structure as described for the genus; notauli less developed than in type species, slightly indicated at the very base only; mesoscutum finely coriaceous, with sparse, shallow punctation; scutellum smooth, dorsally fairly flat, slightly raised above postscutellum and apically gradually sloping to the latter. Black; the following dull-orange: median lobe of mesoscutum, prescutellar carinae, scutella (including lateral slopes), entire central area of propodeum from postscutellum to petiole, apex of prosternum, mesopleura and metapleura uniformly, entire prepectus, mesosternum except a longitudinal median black band which is apically considerably widened.

Legs.—Femora very long and slender; coxae III ventrally very densely punctured, with distinct scopa. Black; coxae I and II whitish-orange, with black dorsal mark; trochanters I and II ventrally entirely whitish, their apico-dorsal margin white; coxae and trochanters III black, trochanters III with white apical margin, sometimes also ventrally whitish; tarsi III white, except basal half of metatarsus black; femora and tibiae I and II ventrally pale orange; tibiae III brownish toward base.

Abdomen.—Median field of postpetiole and base of second tergite medially strongly longitudinally striate; second and third tergites, except apically, very densely rugose-punctate and subopaque. Black; the following white: sides of tergites 1-3 narrowly, sometimes basal part of petiole, apical bands on tergites 1-3 (the one on the third tergite sometimes extensively infuscate), apical band on the sixth and most of the seventh tergite.

Male (tentative)

Much more melanistic than female; face, however, predominantly white; outline of temple profile not quite straight as in female but distinctly curved.

Thorax uniformly black, including scutella; head black, the transverse white band on frons medially interrupted, thus forming two large marks on frontal orbits; face and clypeus white, the former with black sutures between median and lateral fields; white pattern on abdomen reduced; white apical bands on third and sixth tergite obsolete, on seventh tergite medially broadly interrupted; legs as in female; length 15.5 mm.

Flagellum.—With 41 segments and with short, longish-oval tyloids on segments 11-20. Black, with dorsal white annulus on segments 15-25.

3. *Apatetorops farquharsoni*, new species

Types

Holotype.—♂, "Northern Cape Province, King Williams Town, Peeree Forest, 6.III.62, leg. F. L. Farquharson". C.G.H. II.

Distribution

Eastern Cape Province.

Preamble

Another typical species of this genus, chromatically distinguished by the white face, cheeks, and sterna, uniformly black tarsi III and metapleura, bright orange-red mesoscutum and scutella.

Male

Head white with black dorsal pattern; thorax black, mesoscutum and scutella bright orange-red, sterna and lowest part of mesopleura pure white; abdomen black with white pattern on tergites 1-3 and 6-7; legs, including entire tarsi III black, coxae and trochanters extensively white; flagellum black with white annulus; length 18 mm.

Flagellum.—With 45 segments and with small longish-oval tyloids on segments 13-20. Black, with complete white annulus on segments 19-28; scape ventrally white, basal segments ventrally brownish.

Head.—Temples only slightly narrowed behind eyes, with curved outline; face, clypeus and lower part of cheeks distinctly and rather densely punctured. Black; the following white: mandibles except teeth, clypeus, face, lower half of cheeks, frontal orbits (narrowly below, widened above below lower ocellus).

Thorax.—Notauli distinct at base; mesoscutum extremely finely coriaceous, with scattered, shallow punctures; scutellum moderately strongly raised above postscutellum, gradually sloping apically to the latter, laterally not carinate. Black; bright orange-red are: about upper third of pronotum, mesoscutum, scutella, prescutellar carinae; the following white: subalarum, sterna uniformly, lower part of mesopleura, and prepectus (except large, black mark on each side); central area of propodeum dull ferruginous.

Legs.—Femora long and slender. Black; the following white: all trochanters almost entirely, coxae I and II almost entirely, coxae III ventrally, femora and tibiae I and II ventrally.

Abdomen.—Middle of postpetiole and space between gastrocoeli longitudinally rugose; rest of second and most of third tergites strongly and densely rugose-punctate. Black; the following white: apex of postpetiole, apical band on second tergite, large latero-apical marks on third tergite, apical margin of sixth, and most of seventh tergite.

9. Genus *Leptophatnus* Cameron

Figs. 12, 14-18

Leptophatnus Cameron, 1906, Ann. South Afr. Museum, V, pp. 165-166.

Type species.—*Leptophatnus ruficeps* Cameron, monobasic.

Distribution

The majority of species inhabit tropical and subtropical Africa; two species are recorded from Madagascar, only one seems to have extended its range as far south as Cape Town.

Preamble

This is one of the most characteristic genera of the Ethiopian region, on account of the large number of species which it has produced as well as for their striking appearance and size. The type species is one of the largest and most conspicuous forms of the subfamily. The combination of the following principal characters establishes the diagnosis of this genus:

1. Propodeum (fig. 16) with distinct basal furrow and with usually almost complete carination, only the areae superomedia and basalis always being confluent and the area coxalis lacking; central area in front of costulae

parallel-sided or slightly narrowed, behind costulae more strongly narrowed, more or less distinctly angularly widened at costulae (in a few species, however, carination partially obsolete by coarse sculpture); carinae dentiparae interiores always, exteriores often distinct, the rather wide areae dentiparae consequently apically well separated from areae posteroexternae.

2. Postpetiole and middle of second tergite never strongly or even distinctly aciculate, the former usually laterally punctured, medially finely rugose or indistinctly striate, often almost smooth.

3. Scutellum dorsally convex, always laterally carinate, usually moderately or slightly, in type species, however, strongly elevated above postscutellum.

4. Mandibles robust, wide, with large apical teeth, with distinct gap between the shorter and wider subapical and the longer and pointed apical tooth.

5. The flagellum of males bears a row of tyloids, and in the majority of species, but not in the type species, also a dorsal and ventral row of peculiar structures described in the introduction to this paper (section "terminology") under the newly introduced term "sigilla". The sigilla occur in an inconspicuous form also in a few closely related groups of the Apatetorina, but are particularly pronounced in most of the species of *Leptophatnus*. They thus represent, where present, a complementary character, useful for the identification of the species of this genus.

Chromatically, this group shows a tendency to restriction of white pattern on head and thorax, while the presence of white anal marks is the rule; the basic color is black or ferruginous-red; white markings on anterior tergites occur occasionally; in the type and two other species the wings are deeply infuscated, in the majority of the species clear; extensively white tarsi III occur in both sexes or, in some species, in the males only.

Leptophatnus is closely related to the Oriental genus *Cratojoppa* Cameron (1901), but differs structurally by the convex, laterally always clearly carinate scutellum.

Morphological characters

Flagellum.—Of females long, bristle-shaped, ventrally flattened and more or less widened beyond middle, fairly strongly attenuated toward apex; of males nodose by subapical bristle ridges on ventral side, with row of short, oval tyloids and on ventral as well as on dorsal side usually with distinct-to-pronounced sigilla of specifically varying size and shape of outline.

Head.—Temples and cheeks in type species not, in the majority of other species, however, distinctly swollen; median field of face indicated, only slightly convex; clypeus normal, its base a trifle convex, medio-apically imperceptibly projecting; mandibles as described in preamble.

Thorax.—Mesoscutum medially somewhat longer than wide, usually sparsely punctured; about anterior fourth or fifth of notauli distinct; scutellum slightly to strongly (type species) raised above postscutellum, dorsally convex, always laterally carinate and slightly bulging; horizontal part of propodeum distinctly longer than declivity, with fairly pronounced basal furrow, although the middle of central area usually has a small projection

toward postscutellum; central area as described in preamble; costulae usually distinct, as are the carinae dentiparae interiores; areae coxales and carina separating area superomedia and basalis always, carinae dentiparae exteriores sometimes obsolete; rarely other parts of carination extensively obsolete by coarse sculpture; in type species posterior narrowed part of central area distinctly protuberant above surface of propodeum.

Legs.—Fairly slender to moderately robust; coxae III of females usually with scopa.

Wings.—Of type species and a few others, strongly infuscated with purple or blue reflection, in the majority of species clear; areolet quadrangular.

Abdomen.—Of females oxypygous; postpetiole without distinct median field, moderately convex, laterally usually punctate, medially almost smooth or finely rugose or indistinctly aciculate; gastrocoeli small to moderately large and moderately deep, with distinct thyridia; second and third tergites usually densely punctured, sometimes rugose-punctate, never clearly aciculate; hypopygium of males medially projecting in an obtuse angle.

Key to the species of *Leptophatnus* Cameron

a. Females

1. Wings strongly and evenly infuscated. (Coxae III sometimes without scopa.) 2
   Wings not, or only slightly infuscated. (Coxae III always with scopa.) 7
2. Head, body, and legs uniformly dark ferruginous except for white anal mark on seventh tergite and white annulus on flagella and tarsi III. (Strong scopa on coxae III; length 18 mm.) ..... 5. *alluaudi* (Heinrich) Mt. Kenya, Mt. Meru
   Thorax and abdomen entirely or predominantly black. 3
3. Femora, tibiae, and tarsi red; head extensively black. (No scopa; no white anal mark; flagellar annulus in type on segments 12 (apex) to 15; length 23 mm.) ..... 1. *nigrocyaneus* (Tosquinet) Abyssinia
   Legs black; head red or orange 4
4. Tarsi III black; no distinct scopa; an inconspicuous, shallow, vertical furrow on middle of frons below ocelli. (Temple profile narrowed; carination of propodeum very prominent; seventh tergite with white anal mark; sometimes narrow white apical band on sixth tergite; length 18-23 mm.) 5
   Tarsi III extensively white; large scopa present; no trace of furrow on frons below ocelli. (Temple profile wide, broadly rounded; carination of propodeum usually indistinct or subobsolete; length 18-22 mm.) 6
5. Head orange. ..... 2a. *crococephalus crococephalus* (Tosquinet) South Africa
   Head blood-red. ..... 2b. *crococephalus rubricaput* (Morley) Tanganyika, Uganda, N.E. Angola, Rhodesias
6. No white anal pattern. (Pronotum and anterior part of median lobe of mesoscutum usually partially dark red.) ..... 4. *bucephalus* Morley Southern and central East Africa
   White anal mark present. ..... 3. *faustus* (Tosquinet) Togo, Nyasaland, Tanganyika, Kenya
7. Pronotal ridge and base uniformly white. (Face and clypeus white.) 8
   Pronotal ridge and base not uniformly white. (Sometimes pronotal ridge orange-yellow.) 9
8. Postpetiole striate, second tergite coarsely rugose punctate, gastrocoeli deep; sides of clypeus rounded; basic color of first and last tergites black, large white lateral apical marks on third and white anal pattern on last three tergites. (Scutellum white, laterally sharply carinate throughout; length

14 mm.) ..... 19. *separatus* (Heinrich)
Madagascar

Postpetiole not striate, medially finely coriaceous-rugose, second tergite finely punctured, gastrocoeli rather shallow; clypeus normal; abdomen uniformly ferruginous-red, only apical margin of last tergite whitish. (Scutellum orange, laterally weakly carinate to beyond middle; length 16 mm.) .....
..... 18. *simplex*, new species
Eastern Tanganyika: Uluguru Mts.

9. At least tergites 1-2, sometimes more tergites, or basic color of entire abdomen clearly ferruginous or red. (Thorax uniformly or predominantly so colored.) 10

Basic color of abdomen black, at the most the first tergite clearly ferruginous or red. 15

10. Only tergites 1 and 2 ferruginous or red, basic color of the following tergites black. 11

Abdomen less extensively black. 12

11. Sculpture of areae dentiparae extraordinarly coarse and prominent (fig. 14), reticulate-rugose; area centralis rendered indistinct or obsolete by coarse sculpture; basal furrow of propodeum pronounced; thorax, coxae I and II, and tergites 1 and 2 ferruginous without any white pattern; large species, 18-20 mm long. (Head ferruginous, with large white frontal marks; white anal pattern on tergites 6 and 7.) ..... 6. *carinicrobes* (Morley)
Zululand, Nyasaland, n. Tanganyika

Sculpture of areae dentiparae normal (fig. 19); area centralis clearly defined, elongate, and smooth, anteriorly adjacent or almost adjacent to postscutellum, widest at postscutellum and gradually narrowed from the wide base to the narrow apex ("wedge-shaped"), its lateral furrows straight, not widened at costulae; thorax, coxae I and II, and anterior tergites, or one of them, with white pattern; smaller species. .....
..... see genus *Pseudophatnus*, new genus

12. Tarsi III with white pattern. (Head and thorax ferruginous, the former with rich, the latter with very restricted white pattern; tergites 3-6 apically infuscated, seventh tergite with white anal mark, the sixth and first with narrow apical bands; coxae I and II white; length 16-17 mm.) .....
..... 10. *angolator*, new species
Northwest Angola

Tarsi III without white pattern. 13

13. Tergites 5-7 with white anal pattern; anterior tergites without white apical margins; face, clypeus, and cheeks without white pattern. (Tergites 1-4 uniformly ferruginous, the following tergites usually infuscated before white apical pattern; length 16-18 mm.) ..... 8. *triplicator* (Morley)
Nyasaland

Only tergites 6 and 7 with white anal pattern. ..... 13a.

13a. Clypeus and face red, without white pattern. (White patch on lower part of outer orbits; tergites 1-3 red, without white apical pattern; mandible base and frontal orbits white; length 14 mm.) .....
..... 15. *pseudominor*, new species, variation
Natal

Clypeus and face entirely white. (Cheeks partially white; anterior tergites usually with white apical margins.) 14

14. Coxae I and II predominantly, all trochanters ventrally white; mesoscutum finely and moderately sparsely punctured, orange, the lateral lobes infuscated; postpetiole medially longitudinally rugose. (Length 17 mm.) .....
..... 13. *poecilicolor*, new species
Cape Province

Coxae and trochanters without white pattern; mesoscutum with very few, widely scattered, fine punctures, uniformly ferruginous; postpetiole medially very finely, irregularly rugose. (Length 16-19 mm.) .....
..... 9. *madagascariensis* (Heinrich)
Madagascar

15. Tarsi III with white pattern; only seventh tergite with white anal mark, the sixth at the most with very narrow white apical margin. (White apical or apico-lateral margins on one or several of anterior tergites.) 16

Tarsi III without white pattern; sixth and seventh tergites with conspicuous white anal pattern. 17

16. Head black, with white frontal pattern only; clypeus red; carina oralis does not meet carina genalis near mandible base, the former being apically obsolete. (Thorax predominantly dull orange; length 18 mm.) ..... 17. *gabunensis*, new species
Gabon

Head uniformly vivid red, with white frontal and facial pattern; carina oralis meets carina genalis as usual, near mandible base. (Thorax predominantly ferruginous-red; length 17 mm.) ..... 7. *xanthocephalus* (Brullé)
Cape Province

17. Tergites 1-3 with large white latero-apical marks; area coxalis distinct; areae dentiparae not curved downward apically. (Scopa fairly small and not dense.) ..... see genus *Pseudocillimus* Roman

Tergites 1-3 sometimes with narrow white apical margins, but not with large white latero-apical marks; areae coxales obsolete; areae dentiparae apically distinctly curved downward. (Scopa medium-sized to large, dense; tergites 6 and 7 with white anal pattern.) 18

18. Sterna and propodeum entirely, pleura partially to predominantly black. 19
Basic color of thorax ferruginous or red, including sterna, propodeum, and pleura. 20

19. Head predominantly black, with white pattern on mandibles, clypeus, face, frons, and cheeks; mesoscutum and scutellum dull orange; robust species, 18-19 mm long. ..... 11. *citriconiger*, new species
Eastern Tanganyika: Uluguru Mts.

Head uniformly red, only a short whitish line on frontal orbits; mesoscutum and scutellum vivid red; slenderer species, 16 mm long. ..... 16. *melanisticus*, new species
Northeast Angola

20. Face and clypeus white; large species, 15-19 mm long. (Tergites 1-3 with white apical margins.) 21
Face and clypeus entirely or predominantly red; smaller species, 13-14 mm long. 22

21. White marks on vertical orbits clearly separated from white on frontal orbits; coxae I and II predominantly, all trochanters ventrally white; femora III distinctly stouter and shorter than in *madagascariensis* var. (Length 15 to 18 mm.) ..... 12. *ulugurus*, new species
Eastern Tanganyika: Uluguru Mts.

White marks on vertical orbits not separated from white on frontal orbits; coxae and trochanters without white pattern; femora III distinctly longer and slenderer than in *ulugurus*. (Length 16-19 mm.) ..... 9. *madagascariensis* (Heinrich), *var.*
Madagascar

22. Area centralis elongate ,smooth, contiguous anteriorly to postscutellum, widest at postscutellum and gradually narrowed from the wide base to the narrow apex ("wedge-shaped"), its lateral carinae straight, not widened at costulae; second tergite with small latero-apical white marks. (Abdomen black, tergites 6 and 7 with white anal pattern; length 13 mm.) ..... *Pseudophatnus glabrinotor* (Morley)
Nyasaland, southwest Tanganyika

Area centralis not elongate, rugose, separated from postscutellum by distinct basal furrow, slightly angularly widened at costulae and narrowed from costulae toward apex and usually also toward base. 23

23. Head and thorax red, except narrow white stripe on frontal orbits and white postscutellum and subalarum; cheeks and temples (fig. 17) more swollen than in *pseudominor* (fig. 18). (First tergite not clearly red; no white

apical margins on anterior tergites; length 13 mm.) ..... 14. *minor*, new species
Southwest Tanganyika

Head and thorax red except white stripes on frontal orbits, large mark on lower part of outer orbits, mandible base, and postscutellum; subalarum not white; cheeks and temples (fig. 18) less swollen than in minor. (First tergite clear red; apex of second tergite laterally with narrow white margin; length 13.5 mm.) ..... 15. *pseudominor*, new species
Southwest Tanganyika

b. Males

1. Wings strongly and evenly infuscated. 2
   Wings not, or only slightly, infuscated. 5
2. Tarsi III without white pattern; flagellum without distinct sigilla; area centralis clearly defined, its apical part prominent above surface of propodeum. (Seventh tergite with anal mark; length 18-23 mm.) 3
   Tarsi III with white pattern; flagellum with distinct sigilla; area centralis usually indistinctly defined or subobsolete, its apical part never prominent above surface of propodeum. 4
3. Head orange. ..... 2a. *crococephalus crococephalus* (Tosquinet)
South Africa
   Head blood-red. ..... 2b. *crococephalus rubricaput* (Morley)
Tanganyika to Rhodesia and Angola
4. Seventh tergite with anal mark. (Area centralis fairly distinctly limited.) .....
..... 3. *faustus* (Tosquinet)
Togo and Sierra Leone to Nyasaland, southwest Tanganyika, and Kenya
   Seventh tergite without white anal mark. (Area centralis indistinctly limited or obsolete.) ..... 4. *bucephalus* Morley
East Africa from northern Cape Province to Tanganyika
5. Basic color of entire body, including legs, black, with some white, but without red or ferruginous pattern. (Face and clypeus white; seventh tergite with white anal mark; length 17 mm.) ..... 11. *citriconiger*, new species
Eastern Tanganyika: Uluguru Mts.
   At least the thorax extensively red or ferruginous. (Anterior tergites usually with white apical margins.) 6
6. At least the legs and usually at least tergites 1-2 of the abdomen predominantly ferruginous. 7
   Legs and tergite 2 predominantly black. 8
7. Head dorsally ferruginous; areae dentiparae extraordinarily coarsely reticulate-rugose, the rugae highly elevated; area centralis and areae superoexternae extremely coarsely irregularly transversely rugose; only tergites 1-2 ferruginous, with white apical margins. (Length 18-19 mm.) .....
..... 6. *cariniscrobes* (Morley)
Zululand, Nyasaland, north Tanganyika
   Head dorsally black; areae dentiparae coarsely rugose-punctate as usually, but not extraordinarily highly reticulate-rugose, area superomedia finely and irregularly rugose, nearly smooth; basic color of abdomen varying from predominatly ferruginous to predominantly black. (Length 17 to 18 mm.) ..... 9. *madagascariensis* (Heinrich)
Madagascar
8. Basic color of cheeks ferruginous; sculpture of third tergite rather weak, particularly its second half only sparsely and finely punctured; coxae I and II predominantly white; seventh tergite only with white anal mark. (Length 13-17 mm.) ..... 7. *xanthocephalus* (Brullé)
Cape Province
   Basic color of cheeks black; sculpture of third tergite dense and coarse, rugose-punctate; coxae I and II predominantly black; also the sixth tergite medioapically white. (Length 13 mm.) ..... 14. *minor*, new species
Southwest Tanganyika

1. *Leptophatnus nigrocyaneus* (Tosquinet), new combination

Catadelphus nigrocyaneus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, p. 103, ♀.

Types

Holotype.—♀, "Scioa, Sciotalit, Ragazzi, VII.87." M.C.H.N.

Preamble

Very closely related to the South and Central African *crococephalus* Tosquinet. Differs by ferruginous legs, lack of white anal mark, extensively black head, and, in direct comparison of specimens, by comparatively longer tibiae and tarsi and slightly slenderer femora. Mainly last mentioned difference has led me not to associate the two forms as subspecies, although I believe that they replace each other geographically.

Female

Black, abdomen with bluish tint; seventh tergite faintly ferruginous; wings uniformly and deeply bluish-black infuscated; legs uniformly ferruginous, coxae and trochanters black; head black, the clypeus and orbits broadly red; flagellum black with white annulus; length 23 mm.

Flagellum.—Structure as described for genus; with 53 segments, the widest about 2.5 times as wide as long. Black, with dorsal white annulus on segments 12 (apex) to 15.

2. *Leptophatnus crococephalus* (Tosquinet), new combination

Fig. 16

Distribution

The two subspecies are recorded from Cape Province (type locality) in the south to Tanganyika and Uganda in the north, and Angola in the west.

Preamble

A widely distributed species and one of the largest and most strikingly colored of the Ethiopian region. I do not see any possibility of not associating *crococephalus* Tosquinet and *rubricaput* Morley as subspecies, as they evidently replace each other geographically, agree in structure, and differ only in the shade of the red color of the head.

The species is clearly distinguished structurally by the not swollen, but strongly narrowed temples, by a slight, longitudinal, median impression on frons below lower ocellus in females, by the strongly raised scutellum, the strongly narrowed and prominent apical part of area centralis and by the more or less strongly sinuate costulae. Likewise unmistakable is the color, combining a red head with black body, legs, and wings and with one white anal mark. Flagella of males without distinct sigilla.

Female

Black, abdomen usually with a slight bluish tint; white anal mark on seventh tergite; head red, varying geographically from light orange to dark blood-red; pronotum in populations from tropical Africa more or less extensively red; wings uniformly and deeply infuscated with strong, blue reflection; flagellum black, with white annulus; length 18-23 mm.

Flagellum.—Structure as described for genus; with 47—55 segments, the first nearly 4 times as long as wide, the widest nearly 3 times as wide as long. Black, with dorsal white annulus on segments 9 or 10, rarely 11 to usually 15 or 16, sometimes even 17 or 18; scape red.

Head.—General structure as described for genus; temples steeply declivous from the very border of eyes; cheeks in lateral view moderately wide and scarcely swollen; carinae occipitalis and genalis fairly prominent; face fairly strongly and densely, clypeus scarcely punctured; frons impunctate, with shallow, longitudinal impression below lower ocellus. Red.

Thorax.—Anterior fourth of notauli distinct; median lobe of mesoscutum and anterior part of lateral lobes strongly and fairly densely punctured; scutellum strongly raised above postscutellum, strongly narrowed toward apex, with steep and deep apical slope, dorsally slightly convex, with scattered coarse punctures; central area (fig. 16) with costulae behind middle, approximately parallel-sided before costulae, strongly narrowed backward from costulae into a bottleneck-shaped part which is strongly elevated above surface of propodeum. as are also the entire carinae dentiparae interiores; costulae curved toward apex of propodeum; propodeum and pleura, except central area and speculum, very coarsely and densely rugose-punctate. Black; pronotum, in tropical populations, medially more or less extensively, sometimes predominantly red.

Legs.—Femora III long and rather slender, strongly and rather densely punctured. Black; apex of femora I and the tibiae I ivory on anterior side.

Wings.—Uniformly, deeply infuscated, with blue reflection.

Abdomen.—Postpetiole laterally and apically with scattered punctures; medio-basally usually indistinctly longitudinally striate; gastrocoeli moderately deep; second tergite and the third, except apically, very densely and strongly punctured, subopaque. Black with dark blue tinge; seventh tergite with white anal mark, usually also sixth tergite medio-apically with a narrow white band.

Male

Frons medially, in contrast to female, concave, without the shallow, longitudinal, median furrow; otherwise like female.

Flagellum.—With small, short-oval tyloids on segments 13 or 14 to 20 or 21; segments beyond base ventro-basally concave, but without sigilla. Black with complete white annulus on segments 20-29.

2a. *Leptophatnus crococephalus crococephalus* (Tosquinet)

Platylabus crococephalus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, pp. 114-115, ♀.
Leptophatnus ruficeps Çameron, 1906, Ann. South Afr. Mus., V, pp. 165-166, ♀; new synonymy.
Leptophatnus ruficeps Morley, 1917, Ann. South. Afr. Mus., XVII, pp. 193-194. ♂.
Cratojoppa africana Heinrich, 1930, Mitt. Zool. Mus. Berlin. XV, p. 554, ♀; new synonymy.

Types

Holotypes.—*Platylabus crococephalus* Tosquinet, ♀, "Capland, Krebs". No. 9112. Z.M.H.U.; *Leptophatnus ruficeps* Cameron, ♀, with identification label and type label by Cameron.

S.A.M.; *Cratojoppa africana* Heinrich, ♀, "Capland, Krebs". No. 9112. Z.M.H.U.

Allotype.—*Leptophatnus ruficeps* Morley, 1917, ♂, labeled "androtype". S.A.M.

Distribution

Cape Province, roughly the region of Grahamstown (type locality; see introduction, section on type localities), and Port St. Johns; Natal: region of Pietermaritzburg (C.G.H. II.); Zululand: Mfongosi (Morley 1917).

Female

Head orange; rest of body including pronotum and legs uniformly black; abdomen with dark bluish tinge, seventh tergite with white anal mark, sometimes also sixth tergite medio-apically with narrow white band; wings very strongly and evenly infuscated with metallic-blue reflection; flagellum black with white annulus, scape ventrally orange-red, dorsally black; apex of femora I and he tibiae I anteriorly white; length 18-21 mm.

Male

Agrees completely with female in color; flagellar annulus (neallotype) on segments 20-26, tyloids on segments 14-21.

2b. *Leptophatnus crococephalus rubricaput* (Morley), new combination

Catadelphus rubricaput Morley, 1919, Proc. Zool. Soc. London, p. 123, ♀.

Types

Holotype.—♀, "Msoze in Uganda, Febr. 1903, leg. Delmé-Radcliffe". No. 3b-126. B.M.

Distribution

Uganda (type locality); Tanganyika: Mt. Meru 2700 m, Uluguru Mts. 1700 m, Mbeya 2000 m (C.G.H. II.); Northern Rhodesia: Abercorn (C.G.H. II); northeast Angola: distr. Lunda (C.G.H. II.); Southern Rhodesia: Cachet (N.M.B.).

Female

Head entirely, pronotum more or less extensively blood-red; rest of body and legs uniformly black; abdomen with dark bluish tinge, seventh tergite with white anal mark, usually also sixth tergite medio-apically with narrow white band; wings very strongly and evenly infuscated, with metallic-blue reflection; flagellum black with white annulus, scape entirely blood-red; apex of femora I and the tibiae I anteriorly white.

Male

Agrees completely with female in color; flagellar annulus on segments 20-29, tyloids on segments 13-20.

3. *Leptophatnus faustus* (Tosquinet), new combination

Platylabus faustus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, pp. 112-114, ♂.

Lagenesta sinifer Morley, 1919, Proc. Zool. Soc. London, p. 145, ♀ (nec ♂ ?); new synonymy.

Apatetor sinifer Heinrich, 1935, Mission Sci. de l'Omo, III, 28, pp. 234-235, ♀; recorded from Kenya, Mt. Elgon.

Types

Holotype.—♂, "Togo, Hinterland, Kling". No. 26388. Z.M.H.U. *Lagenesta sinifer* Morley, ♀, "Nyasaland". No. 3b-129. B.M.

Distribution

Tropical West Africa: Togo (type locality) and Sierra Leone (Z.M.H.U.); Nyasaland (type locality of *Lagenesta sinifer* Morley); southwest Tanganyika: east of Lake Nyasa (C.G.H. II.); Kenya: Mt. Elgon (M.N.H.N.).

Preamble

This and the following „species" are tentatively treated as such. Their real status and relationship still remains problematic. The problem centers around the white anal mark on the seventh tergite, which is present in certain specimens named by Morley and absent in others. By way of abbreviation we shall call the former marked and the latter unmarked. I have seen a couple of marked ♂♂ from tropical West Africa (*Platylabus faustus* Tosquinet), unmarked ♀♀ and ♂♂, doubtless correctly associated from East London in southeastern Africa (*Leptophatnus bucephalus* Morley) and marked females *and* unmarked males both from Nyasaland (*Lagenesta sinifer* Morley). There is also a marked ♀ from the eastern side of Lake Nyasa in Tanganyika, and another one from Kenya. Whether or not the marked ♀♀ and unmarked ♂♂ have been correctly associated by Morley is unknown, but by analogy, the correctness of association must be doubted, as a sexual dichroism of this kind, though not at all unusual in this subfamily, does not occur in any of the other species of this genus so far known in both sexes. Aside from the difference in the white mark, the marked and unmarked populations seem to be almost identical, except that in the latter the limitation of the area centralis tends to be obsolete and the scutellum seems to be a trifle more elevated and apically steeper. Because of this structural similarity I was, until recently, thoroughly convinced that the marked, West African *faustus* and the unmarked East African *bucephalus* should be associated as subspecies. But the occurence of marked females together with unmarked males in Nyasaland and particularly the record of a marked female from the east side of the Rift Valley (= of Lake Nyasa), make the subspecific hypothesis somewhat shaky. Theoretically there are now two possibilities: either we are dealing with 3, instead of two subspecies, *sinifer* Morley representing a third, Central African race with sexually dichromatic white anal pattern, or the unmarked and marked forms represent two distinct though extremely similar species which occur side by side in Central Africa. I have tentatively adopted the latter hypothesis.

The species is rather similar in appearance to *crococephalus* Tosquinet, sharing with it the almost uniformly black color of thorax and abdomen, deeply and evenly infuscated wings and the red head. It differs from *crococephalus* by distinctly swollen temples and by extensively white tarsi III. Additionally females are distinguished by lack of longitudinal frontal furrow and presence of a pronounced scopa on coxae III, males by pronounced, large, very clearly defined sigilla, both on ventral and dorsal side of the flagellum.

Differs from the extremely similar *bucephalus* Morley only by the presence of a white anal mark on the seventh tergite in both sexes, by usually fairly distinctly limited area centralis and by a trifle less elevated scutellum.

Female

Deep black, with white anal mark on seventh tergite; head, pronotum, and base of prosternum blood-red; wings uniformly and deeply infuscated, with strong blue reflection; tarsi III extensively white; flagellum black with white annulus; length 18-20 mm.

Flagellum.—Structure as described for genus; with 47-48 segments, the first fully 2.5 times as long as wide, the widest 2.5 times as wide as long. Black with white annulus on segments 9 or 10 to 18 or 19 (base); scape red, dorso-apically usually somewhat infuscated.

Head.—General structure as described for genus; clypeus basally rather strongly convex; temples distinctly swollen, outline of temple profile strongly curved and scarcely narrowed behind eyes; frons moderately concave, without longitudinal median furrow, ocellar triangle with short median longitudinal impression, surrounded by a distinct furrow, except posteriorly; face and clypeus fairly densely and strongly punctured. Uniformly red.

Thorax.—Anterior fourth of notauli distinct; mesoscutum sparsely and finely punctured; scutellum moderately raised above postscutellum, dorsally convex, smoother, laterally less highly carinate and apically more rounded than in *crococephalus* Tosquinet; area centralis normally distinct; propodeum and pleura, except speculum, coarsely and densely rugose-punctate. Black; pronotum predominantly, prosternum basally and sometimes median lobe of mesoscutum partially red.

Legs.—Femora III rather stout, in lateral view not quite 4 times longer than medially wide; coxae III with large, dense scopa. Black: segments 2-5 of tarsi III white; apex of femora I and II and the tibiae I and II ivory on anterior side.

Wings.—Uniformly and deeply infuscated, with blue reflection.

Abdomen.—Postpetiole fairly smooth, with scattered punctures, medially with some irregular, fine rugosity; gastrocoeli moderately deep; second and third tergites densely and strongly punctured. Black; tergite 7 with large white anal mark.

Male

As female; black; head and prothorax red; segments 3—4 of tarsi III and anal mark on seventh tergite white; wings uniformly and deeply infuscated; flagellum black with white annulus; length 20 mm.

Flagellum.—With 45-47 segments; short, longish-oval tyloids beyond middle of segments 10 or 11 to 23; large, pronounced sigilla on dorsal side of flagellum and on ventral side as well, the row beginning on dorsal side on about the 11th segment and continuing to about apex of flagellum, on ventral side beginning on second segment and reaching to about the 28th or 29th. Black, with white annulus on segments 17 (apex) to 25 (in type specimen).

4. *Leptophatnus bucephalus* Morley

Leptophatnus bucephalus Morley, 1917, Ann. South Afr. Mus., XVII, p. 194, ♂.
? Lagenesta sinifer Morley, 1919, Proc. Zool. Soc. London, p. 145, ♂ (nec ♀).

Types

Holotype.—♂, "South Africa, East London, Lightfoot, 1915." S.A.M.
Neallotype.—♀, "South Africa, East London, 27.VII.1961." C.G.H. II.

Distribution

East Africa, from eastern Cape Province: East London (type locality) north to eastern Tanganyika: Uluguru Mts. (C.G.H. II.) and Bukoba (Z.M.H.U.); Uganda: east of Busoga (Morley 1919).

Preamble

About the problem of the status of this form and about its difference from *faustus* Tosquinet, see preamble to the latter species.

Female

Black; abdomen without anal mark, last two tergites with narrowly whitish apical margins; head, pronotum, and base of prosternum restrictedly, usually also base of median lobe of mesoscutum red; segments 2-5 of tarsi III white; wings uniformly and deeply infuscated; flagellum black with full white annulus; length 18-22 mm.

Male

Black, including apical margins of apical tergites, pronotum, entire mesoscutum, and prosternum; otherwise like female.

5. *Leptophatnus alluaudi* (Heinrich), new combination

Apatetor alluaudi Heinrich, 1936, Miss. Scient. de l'Omo, III, 28, p. 234, ♀.

Types

Holotype.—♀, "Mt. Kenya vers Ouest, Forêts inférieures (Podocarpus), 2400 m, Janv. Févr. 1912. (Alluaud et Jeannel)". M.N.H.N.

Distribution

High mountain forests of Kenya: Mt. Kenya, 2400 m (type locality) and northern Tanganyika: Mt. Meru, 2750 m.

Preamble

The only known species of this genus combining almost uniformly ferruginous color of the entire body with even infuscation of wings.

Female

Almost uniformly dark ferruginous; white are only: anal mark on seventh tergite, tarsi III from middle of second to nearly apex of fifth segment, and apical margin of trochanters I; wings evenly and moderately strongly infuscated; flagellum predominantly ferruginous with full white annulus; length 18-19 mm.

Flagellum.—Structure as described for genus; with 49-50 segments, the first about 2.5 times as long as wide and nearly as long as the second, the widest 2.5 times as wide as long. Ferruginous, with full white annulus on segments 10-20, segments 1-9 and scape ferruginous, apex beyond annulus dorsally blackish.

Head.—Structure as described for genus; temples slightly swollen, their outline strongly curved; cheeks in lateral view fairly wide and distinctly swollen; clypeus basally only slightly convex; ocellar triangle surrounded by furrow, except posteriorly; face and clypeus fairly strongly and sparsely punctured. Uniformly dark ferruginous.

Thorax.—Structure as described for genus; basal fourth of notauli pronounced; mesoscutum finely coriaceous with some scattered, rather fine punctures; scutellum moderately raised above postscutellum, dorsally convex and finely coriaceous, with scattered, distinct punctures; central area angularly widened at costulae, slightly narrowed toward base, finely and irregularly rugose; rest of propodeum and mesopleura, except speculum strongly and densely rugose-punctate. Uniformly dark ferruginous.

Legs.—Fairly stout, femora III thick, in lateral view about 5 times longer than medially wide; coxae III with large and dense scopa. Dark ferruginous; ivory are: apical margin of trochanters I, apex of femora I and the tibiae I on anterior side, and tarsi III from about middle of second segment to nearly apex.

Wings.—Uniformly and moderately strongly infuscated.

Abdomen.—Postpetiole laterally fairly strongly and densely punctured, medially nearly smooth, with a few punctures and some irregular, fine rugosity; second and third tergites densely and strongly punctured. Dark ferruginous, seventh tergite with white anal mark.

6. *Leptophatnus cariniscrobes* (Morley), new combination

Fig. 14

Eupalamus cariniscrobes Morley, 1917, Ann. South Afr. Mus., XVII, p. 199, ♀♂.
Lagenesta duplicator Morley, 1919, Proc. Zool. Soc. London, p. 146, ♀, new synonymy.

Types

Holotypes.—*Eupalamus cariniscrobes* Morley, ♀, "Mfongosi, Zululand, W. E. Jones, April-May 1916". S.A.M.; *Lagenesta duplicator* Morley, ♀, "Nyasaland, Mlanje, 2300 ft., 21.X.13, S. A. Neave". No. 3b-130. B.M.

Allotype.—*Eupalamus cariniscrobes* Morley, ♂, labeled "androtype". S.A.M.

Distribution

Zululand: Mfongosi (type locality); Nyasaland: Mlanje, 750 m (B.M.); northern Tanganyika: Mt. Meru, 2700 m (C.G.H. II.); southern Tanganyika: Mbeya (C.G.H. II.).

Preamble

In the group of clear-winged species which follows, this is one of the largest and most conspicuous. Females are distinguished by uniformly ferruginous color of thorax and anterior tergites, combined with black color of the rest of abdomen, except for two large white anal marks, fur-

thermore by extraordinarily coarse reticulate-rugose sculpture of areae dentiparae (fig. 14). Color of males corresponding generally, but anterior tergites apically white margined and apex of tarsi III white. The prominent carina on the median part of interior orbits mentioned by Morley as significant and stressed by the name, is found in all species of the group.

Female

Head, thorax, and legs almost uniformly ferruginous, except large approximately triangular white marks on frontal orbits, and somewhat infuscated tarsi III; tergites 1-2 also uniformly ferruginous, 3-7 black, the seventh with large white anal mark, the sixth with broad white anal band; usually also the extreme margin of fifth tergite medially whitish; flagellum black with white annulus; length 18-20 mm.

Flagellum.—Structure as described for genus; with 46-48 segments, the first 3 times as long as wide, the widest 3 times as wide as long. Black, with almost complete white annulus on segments 9 (apex) to 17 or 18; scape ferruginous except dorsally.

Head.—Structure as described for genus; face and clypeus fairly strongly, but moderately densely punctured; ocellar triangle with longitudinal median furrow, and also surrounding furrow sharply impressed, except posteriorly. Ferruginous; frontal orbits white, strongly widened below ocelli, forming large, approximately triangular marks; ocellar triangle sometimes infuscated.

Thorax.—Structure as described for genus; anterior fifth of notauli distinct; mesoscutum finely and fairly sparsely punctured; scutellum only slightly raised above postscutellum, dorsally nearly flat; propodeum (fig. 14) extraordinarily coarsely sculptured, particularly areae dentiparae extremely coarsely reticulate-rugose; central area sometimes indistinct by irregular, rugose sculpture on anterior half of horizontal part. Uniformly ferruginous.

Legs.—Moderately stout; coxae III with very distinct and dense, but not very large scopa. Uniformly ferruginous, only tarsi III slightly infuscated and apex of femora I and the tibiae I anteriorly yellowish.

Wings.—Clear; areolet not quite closed in front.

Abdomen.—Postpetiole laterally with scattered punctures, medially finely irregularly rugose or indistinctly and weakly, longitudinally striate; second tergite strongly and rather densely, the third somewhat finer punctured. Ferruginous; tergites 3-7 black, the seventh with large white anal mark. the sixth with broad white apical band, sometimes apical margin of fifth tergite medially narrowly whitish.

Male

Head extensively white, with ferruginous and some black pattern; thorax nearly uniformly ferruginous, with very restricted white pattern; tergites 1-2 ferruginous, 3-7 black, the first to third, or second and third only, with narrow white apical bands, sixth with large white anal band, seventh with large white anal mark; legs nearly uniformly ferruginous, tarsi III apically, legs I ventrally white; flagellum black with white annulus; length 18-19 mm.

Flagellum.—With 47-48 segments; narrow, elongate-oval tyloids on segments 9-24; distinct sigilla on ventral and on dorsal side. Black, with complete white annulus on segments 18-25; scape ventrally white.

Head.—Ferruginous; antennal cavity, middle of frons broadly and ocellar region black; the following yellowish-white: clypeus, face, frontal orbits (widened on upper frons into large, approximately triangular marks), outer orbits extensively; mandibles not white-marked.

Thorax.—Ferruginous; the following white: sometimes collare partially and indistinctly, sometimes apex of pronotal ridge narrowly, usually subalarum, apical margin of scutellum, and postscutellum.

Legs.—Ferruginous; segment 3 (from base or apex) to 5 of tarsi III, ventral side of femora I and trochanters I, dot on apex of coxae I, and the tibiae I on anterior side yellowish-white.

Abdomen.—Tergites 1-2 ferruginous, 3-7 black; the anterior three tergites, or more often only the second and third, with narrow white apical bands; sixth tergite with broad white apical band, the seventh with large white anal mark.

7. *Leptophatnus xanthocephalus* (Brullé), new combination

Fig. 12, 15

Joppa xanthocephala Brullé, 1846, in Lepeletier, Hist. Nat. Ins. Hym., IV, p. 280, ♀.
Ichneumon laevifrons Holmgren, 1868, Konigl. Svenska Fregat. Eugenies, Zoologi, VI, p. 392, ♀♂; new synonymy.
Ichneumon macrocephalus Tosquinet, 1896, Mém. Soc. Ent. Belg., pp. 43-45, ♂.
Pseudocillimus laevifrons Roman, 1910, Ent. Tidskr., XXXI, p. 152, ♀♂. (Attributed to genus *Pseudocillimus* Roman; *Ichneumon macrocephalus* Tosquinet as synonym.)

Types

Holotypes.—*Joppa xanthocephala* Brullé, ♀, "Afrique, Delalande". M.N.H.N. (antennae lacking.); *Ichneumon macrocephalus* Tosquinet, ♂, "Capland, Krebs". No. 9639. Z.M.H.U. (antennae lacking).

Lectotype.—*Ichneumon laevifrons* Holmgren, ♀, "Cap B. Spei, Victorin". N.R.; designated by Heinrich 1963.

Paratypes.—4♂♂ of *Ichneumon laevifrons* Holmgren. N.R.

Distribution

South Africa, from Cape Town (type locality) to eastern Cape Province, region of Grahamstown (Tosquinet 1896). Were common, about the end of March, in the Stellenbosch botanical garden, near Cape Town.

Preamble

Related in structure and color pattern to *cariniscrobes* Morley, but smaller, the basic color of thorax, coxae III, and of tergites 1 and 2 never uniformly ferruginous. Thorax, at least ventrally, black, often more extensively; coxae III and anterior tergites usually entirely black, the first and sometimes the second tergite in both sexes with narrow white apical bands; only the seventh tergite with white anal mark, never the sixth; base of mandibles white; tarsi III in both sexes with white pattern. Chromatically rather variable, particularly the black pattern on thorax varying individually.

Female

Head and thorax ferruginous with restricted white pattern; sterna entirely, mesopleura extensively black, sometimes also propodeum and scutellum blackish-infuscated; abdomen black, with white anal mark on seventh tergite; the first and often also the second tergite (never the third) with narrow white apical bands, their basic color sometimes obscure reddish, usually black; legs predominantly black or blackish-brown, coxae III black, coxae I and II and all trochanters partially white; tarsi III and flagellum black, the latter with white annulus; length 17 mm.

Flagellum.—With 46 segments, the first fully 3 times as long as wide, the widest fully twice as wide as long. Black, with nearly complete white annulus on segments 10 (apex) to 16; scape ferruginous, dorso-apically infuscated.

Head.—Structure as described for the genus; ocellar triangle with median longitudinal impression; basal convexity of clypeus rather distinct, face and base of clypeus distinctly and fairly densely punctured. Ferruginous with some white pattern; in contrast to *cariniscrobes*, mandible base always white; white are usually also: marks on corners of clypeus, band on facial orbits, marks on upper end of median field of face, and the frontal orbits, moderately widened on upper part of frons.

Thorax.—Structure as described for genus; anterior fourth of notauli distinct, mesoscutum very finely coriaceous, with few, scattered, fine punctures; scutellum only slightly raised above postscutellum, dorsally convex; sculpture of propodeum, particularly of its apical part, not so extremely coarse as in *cariniscrobes*. Ferruginous, with white subalarum, apical margin of scutellum and postscutellum; the following black: prosternum and mesosternum entirely, mesopleura except upper part, tegulae, sometimes (in holotype) also scutellum, and the propodeum extensively.

Legs.—Moderately stout; coxae III with large, dense scopa. Coxae III, apex of tibiae III, and base of tarsi III black; the following white: segments 3 (except base), 4 and 5 (except apex) of tarsi III, coxae I and II and all trochanters extensively, anterior side of femora and tibiae I and II; rest blackish-brown.

Abdomen.—Postpetiole basally and laterally strongly and sparsely punctured, medially finely irregularly rugose; second and third tergites strongly and densely punctured. Black; tergites 1 and 2 sometimes obscure reddish, the first and sometimes the second with complete or medially broadly interrupted narrow white apical band; seventh tergite with large white anal mark.

Male

Head ferruginous with white face and clypeus and other white markings; thorax ferruginous, sterna and mesopleura always predominantly black, often also propodeum partially to entirely black, and mesoscutum and scutellum more or less extensively infuscated; abdomen black with white anal mark on seventh tergite, the first tergite and usually also the second with narrow white apical band, the one on the second tergite often medially broadly interrupted; legs as in female; flagellum black, with, or without, white annulus; length 13-17 mm.

Flagellum.—With 45-46 segments; lanceolate tyloids on segments 9 or 10 to 19 or 20; distinct sigilla on ventral and dorsal side (fig. 12). Black, usually without, sometimes with white annulus on segments 20 to 24 or 25; scape ventrally more or less extensively ferruginous, with or without white mark.

Head.—Ferruginous, without black pattern; the following white: base of mandibles, face and clypeus, frontal orbits more or less broadly, lower part of outer orbits more or less extensively.

Thorax.—Ferruginous; the following white: collare partially, subalarum, apex of scutellum, postscutellum, rarely apex of pronotal ridge, a more or less extensive mark on mesosternum in the area of sternauli; basic color of sterna and mesopleura always black, except upper posterior part of the latter; sometimes pronotum and propodeum partially to predominantly black, surface of scutellum usually.

Legs.—As in female, but coxae I and II usually almost entirely white, coxae III ventrally often with white band from base toward middle.

Abdomen.—Black with white anal mark on seventh tergite and narrow white apical bands on first and usually on second tergite, the latter often interrupted and restricted to two narrow latero-apical lines.

8. *Leptophatnus triplicator* (Morley), new combination

Lagenesta triplicator Morley, 1919, Proc. Zool. Soc. London, p. 146, ♀♂.

Types

Holotype.—♀, "Nyasaland, Mlanje, Febr. 20. 1913, S. A. Neave". No. 3b-130. B.M.

Distribution

Nyasaland.

Preamble

This species is related to *cariniscrobes* Morley, and still more closely to *madagascariensis* Heinrich and *angolator*, new species, described below. They all form a color group with almost uniformly ferruginous thorax and with (except sometimes *madagascariensis*) basic color of two to all tergites uniformly ferruginous.

The female differs from *cariniscrobes* by less widened flagellum, ferruginous color of at least tergites 1-4, white anal pattern including the fifth tergite, and stouter femora III.

Female

Head, thorax, and legs almost uniformly ferruginous, except broadly white frontal orbits and white subalarum and postscutellum; abdomen predominantly ferruginous, tergites 5-7 with white anal pattern and usually partially infuscated; flagellum black with white annulus; length 16 to 18 mm.

Flagellum.—With 47 segments, the first 3 times as long as wide, the widest twice as wide as long. Black, with complete white annulus on segments 9 (apex) or 10 to 18; segments before annulus ventrally and dorsoapically and the scape ferruginous.

Head.—Structure as described for genus; ocellar triangle with median impression and surrounding furrow. Ferruginous, frontal orbits white, widened on upper part of frons, but not so strongly and triangularly as in *cariniscrobes.*

Thorax.—Structure as described for genus; anterior fifth of notauli distinct; mesoscutum finely coriaceous, finely and moderately sparsely punctured; scutellum only slightly raised above postscutellum, dorsally convex and polished, with few, scattered punctures; propodeum less coarsely sculptured than in *cariniscrobes.* Ferruginous; white are only: collare partially, subalarum and postscutellum.

Legs.—Femora distinctly stouter and shorter than in *cariniscrobes,* femora III about 5 times longer than medially wide; coxae III with dense scopa of median size. Ferruginous, tarsi III moderately infuscated.

Wings.—Clear; areolet quadrangular, close to petiolate.

Abdomen.—Structure as described for genus. Ferruginous, tergites 6 and 7 with large white anal marks, the fifth with more or less extensive medio-apical white band; tergites 5-6 usually more or less extensively blackish-infuscated before white pattern.

9. *Leptophatnus madagascariensis* (Heinrich), new combination

Apatetor triplicator madagascariensis Heinrich, 1938, Mém. Acad. Malgache, XXV, pp. 63-64, ♀♂, and var. 1.

Types

Holotype.—♀, "Madagascar, Perinet, 1932, leg. A. Seyrig". Abdomen partially destroyed by dermestids. C.G.H. I.

Allotype.—♂. "Madagascar, Rogez, 600 m, I.-II. 1931, leg. A. Seyrig". C.G.H. II.

Distribution

Madagascar: Fianarantsoa, Rogez, Perinet, Ampandrandava, Montagne d'Ambre.

Preamble

When I associated this species with *triplicator* Morley in 1938 as a subspecies, I did not yet know the several similar and closely related species inhabiting the African continent. Today 4 species are known to me every one of which could theoretically, with almost equal good reason, be considered as subspecifically associated with *madagascariensis* Heinrich. Under these circumstances, I prefer to treat this form as a full species, particularly as the extensively white and black color of the head of females distinguishes the madagascan form uniquely from all others. Among the species from the African continent *duplicator* Morley (as interpreted in this paper) seems to be the most similar and closely related. It differs by lack of black and white color (except on frontal orbits) on the head, by white subalarum, distinctly swollen lower part of cheeks, much more densely punctured lower half of mesopleura and lack of transverse striation on median part of mesopleura.

Female

Head white with extensive black pattern; thorax uniformly ferruginous, always including subalarum, except sometimes apical margin of scutellum and the postscutellum; abdomen ferruginous, tergites 1-2 or 1-3 usually with narrow white apical bands, the sixth with broad white, medially emarginate, apical band, the seventh with large white anal mark; basic color of last 3 tergites more or less extensively infuscated; in variants (geographical?) basic color of entire abdomen black; flagellum black with white annulus; length 16-19 mm.

Flagellum.—With 44-45 segments, the first not quite 3 times as long as wide, the widest less than 2.5 times as wide as long. Black, with complete white annulus on segments 9-13 (type), sometimes from 8 (apex) to 21.

Head.—Structure as described for genus; temples distinctly swollen, with curved outline; lower part of cheeks in lateral view moderately wide, scarcely swollen; clypeus basally scarcely convex; ocellar triangle with slight median impression and distinct surrounding furrow; face and clypeus distinctly and moderately sparsely punctured. White; the following black: antennal cavity, middle of frons fairly narrowly, ocellar region, occipital and temple regions (the black of the latter extending broadly to the margin of eyes), hind part of cheeks along carina genalis to base of mandibles, apex of cheeks at base of mandibles, malar space; in holotype, median field of face and middle of clypeus faintly ferruginous-tinged.

Thorax.—Structure as described for genus; basal fifth of notauli distinct; mesoscutum very finely and densely coriaceous, with a very few, scattered fine punctures; scutellum apically scarcely raised above postscutellum, dorsally slightly convex; propodeum coarsely rugose-punctate, with complete carination; mesopleura on inferior half strongly but not very densely punctured, intervals between punctures about as wide as punctures, below speculum with long, slightly curved transverse striae. Ferruginous, including subalarum; apical margin of scutellum and postscutellum sometimes white.

Legs.—Fairly stout; coxae III with moderately large scopa. Ferruginous; tarsi III and II infuscated; tibiae I and II ivory on anterior side; in melanistic mutants sometimes tibiae dorsally and tips of femora infuscated.

Wings.—Clear; areolet quadrangular.

Abdomen.—Structure as described for genus; postpetiole basally and laterally sparsely punctate, medially very finely, irregularly rugose; second and third tergites densely and strongly punctured. Ferruginous, basic color of tergites 5-7 usually more or less extensively blackish-infuscated; in melanistic (geographical?) varieties, basic color of abdomen sometimes entirely black or blackish; tergites 1-2 or 3 usually with narrow white apical bands, the sixth with broad medio-apical band which is usually medially emarginate, the seventh tergite with large anal mark.

Male

Segments 2 (apex) to 5 of tarsi III white; sterna and coxae and trochanters I and II white or whitish; tergites more melanistic than in female, the basic color of posterior tergites usually entirely black; white apical margins on anterior tergites more pronounced, on sixth tergite more reduced than in female; otherwise like female; length 17-18 mm.

Flagellum.—With longish-oval tyloids on segments 10-20; narrow, unobtrusive sigilla on ventral side, no distinct sigilla on dorsal side of flagellum. Black, with complete annulus on segments 18-30 or 32.

10. *Leptophatnus angolator*, new species

Types

Holotype.—♀, "Angola, 30 km N. of Quiculungo, Sept./Oct. 1954." C.G.H. II.

Paratypes.—2♀♀, same locality and date. C.G.H. II.

Distribution

Northwestern Angola.

Preamble

Similar to *duplicator* Morley, but tarsi III partially white, clypeus, face, and cheeks with white pattern and coxae I and II white; white anal pattern, however, more restricted than in *duplicator*.

Female

Head, thorax, legs, and abdomen ferruginous-red; head with rich, thorax with very restricted white pattern; seventh tergite with large white anal mark, the first and sixth with narrow white apical bands; tergites 3-6 apically infuscated; coxae I and II and all trochanters white; tarsi III basally infuscated, apically white; flagellum black, with white annulus; length 16-17 mm.

Flagellum.—With 44-45 segments, the first scarcely 3 times as long as wide, the widest scarcely twice as wide as long. Black, with white dorsal annulus on segments 10—18; segments before annulus narrowly brownish at apex; scape ferruginous.

Head.—Structure as described for genus; face and clypeus moderately sparsely and finely punctured; ocellar triangle with median impression and surrounding furrow. Ferruginous-red; the following white: base of mandibles, marks on sides of clypeus, facial orbits more or less extensively, small marks on upper median border of face, frontal orbits (widened on upper part), marks on vertical orbits, large patch, varying in length, on lower part of outer orbits.

Thorax.—Structure as described for genus; anterior fifth of notauli distinct, mesoscutum finely, on median lobe fairly densely punctured; scutellum distinctly raised above postscutellum, dorsally convex. Ferruginous-red; the following white: subalarum, postscutellum, usually apical margin of scutellum.

Legs.—Femora III fairly stout; coxae III with large, dense scopa. Ferruginous-red; tarsi II and III distinctly, very tip of all femora, the apices of tibiae II and III and their extreme base more indistinctly infuscated; segments 3-5 of tarsi III and sometimes apex of second segment white; apices of femora I and II and the tibiae I and II ivory on anterior side.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole basally and laterally sparsely punctured, medially finely, irregularly rugose; second and third tergites not very stron-

gly, but densely punctured. Ferruginous-red; first and sixth tergites with white apical margins, the seventh with large white anal mark; sides of seventh tergite and tergites 3-6 apically infuscated to an extent gradually increasing from tergite to tergite.

11. *Leptophatnus citriconiger*, new species

Types

Holotype.—♀, "Tanganyika, Uluguru Mts., 700 m, 14.I.62." C.G.H. II.
Allotype.—♂, same locality, 30.XII.61. C.G.H. II.
Paratype.—♀, same locality, 7.I.62. C.G.H. II.

Distribution

Eastern Tanganyika: Uluguru Mts., at 700 m.

Preamble

A robust species, with fairly strongly widened flagellum, distinguished by predominantly black color of thorax, abdomen, and legs, combined in females with orange mesoscutum and scutellum, and with white pattern on head, trochanters, and coxae I and II; in males tarsi III with white annulus and thorax uniformly black.

Female

Black; mesoscutum, scutellum, and upper part of pronotum orange; head extensively white-marked; abdomen with white anal pattern on tergites 6 and 7; all trochanters and coxae I and II extensively white; flagellum black with white annulus; length 18-19 mm.

Flagellum.—With 47 segments, the first about 2.5 times as long as wide, the widest 2.5 times as wide as long. Black, with dorsal white annullus on segments 9-19; scape black.

Head.—Structure as described for genus; ocellar triangle with sharp median impression and surrounding furrow; temples and cheeks moderately swollen; clypeus basally only slightly convex. Black; the following white: base of mandibles, sides of clypeus broadly, facial orbits (their white band confluent below with white on sides of clypeus), frontal orbits, patch on lower part of outer orbits; median field of face and middle of clypeus partially red-brown tinged.

Thorax.—Structure as described for genus; anterior fifth of notauli distinct; mesoscutum very finely coriaceous, with sparse, weak punctures; scutellum somewhat raised above postscutellum; central area finely, irregularly rugose, rest of propodeum strongly and densely rugose-punctate. Black: mesoscutum and scutella ligth orange in type specimen, ferruginous and orange in paratype; pronotal ridge and upper part of propleura a shade darker orange-red; area of speculum, or middle of mesopleura more extensively, blood-red, in paratype also middle of metapleura faintly dark-red-tinged: subalarum with white line.

Legs.—Femora III moderately long; coxae III with large, dense scopa. Black; the following white: coxae I and II apically extensively, trochanters I and II ventrally, trochanters III apico-ventrally, anterior side of femora and tibiae I and II.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole basally and laterally fairly strongly punctured, medially very finely, irregularly rugose, nearly smooth; second and third tergites moderately strongly and very densely punctured. Black: sixth tergite with white apical band, the seventh with large white anal mark.

Male

Face and clypeus white, frons without white pattern; basic color of entire thorax, including mesoscutum, black; mesosternum with large white mark; only the seventh tergite with white anal mark; legs as in female, tarsi III, however, with white annulus and white on coxae more extensive; flagellum with white annulus; length 17 mm.

Flagellum.—With 47 segments; small, oval tyloids on segments 9-19; distinct sigilla on ventral and dorsal side. Black, with complete white annulus on segments 20-27; scape ventrally white.

Head.—Black; white are: base of mandibles, clypeus, face (except small black median mark), and patch on lower part of outer orbits.

Thorax.—Black; white are: subalarum, postscutellum partially, large patch on mesosternum.

Legs.—Black; white are: segments 2 (apex) to 5 (except apex) of tarsi III, anterior side of tibiae and femora I and II, all trochanters and trochantelli ventrally, coxae I and II nearly uniformly, coxae III ventrobasally.

12. *Leptophatnus ulugurus*, new species

Types

Holotype.—♀, "Tanganyika, Uluguru Mts., 700 m, 30.XII.61." C.G.H. II.
Paratypes.—5 ♀♀, same locality, 20.-30.XII.61. C.G.H. II.

Distribution

Eastern Tanganyika: Uluguru Mts. (mountain foot); southern Mozambique: Delagoa Bay (Z.M.H.U.).

Preamble

Similar to *citriconiger* Heinrich in appearance and in extensive white on face, anterior coxae, and trochanters, but basic color of entire thorax red, tergites 1-3 with white apical margins, flagellum distinctly less widened, and femora III shorter and stouter.

Female

Head with extensive white pattern, including entire face and clypeus; thorax red, with very restricted white-and-black pattern; abdomen black, varying to brownish-black on anterior tergites, with white anal pattern on tergites 6 and 7 and white apical margins on tergites 1-3; all trochanters and coxae I and II predominantly white; basic color of legs red (or blackish-brown) and black; flagellum black with white annulus; length 15-18 mm.

Flagellum.—With 44-46 segments, the first about 3 times as long as wide, the widest twice as wide as long. Black, with dorsal white annulus on segments 10-18 (base); segments before annulus apically narrowly, sometimes ventrally extensively ferruginous; scape ventrally white.

Head.—Structure as described for genus; ocellar triangle with distinct median impression and surrounding furrow. White; the following red (varying often extensively to black or blackish-brown): antennal cavity, middle of frons broadly, ocellar, occipital, and temporal regions, posterior part of cheeks; the dark, basic color projecting on vertex narrowly, on temples broadly to border of eyes; sutures between face and clypeus, between median field of face and lateral fields, the apex of cheeks at mandible base and the malar space usually indistinctly reddish; mandible base white.

Thorax.—Structure as described for genus; basal fifth of notauli distinct; scutellum distinctly raised above postscutellum; mesoscutum finely coriaceous, sparsely and weakly punctured. Red; the following black: pronotal base, tegulae, mark below subalarum, the latter and the postscutellum white; rarely propodeum partially infuscated.

Legs.—Rather stout; femora III comparatively short and thick; coxae III with large, dense scopa. Legs I and II dorsally black or blackish-brown, femora and tibiae I and II white on anterior side; coxae I and II predominantly, all trochanters ventrally white, trochanters III usually entirely; coxae III ventrally red, dorsally black; femora III red, apically narrowly black, sometimes extensively blackish; tibiae III more or less strongly infuscated, the tarsi III black.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally and basally sparsely punctured, medially finely coriaceous with faint vestiges of irregular rugosity; second and third tergites fairly finely and densely punctured. Black, anterior tergites often partially dull reddish; apical margins of tergites 1-3 white; sixth tergite with white apical band, the seventh with large white anal mark.

13. *Leptophatnus poecilicolor*, new species

Types

Holotype.—♀, "South Africa, Grahamstown, IX.51, R. Gossen leg." C.G.H. II.

Distribution

Eastern Cape Province: Grahamstown.

Preamble

In structure, and in basic color very closely related to *ulugurus* Heinrich. I would have regarded the forms as associated subspecies, but for one very obvious structural difference: in *poecilicolor* the femora III are distinctly longer and less inflated than in *ulugurus*. Chromatically the two species agree in the extensively white head, trochanters, and coxae I and II, in the predominantly red thorax, in the white apical margins on tergites 1-3, and white anal marks on tergites 6 and 7. They differ in the basic color of tergites 1-3 which is light red in *poecilicolor*, black or brownish-black in *ulugurus*, and in the white marks on vertical orbits, present in *ulugurus*, lacking in *poecilicolor*.

Female

Head with extensive white pattern, including face and clypeus, but no white on vertex; thorax red, with very restricted white and black pattern, median lobe of mesoscutum orange-tinged, the lateral lobes slightly infuscated; abdomen black, tergites 1-3 red with white apical margins, the third infuscated toward apex, tergites 6 and 7 with white anal pattern; all trochanters and coxae I and II predominantly white; basic color of legs red; flagellum black with white annulus; length 17 mm.

Flagellum.—With 47 segments, the first about 3 times as long as wide, the widest nearly 2.5 times as wide as long. Black, with dorsal white annulus on segments 10-18 (base); segments before annulus apically narrowly, ventrally extensively ferruginous; scape ferruginous, ventrally white-marked.

Head.—Structure as described for genus; ocellar triangle with distinct median impression and surrounding furrow. White; the following red: antennal cavity, middle of frons broadly, ocellar region, posterior part of cheeks and apex of cheeks at mandible base; vertex, occiput, and temples black; lateral fields of face partially reddish; mandible base white.

Thorax.—Structure as described for genus; basal fifth of notauli distinct; scutellum distinctly raised above postscutellum; mesoscutum finely coriaceous, weakly and moderately sparsely punctured. Red; the following black: pronotal base with lower part of propleura, mark below subalarum, tegulae predominantly, base of area centralis; subalarum, apical margin of scutellum, postscutellum, and a mark on each side of mesosternum, white; mesoscutum and upper part of pronotum orange, the lateral lobes of mesoscutum infuscated.

Legs.—Moderately stout; femora III neither particularly stout nor conspicuously inflated (as in *ulugurus*); coxae III with large, dense scopa. Legs dorsally reddish-brown; femora and tibiae I and II white ventrally and on anterior side; coxae I and II predominantly, all trochanters and trochantelli ventrally white; coxae III ventrally red, dorsally blackish; apices of femora, the tarsi, and apex of tibiae III somewhat infuscated.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally and basally rugose-punctate, medially distinctly, irregularly-longitudinally rugose; second tergite densely and fairly coarsely, the third more finely punctate. Black; tergites 1-3 red with white apical margins, the third infuscated toward apex; sixth tergite with broad apical white band, the seventh almost entirely white.

14. *Leptophatnus minor*, new species

Fig. 17

Types

Holotype.—♀, "S. W. Tanganyika, Mbeya, 17.XII.62." C.G.H. II.
Allotype.—♂, same locality, 16.XII.62. C.G.H. II.

Distribution

Southwest Tanganyika: Mbeya.

Preamble

One of the smallest species of the genus. I have separated it from the next one after very careful examination and am convinced that these are two extremely similar sibling species rather than mutants of the same species. I have, however, only one specimen of each at hand, which is not enough to achieve certainty. Both species are chromatically distinguished by nearly uniformly red head and thorax, combined with black abdomen with anal marks on the last two tergites. In *minor* the white on the head is restricted to a narrow stripe on frontal orbits and on the thorax to the postscutellum and subalarum. In *pseudominor,* new species, the white on head is somewhat more extensive, including also a mark on the lower part of cheeks and on the mandible base, whereas on the thorax only the postscutellum is white, not the subalarum. Other small differences will be mentioned in the description. The only slight structural difference between the two similar species is found in the cheeks. In lateral view, the cheeks of *minor* are somewhat wider (fig. 17) (distance from outer orbits to carina genalis at lower end of eyes) than in *pseudominor;* also in *minor,* in lateral view, the carina genalis diverges a trifle from the outer orbits on lower part of cheeks and then converges apically in a slight curve toward mandible base (fig. 17), while in *pseudominor* it appears to run straight (fig. 18). Sculpture of third tergite coarser and denser in *minor* than in *pseudominor.*

Female

Head red, including mandibles; only frontal orbits narrowly white; thorax red, subalarum and postscutellum white, central area and some other markings black; abdomen black, tergites 6 and 7 extensively white, tergites 1-2 with obscure reddish tinge; coxae II and III black, the legs predominantly black or blackish-brown; flagellum black with white annulus; length 13 mm.

Flagellum.—With 42 segments, the first about 3 times as long as wide, the widest fully twice as wide as long. Black, with dorsal white annulus on segments 10 (apex) to 18; segments before annulus apically narrowly brownish; scape red.

Head.—Structure as described for genus; cheeks distinctly swollen and rather wide; carina genalis slightly curved toward mandible base; face and clypeus distinctly and fairly densely punctured. Red, including mandibles; frontal orbits narrowly yellowish-white; no black marks except mandible teeth.

Thorax.—Structure as described for genus; median lobe of mesoscutum on anterior part with very slight longitudinal impression; anterior fifth of notauli distinct; mesoscutum finely coriaceous, finely and sparsely punctured; scutellum slightly raised above postscutellum. Red; subalarum and postscutellum yellowish-white; the following black: area centralis of propodeum, tegulae, prepectus extensively, apex of mesosternum; two irregular infuscated patches on lower half of mesopleura.

Legs.—Femora moderately stout; coxae III with large, dense scopa. Blackish-brown; coxae II and III, trochanters III, and trochanters II dorsally, black; the following white: a dot on the very apex of coxae I and II,

apical margin of all trochanters, tibiae and femora I on anterior side, tibiae II and apex of femora II on anterior side; coxae I extensively, and trochanters II ventrally, reddish.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally and basally fairly densely punctured, medially very finely rugose; second and third tergites fairly strongly and very densely punctured, subopaque. Black, first tergite obscurely reddish, sixth and seventh tergites predominantly white.

Male

The association of this male with *minor* female is tentative, as it could just as well belong to the following, so very similar species.

More melanistic than female; the following black: sterna, lower part of propleura and mesopleura, entire propodeum, basic color of cheeks, antennal cavity, scape; the following white: base of mandibles, clypeus, face (except black median mark), large mark on lower part of outer orbits, apical margins on tergites 1-3 and 6, anal mark on seventh tergite, scape ventrally, segments 3-5 of tarsi III, apices of coxae I and II, trochanters ventrally, tibiae I and II on anterior side, femora I and II on ventral and on anterior side; length 13 mm.

Flagellum.—With 43 segments; narrow tyloids on segments 10-19; fairly distinct sigilla on ventral and dorsal side. Black, with white annulus on segments 19-23.

15. *Leptophatnus pseudominor*, new species

Fig. 18

Types

Holotype—♀, "S. W. Tanganyika, Mbeya, 18.XII.62." C.G.H. II.

Distribution

Southwest Tanganyika: Mbeya (type locality); Natal (Zoological Institute, Lund University).

Preamble

Extremely similar to *minor* Heinrich. For the main differences, see preamble to the latter species.

Female

Head red; mark on base of mandibles, patch on apical part of outer orbits and the frontal orbits white, antennal cavities black; thorax red, only postscutellum white, not subalarum; abdomen black, first tergite red, tergites 6 and 7 extensively white, the second tergite with very narrowly whitish apical margin; all coxae and femora III predominantly dark red; flagellum black, with white dorsal annulus; length 13.5 mm.

Flagellum.—With 44 segments, the first about 3 times as long as wide, the widest nearly 2.5 times as wide as long. Black, with dorsal white annulus on segments 9 (apex) to 17 (base); scape black, ventrally red at base: segments before annulus apically narrowly brownish.

Head.—Structure as described for genus; temples and cheeks slightly less swollen than in *minor*, the carina genalis running in an almost straight

line to the base of mandibles (fig. 18). Red, with white mark on mandible base and on lower end of outer orbits; frontal orbits white; antennal cavities black.

Thorax.—Structure as described for genus; median lobe of mesoscutum comparatively narrower than in *minor* and without indication of median depression; anterior fifth of notauli distinct, mesoscutum finely coriaceous, with sparse, fine puncturation; scutellum slightly raised above postscutellum. Red; postscutellum white; the following black: tegulae, base of prosternum, prepectus partially, pronotal base partially.

Legs.—Femora moderately stout; coxae III with distinct scopa. Blackbrown; coxae red, their bases and apex of coxae III dorsally infuscated, coxae I and II apically white-marked; the femora III, except apex, dark red; the following white: trochanters ventrally, tibiae I and II and apex of femora II apically on anterior side, and femora I on anterior and ventral sides.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally and basally fairly densely punctured, medially finely coriaceous-rugose; second and third tergites very densely punctured, but not quite as strongly as in *minor*. Black, first segment red, second tergite with very narrowly whitish apical margin which is more distinct laterally than medially; sixth tergite with broad apical white band, the seventh predominantly white.

Remark

One female from Natal (Zoological Institute, Lund University) seems to belong to this species, agreeing with it in structure and general color pattern. It differs by a lighter shade of red, which also includes the entire second and third tergites, and by white-marked subalarum. It may represent a distinct subspecies.

16. *Leptophatnus melanisticus*, new species

Types

Holotype.—♀, "Angola, Cacolo, 1300 m, 23. Dec. 1957 - 27. Jan. 58." C.G.H. II.

Distribution

Northeast Angola: near Cacolo, at 1300 m.

Preamble

This species seems to be related to *pseudominor* Heinrich, but has a still slenderer flagellum and predominantly black thorax.

Female

Head uniformly red with only a short, whitish line on frontal orbits; mesoscutum, scutellum and most of pronotum red, postscutellum white; rest of thorax, the legs and abdomen deep black, sixth tergite with white apical band, seventh with large white anal mark; flagellum black, with white annulus; length 16 mm.

Flagellum.—With 45 segments, the first about 3 times as long as wide, the widest about 1.5 times as wide as long. Black, with dorsal white annu-

lus on segments 9 (apex) to 17; segments before annulus apically narrowly brownish; scape red.

Head.—Structure as described for the genus; temples and cheeks only moderately swollen; face and clypeus distinctly and fairly densely punctured; ocellar triangle with distinct median impression and surrounding furrow. Vivid red; short whitish line on frontal orbits.

Thorax.—Structure as described for genus; basal fifth of notauli distinct; mesoscutum finely coriaceous, finely and sparsely punctured; scutellum slightly raised above postscutellum. Deep black; the following vivid red: pronotum, including collare, except the black apical inferior triangle, mesoscutum, scutellum; postscutellum white.

Legs.—Femora moderately stout; coxae III with distinct, medium-sized, dark scopa. Black, including coxae and trochanters, femora I blackish-brown; the following white: small apical dot on coxae I, narrow apical margins of all trochanters, anterior side of femora I, of apex of femora II, and of tibiae I and II.

Wings.—Clear; areolet quadrangular.

Abdomen.—Base and sides of postpetiole fairly strongly punctured, the middle coriaceous-rugose; second and third tergites strongly and very densely punctured. Deep black; apex of sixth tergite with white band, seventh tergite predominantly white.

17. *Leptophatnus gabunensis*, new species

Types

Holotype.—♀, "Gabun, West Afrika (Staudinger)." Z.M.H.U.

Distribution

Gabon.

Preamble

A robust, fairly large species, in general appearance similar to *citriconiger* Heinrich from East Africa, but differing by extensively white and slightly thicker tarsi III, orange mesopleura and metapleura, only one white anal mark and uniformly black face; distinguished structurally by partially obsolete carina oralis.

Female

Head black, mandible base and large marks on frontal orbits white; thorax predominantly dull orange, with black pronotum, upper surface of propodeum and most of sterna; abdomen black, seventh tergite with large white anal mark, tergites 1 and 2 apico-laterally narrowly white; legs extensively black or blackish-brown, the tarsi III and coxae I and II predominantly white; flagellum black with white annulus; length 18 mm.

Flagellum.—With 48 segments, the first about 3 times as long as wide, the widest about 2.3 times as wide as long. Black, with white dorsal annulus on segments 10 (apex) to 19; segments before annulus apically narrowly brownish; scape black.

Head.—Structure as described for genus; apical part of carina oralis entirely obsolete, it thus does not meet carina genalis near mandible base,

as usually; ocellar triangle with median impression and surrounding furrow; temples and cheeks only slightly swollen; basal convexity of clypeus distinct. Black; clypeus dark red; the following white: large marks on frontal orbits, mandible base broadly, indistinct marks on corners of clypeus.

Thorax.—Structure as described for genus; anterior fifth of notauli distinct; mesoscutum finely coriaceous, sparsely and finely punctured; scutellum slightly raised above postscutellum, gradually sloping down to the latter. Dull orange-yellow; the following black: pronotum, prosternum, prepectus, mesosternum (except yellowish mesolcus and triangular median apical mark), horizontal part of propodeum including areae spiraculiferae, subalarum, and anterior upper part of mesopleura; scutella and lateral slopes of scutellum lighter yellowish.

Legs.—Femora moderately stout; coxae III with distinct scopa. Blackish-brown (perhaps black in fresh specimens); the following yellowish-white: coxae I and II predominantly, coxae III ventro-basally, trochanters I and II ventrally, apical margins of all trochanters, anterior side of femora and tibiae I and II, and segments 1 (apex) to 5 of tarsi III.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally densely, basally sparsely punctured, medially finely coriaceous-rugose, with few punctures; second tergite and about half of the third densely and strongly rugose-punctate; third tergite toward apex more sparsely and finely punctured. Black; seventh tergite with large white anal mark; narrow apical margin of sixth tergite and the first and second tergites latero-apically narrowly white.

18. *Leptophatnus simplex*, new species

Types

Holotype.—♀, "Tanganyika, Uluguru Mts., 700 m, 5.1.1962." C.G.H. II
Paratype.—♀, same locality, 14.I.1962. C.G.H. II.

Distribution

Eastern Tanganyika: Uluguru Mts., at 700 m.

Preamble

A rather typical species of this genus, but distinguished from all the others by weakly and not completely laterally carinate scutellum and by sparser and finer sculpture of anterior tergites; femora very stout.

Female

Head white with black dorsal pattern; median lobe of mesoscutum red, with short white median lines, lateral lobes black; rest of thorax predominantly pale orange, including scutellum, with rich white pattern; abdomen uniformly ferruginous-red, the seventh tergite with white apical margin; legs predominantly feruginous-red, tarsi infuscated; flagellum black with white annulus; length 16 mm.

Flagellum.—With 44 segments, the first about 2.5 times as long as wide, the widest nearly 2.5 times as wide as long. Black, with white dorsal annulus on segments 9 (apex) to 18; scape ventrally red; segments before annulus apically narrowly brownish.

Head.—Structure as described for genus; malar space somewhat shorter than usual, barely as long as one third of width of mandible base; ocellar triangle with median impression and surrounding furrow; face and clypeus weakly and sparsely punctured. White, including mandible base; antennal cavity red; the following black: middle of frons broadly, ocellar, occipital, and temple regions; face and clypeus medially faintly ferruginous.

Thorax.—Structure as described for genus; anterior fifth of notauli distinct; mesoscutum finely coriaceous; with few, scattered, weak punctures; scutellum slightly raised above postscutellum, gradually sloping to the latter, dorsally moderately convex and polished, laterally weakly carinate to beyond middle; lateral carinae of anterior part of central area subobsolete. Median lobe of mesoscutum vivid red, with short, somewhat indistinct white median lines; lateral lobes black; the following white: collare, pronotal ridge and base, subalarum, mark on tegulae, postscutellum, indistinct medially interrupted transverse band on lower half of mesopleura, apex of mesosternum medially, apex of prosternum, prepectus predominantly: rest of thorax orange, including scutellum; black patch below subalarum; lateral areas of horizontal part of propodeum and middle of propleura more or less extensively and distinctly infuscated.

Legs.—Femora very stout; femora III in lateral view only about 4.5 times as long as medially wide; coxae III with distinct scopa of medium size. Ferruginous-red; tarsi III and very tip of femora and tibiae III black; anterior side of tibiae I and II and the coxae I and II extensively whitish; apex of femora I and II dorsally, tarsi I and II, and the dorsal side of tibiae I and II infuscated.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally sparsely punctured, medially finely coriaceous-rugose; second tergite finely and on basal part fairly densely punctured, the third finely coriaceous, very finely and sparsely punctured. Uniformly ferruginous-red, only the seventh tergite with narrowly white apical margin.

19. *Leptophatnus separatus* (Heinrich), new combination

Apatetor separatus Heinrich, 1938, Mém. Acad. Malgache, XXV, pp. 64-65, ♀.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, I.-II.1931, leg. A. Seyrig". C.G.H. I.

Paratype.—♀, same locality and date. C.G.H. II.

Distribution

Madagascar: Rogez.

Preamble

This species is not a typical *Leptophatnus*. It differs from all other species of this genus by coarser sculpture of anterior tergites, deeper gastrocoeli and laterally rounded, basally not convex clypeus. On the other hand, the propodeal and mandibular structure agree well with *Leptophatnus* and the relationship to that genus seems to be closer than to any other.

Female

Head white with black dorsal pattern; thorax tricolored, ventrally white, dorsally with black and white pattern and with blood-red mesoscutum; abdomen tricolored: red, basally and apically black, with extensive white anal pattern and large white latero-apical marks on third tergite, usually also white apical margin on postpetiole; legs predominantly ferruginous-red; flagellum black with white annulus; length 14 mm.

Flagellum.—Apically more strongly attenuated than typical for the genus; with 42 (holotype) to 44 segments, the first fully 3 times as long as wide, about the 15th square, the widest twice as wide as long. Black, with dorsal white annulus on segments 7 (apex) or 8 to 15 or 16; scape black, with whitish ventro-basal mark.

Head.—Clypeus laterally rounded, basally not convex; occiput rather deeply emarginate, structure otherwise as described for this genus; ocellar triangle with distinct median impression and surrounding furrow. White, including mandible base; the following black: antennal cavity, middle of frons narrowly, ocellar, occipital, and temple regions, the black color of the latter extending to the border of eyes.

Thorax.—Pronotal ridge somewhat widened; structure otherwise as described for the genus; anterior fourth of notauli distinct; mesoscutum very finely coriaceous, finely and sparsely punctured; scutellum somewhat raised above postscutellum, dorsally slightly convex and gradually sloping toward postscutellum; areae coxales distinct. Mesoscutum blood-red; the following white: collare, pronotal ridge and base, subalarum, scutellum, about lower half of mesopleura and the sterna, the mesosternum partially indistinctly ferruginous-tinged; the following black: pronotum extensively to predominantly, patch on mesopleura below subalarum, exterior sutures of mesoscutum, lateral slopes of scutella, horizontal part of propodeum, including, or except, the central area; rest ferruginous.

Legs.—Femora III rather short and stout; coxae III with weak scopa. Ferruginous; the tarsi and tibiae dorsally infuscated.

Wings.—Clear; areolet not quite quadrangular.

Abdomen.—Postpetiole fairly coarsely sculptured, laterally rugose-punctate, medially distinctly, longitudinally striate; second and third tergites, the latter except about apical third, coarsely and densely rugose-punctate, space between gastrocoeli with short striation; gastrocoeli rather large and deep, about as wide as the space between. Red; basic color of first and of sixth and seventh, or fifth to seventh tergites, black; sometimes blackish-infuscated patches on second tergite behind gastrocoeli; the following white: the apical margin of first tergite more or less distinctly, large latero-apical marks on third tergite, latero-apical bands on fifth, broad, continuous apical band on sixth. and most of the seventh tergite; base of first tergite red.

10. Genus *Pseudophatnus*, new genus

Fig. 19

Type species.—*Platylabus lucifer* Morley

Distribution

Eastern Africa from northern Tanganyika south to Port Elisabeth.

Preamble

This genus is related to *Leptophatnus* Cameron on one side and to *Apatetorops* Heinrich on the other. The general structure of the propodeum is more similar to the latter than the former genus, as the propodeal surface slopes down gradually in a continuous, gentle curve from postscutellum to apex and toward the sides from the central area. The latter is anteriorly almost contiguous to postscutellum and widest at anterior border, its distinct lateral bordering furrows converging gradually with a straight course to the narrow apex, giving the central area an elongate, wedge-shaped outline (fig. 19). This structure too is similar to *Apatetorops*. In contrast to the latter genus, however, the carinae dentiparae interiores and the costulae are distinct. Other distinctive differences from *Apatetorops* are: the laterally sharply carinate scutellum in both sexes and the very distinct sigilla of flagella in males, both these characters being shared by *Leptophatnus*.

Morphological characters

All structural characters are as described for the genus *Leptophatnus*, except for the specialization of the propodeum described above in the preamble and for a somewhat coarser sculpture of anterior tergites, with more or less distinctly striate middle of postpetiole.

Key to the species of *Pseudophatnus* Heinrich

a. Females

1. Median lobe of mesoscutum, scutellum and upper part of pronotum orange-tinged, to yellowish, the lateral lobes more or less infuscated; dorsal pattern on head, including vertex and temples, black; sides of face and clypeus broadly yellow, their middle light ferruginous. (Length 14 mm.) ..... 1. *lucifer* (Morley)
   Zululand, Cape Province

   Entire mesoscutum, pronotum, and scutellum vivid red; dorsal pattern on head usually entirely or partially vivid red; face and clypeus usually entirely vivid red, except a short yellow line on upper facial orbits (at most). 2
2. Area superomedia, areae dentiparae and spiraculiferae, and declivity of propodeum, black; the second tergite black, with small white latero-apical marks. (Mesosternum black; length 13 mm.) ..... 2. *glabrinotor* (Morley)
   Nyasaland

   Area superomedia at most basally, areae dentiparae not at all, areae spiraculiferae sometimes restrictedly at base, declivity of propodeum not black; the second tergite partially or entirely red, tergites 1-3 with white apical margins or latero-apical white pattern. (Mesosternum partially red; length 13-15 mm.) ..... 3. *natalensis*, new species
   Natal, Zululand, northern Tanganyika, Kenya

b. Males

1. Face and clypeus uniformly white, rarely a dark spot in the middle of face; dorsal pattern of head black. (Lateral lobes of mesoscutum sometimes infuscated; pronotal ridge often partially yellow; mesosternum usually with extensive white pattern; white apical bands on tergites 1-3; length 14 to 15 mm.) ..... 1. *lucifer* (Morley)
   Zululand, Cape Province

   Face and clypeus only laterally white, medially with a broad red longitudinal band; dorsal pattern of head uniformly or predominantly red. ..... 3. *natalensis*, new species
   Zululand, Natal, northern Tanganyika, Kenya

1. *Pseudophatnus lucifer* (Morley), new combination

Fig. 19

Platylabus lucifer Morley, 1917, Ann. South. Afr. Mus., XVII, pp. 203-204, ♂.

Types

Holotype.—♂, with name and type label by Morley. S.A.M.
Neallotype.—♀, "South Africa, East London, 27.VIII.61." C.G.H. II.

Distribution

Eastern South Africa: Zululand (type locality), East London (C.G.H. II.), Grahamstown (C.G.H. II.), Port Elisabeth (Z.M.H.U.).

Preamble

Two forms of this genus occur in South Africa. I collected a series of both sexes of the one (described below as *natalensis*, new species) at Pietermaritzburg, and a series of the other at East London. I have been unable to find reliable differences in structure or sculpture between the two, but the females are chromatically strongly and constantly different. Males are rather variable in color and therefore more difficult to distinguish than females. But one distinctive character seems to be quite constant: in males of *natalensis* there is a broad continuous median longitudinal red band on face and clypeus, whereas in the other species face and clypeus are uniformly white. The holotype of *lucifer* Morley thus belongs to the latter.

Male

Head white, with black dorsal pattern; thorax predominantly black; mesoscutum and scutella entirely, upper parts of propleura and mesoplera more or less extensively ferruginous; mesosternum with more or less extensive white mark; pronotal ridge apically to entirely yellowish, lateral lobes of mesoscutum often more or less extensively infuscated; abdomen black, tergites 1-3 and 6 with narrow white apical bands, the seventh with anal mark; legs black, coxae, trochanters and legs I and II extensively, and the tarsi III partially white; flagellum with white annulus; length 14-15 mm.

Flagellum.—With 43-46 segments; short-oval tyloids on segments 10-19 or 20; sigilla distinct on ventral and dorsal sides. Black, sometimes basally brownish, with white annulus on segments 17 (apex) to 24 (in holotype), 19 or 20 to 24 (in specimens from Cape Province); scape ventrally white.

Head.—Black; the following white: mandible base, face and clypeus entirely, frontal orbits up to lower ocellus, about lower $^2/_3$ of outer orbits (not including malar space) broadly; in holotype uppermost part of vertical orbits and apical margin of cheeks dull reddish.

Thorax.—Black; mesoscutum, and upper part of propleura and mesopleura more or less extensively, ferruginous; lateral lobes of mesoscutum often more or less extensively infuscated; the following white: subalarum, postscutellum, apical margin of scutellum, collare, tegulae, a more or less extensive mark on mesosternum on area of sternauli, sometimes projecting in front onto mesopleura and posteriorly to apex of mesolcus

Legs.—Black; the following white: coxae I and II predominantly, coxae III ventrally more or less extensively, all trochanters (not trochantelli) almost entirely, anterior side of femora and tibiae I and II, segments 3-5 of tarsi III.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally and basally punctate, medially with some longitudinal striae; second and third tergites coarsely rugose-punctate; gastrocoeli fairly large and deep. Black; first tergite sometimes dull reddish; tergites 1-3 and the sixth tergite with narrow apical white bands, the seventh with white anal mark.

Female

Head dorsally black, face and clypeus ferruginous, laterally white; sterna predominantly, pleura partially black; propodeum and upper part of pleura more or less extensively red; mesoscutum and pronotum (the latter except black base) orange, lateral lobes of mesoscutum infuscated; scutellum uniformly, pronotal ridge apically or entirely yellowish; subalarum white, legs red, coxae, trochanters, and anterior legs with white pattern; abdomen predominantly black, tergites 1, or 1 and 2 red, with narrow white apical bands, or latero-apical marks, tergites 6 and 7 with white anal marks; flagellum black with white annulus; length 14 mm.

Flagellum.—With 45 segments, the first about 3.5 times as long as wide, the widest about 2.3 times as wide as long. Black, with dorsal white annulus on segments 10 (apex) or 11 to 16 or 18; scape ferruginous, dorsally partially infuscated.

Head.—Temples and cheeks moderately swollen; face and clypeus fairly strongly and moderately densely punctured; base of clypeus only slightly convex. Black, face and clypeus predominantly light ferruginous; the following white: mandible base, sides of clypeus narrowly, facial orbits, frontal orbits up to level with lower ocellus, about lower two thirds of outer orbits broadly; malar space and apex of cheeks at mandible base black.

Thorax.—Anterior fourth of notauli distinct, mesoscutum finely coriaceous, weakly, and on anterior part moderately densely punctured; scutellum somewhat raised above postscutellum, with gradually rounded apical slope, laterally sharply carinate not quite to the apex. Red, black, orange, and white; the following red: propodeum (except black lower, and sometimes anterior part of metapleura), posterior part of mesopleura including speculum; mesoscutum, scutellum, and pronotum (except black base or lower part) orange; scutellum and pronotal ridge apically or entirely yellowish; lateral lobes of mesoscutum blackish-infuscated; collare, tegulae, subalarum, apical margin of scutellum, and postscutellum white; prescutellar carinae, lateral slopes of scutellum and large patch on mesosternum (on area between sternauli and mesopleura, sometimes more extensive) dull orange; apex of prosternum narrowly pale.

Legs.—Femora fairly slender; coxae III with distinct, dense, light-colored scopa. Red; the following white: coxae I and II and trochanters I and II predominantly, trochanters III apically and more extensively ventrally, anterior side of femora and tibiae I and II; coxae III predominantly black or blackish-brown.

Abdomen.—Postpetiole basally and laterally strongly punctured, medially irregularly, longitudinally striate; second and third tergites densely and coarsely rugose-punctate, interval of gastrocoeli short-striate; gastrocoeli fairly large and deep. Black; first, or first and second tergites red, the second sometimes blackish-infuscated or dull reddish, both tergites with narrow white apical margins or apico-lateral lines; sixth tergite with broad white apical band, the seventh with large white anal mark.

2. *Pseudophatnus glabrinotor* (Morley), new combination

Aglaojoppa glabrinotor Morley, 1919, Proc. Zool. Soc. London, p. 138, ♀.

Types

Holotype.—♀, "Nyasaland, S. W. of Lake Chilwa, 16.I.1914, leg. S. A. Neave". B.M. No. 3b-133.

Distribution

Nyasaland.

Preamble

Differs from *lucifer* Morley ♀ (as described above) by vivid red basic color of head and thorax, including mesoscutum, the lateral lobes of the latter not being infuscated. As in the following form, *natalensis*, black color on thorax less extensive than in *lucifer*, on the propodeum and abdomen, however, more extensive than in *natalensis;* white markings on anterior tergites restricted to small latero-apical marks on second tergite. Structurally like *lucifer* and *natalensis.*

Female

Head vivid red with yellowish-white frontal orbits, without black pattern; thorax vivid red with black sterna and predominantly black propodeum; subalarum and postscutellum white; abdomen black, with white anal pattern on tergites 6 and 7 and small white latero-apical marks on second tergite; first tergite predominantly red; legs predominantly blackish or blackish-brown; anterior legs, including coxae, with white pattern; flagellum black with white annulus; length 13 mm.

Flagellum.—With 42 segments, the first nearly 3 times as long as wide, the widest little more than twice as wide as long. Black, with white annulus on segments 9 (apex) to 17 (base); scape ventrally red.

Head.—Structure as in *lucifer.* Vivid red; yllowish-white band on frontal orbits somewhat widened below level of anterior ocellus.

Thorax.—Structure as in *lucifer;* weak punctation on mesoscutum, however, sparser. Vivid red: the following white: collare, subalarum, apical margin of scutellum, and the postscutellum; the following black: tegulae, sterna, middle of prepectus, area centralis, areae dentiparae, areae spiraculiferae, areae metapleurales except median part, base of propodeum narrowly, declivity of propodeum.

Legs.—Femora fairly slender, coxae III with fairly small scopa. Predominantly blackish to blackish-brown; coxae I and II apically white marked, femora and tibiae I and II white on anterior side.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole distinctly punctured, medially finely striate; space between gastrocoeli short-striate; second and third tergites densely rugose-punctate. Black; first tergite extensively red; fairly small white latero-apical marks on second tergite; sixth and seventh tergites predominantly white.

3. *Pseudophatnus natalensis*, new species

Types

Holotype.—♀, "Natal, Pietermaritzburg, 10.-16.II.63." C.G.H. II.
Allotype.—♂, same locality and date. C.G.H. II.
Paratypes.—4♀♀, 3♂♂, same locality and date. C.G.H. II.

Distribution

Natal: Pietermaritzburg (type locality); Zululand: Mfongosi (S.A.M.); north Tanganyika: Western Usambara Mts., ♂ (C.G.H. II.); Kenya: Nairobi, ♀ ssp.? (S.A.M.).

Preamble

This form is very closely related to *glabrinotor* Morley. I suspect that the two can be associated as subspecies, but hesitate to pronounce that status, because I have seen only one specimen of *glabrinotor*, the type, not enough to establish a clear diagnosis of this form. Differs from *glabrinotor* mainly by much more red on propodeum, sterna, and second tergite and by different white apical pattern on anterior tergites.

Female

Head vivid red, with restricted yellowish-white pattern; thorax vivid red with partially black sterna, and restricted black pattern on pleura and propodeum, excluding most of area centralis; abdomen black, tergites 1 and 2 light to dull red, with either continuous white apical margins or latero-apical marks; sixth and seventh tergites with white anal marks; legs predominantly black or blackish-brown, with femora and coxae III varying to red; coxae I and II more or less extensively white; flagellum black, with white annulus; length 13-15 mm.

Flagellum.—With 43-45 segments, the first segment fully 3 times as long as wide, the widest about 2.3 times as wide as long. Black, with white dorsal annulus on segments 9 (apex) to 17 or 18; scape basally reddish.

Head.—Structure as in *lucifer*. Vivid red; the following yellowish-white: frontal orbits, base of mandibles, usually upper part of facial orbits, sometimes a mark on lower part of outer orbits; upper frons and ocellar region sometimes blackish-infuscated.

Thorax.—Structure as in *lucifer*, but punctation on anterior part of mesoscutum very sparse, mesoscutum a little more shiny. Vivid red; the following white: subalarum, postscutellum, apical margin of scutellum, mark on collare, usually mark on tegulae; the following black: prosternum usually partially to entirely, prepectus usually medially, mesosternum usually medially and in area of sternauli, usually irregular patch on lower part of mesopleura, usually lower part of metapleura more or less extensively, often a mark on base of area centralis and on base of areae spiraculiferae, in one specimen entire area posteromedia.

Legs.—Femora fairly slender; coxae III with fairly small, light-colored scopa. Tibiae and femora blackish-brown, femora III, more rarely also femora I and II, varying to red-brown or red; basic color of coxae usually black, rarely varying to red; tarsi II and III and tibiae III apically more or less extensively black; the following white: apex of coxae I and II and apex of trochanters I more or less extensively, sometimes also apex of trochanters II, anterior side of femora and tibiae I and II.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole laterally and basally punctate, medially usually with some longitudinal striae or some irregular rugae; second and third tergites coarsely rugose-punctate, space between gastrocoeli short-striate. Black, tergites 1 and 2 red, the second sometimes more or less extensively infuscated, both with white apical margins which are usually medially interrupted or reduced to small latero-apical marks on the first tergite and sometimes also on the second; often also the third tergite with small white latero-apical lines or marks; sixth tergite with broad white apical band, the seventh predominantly white.

Male

Very similar to *lucifer* Morley, but face and clypeus not uniformly white, but with a broad, continuous median longitudinal red band; propodeum and head dorsally extensively red.

Head vivid red, face and clypeus laterally white; sometimes restricted black pattern on frons and ocellar region and/or cheeks; thorax predominantly vivid red, sterna with more or less extensive black pattern, sometimes with white mark on area of sternauli; propodeum with restricted black markings; pronotal ridge not yellow-marked, lateral lobes of mesoscutum not infuscated; abdomen black, tergites 1-3 and 6 with narrow white apical bands which are often medially interrupted on the first and/or third tergite, but seldom on the second; seventh tergite with white anal mark; legs black or blackish-brown; coxae, trochanters, and legs I and II extensively, tarsi III partially, white; flagellum with white annulus; length 15 mm.

Flagellum.—With 42-44 segments; short-oval tyloids on segments 10-18 or 19; distinct sigilla on ventral and dorsal side. Black, with complete white annulus on segments 18 to 24 or 25; part before annulus ventrally brown, sometimes yellowish-brown; scape ventrally white-marked or white.

Head.—Vivid red; the following white: mandible base, sides of clypeus, sides of face, frontal orbits, about lower $^2/_3$ of outer orbits; malar space always black, sometimes also middle of frons and ocellar triangle and/or posterior part of cheeks black.

Thorax.—Vivid red; the following white: collare, subalarum, usually apical margin of scutellum and postscutellum, mark on tegulae, sometimes mark on mesosternum at area of sternauli, rarely also a mark on each side of mesolcus near apex of mesosternum, sometimes apex of prosternum and margin of prepectus; the following black: prosternum entirely or predominantly, middle of mesosternum broadly, sides and apex of mesosternum more or less extensively, exceptionally entire mesosternum except above-mentioned white pattern, lower $^1/_3$ to $^1/_2$ of mesopleura, pronotal

base, tegulae partially, metapleura more or less extensively (except upper part), usually base and apex of areae spiraculiferae and base of central area, exceptionally entire central area.

Legs.—Black, or black-brown; the following white: coxae I and II predominantly, usually coxae III ventrally or apico-ventrally, trochanters ventrally, anterior side of femora and tibiae I and II, segments 2 or 3 to 5 of tarsi III, exceptionally also tarsi II medially.

Abdomen.—Black, the first tergite sometimes, rarely first and second tergite red or reddish; tergites 1-3 with narrow white apical bands which are often medially interrupted on the first and third tergite, less often on the second; sixth tergite with white apical margin, the seventh with anal mark.

Remark

One male from eastern Tanganyika, near Morogoro (foot of the Uluguru Mts.) in C.G.H. II. doubtless belongs to this species, but differs from all other specimes by black basic color of head, including median field of face, and by almost uniformly red propodeum. Another male from Western Usambara Mts. is, however, completly typical. By analogy with the ornithological findings, an endemic subspecies in the Uluguru Mts. might well be expected.

One female from Kenya, Nairobi (S.A.M.) also belongs to this species, but differs from the populations of the type locality by lack of the white pattern on apices of tergites 1 and 2, on coxae I and II, and on apex of scutellum, collare, and tegulae. This specimen probably represents a distinct subspecies which, however, can not be described until more material from Kenya and Tanganyika becomes available as foundation for a useful subspecific diagnosis.

11. Genus *Oriphatnus*, new genus

Figs. 20, 21

Type species.—*Lagenesta triangulifer* Morley

Distribution

East Africa: Uganda; West Africa: northwestern Angola, Spanish Guinea, Cameroons.

Preamble

The structure of propodeum and area centralis in this genus is similar to *Pseudophatnus* Heinrich and congruent with *Apatetorops* Heinrich. A number of other structural characters distinguish *Oriphatnus* very clearly from both genera mentioned above. The most striking of these characters is represented by a specialization of the cheeks. These are abruptly constricted shortly before mandible base, in lateral view forming a strong emargination (fig. 20); at this curve the carina genalis ends; the carina oralis is rather highly lamelliform and continues with equal height to the very base of mandible (fig. 21); its upper margin is bent backward toward the above described emargination of the lower cheeks. The clypeus of the female presents another strange character: it is bent toward the mandibles in a gentle curve from base to apex, showing in lateral view a

"Ramses-profile". In contrast to *Leptophatnus* Cameron, the notauli are obsolete; the scutellum is laterally weakly carinate nearly to, or to beyond, middle.

Morphological characters

Flagellum.—Of females distinctly bristle-shaped, long, not so distinctly flattened dorso-exteriorly at about middle as in *Leptophatnus;* ventrally flattened and distinctly widened beyond middle, sharply attenuated at apex. Flagellum of males long, with short row of longish-oval tyloids and with distinct sigilla on ventral and dorsal side.

Head.—Mandibles and clypeus sexually dimorphic, the specialization of oral-genal region, however, shared by both sexes. Mandibles of females robust, but relatively longer than in *Leptophatnus* and the other related genera, slightly tapering toward apex, the upper tooth considerably longer than the lower and not separated from it by a wide gap; clypeus of females distinctly receding toward mandibles in a gentle curve. In males, mandibles relatively much shorter than in females, the upper, longer tooth separated from the lower by a wide gap; clypeus normal. Temples and cheeks not swollen; occiput deeply emarginate, its declivity behind ocellar triangle short; frons distinctly concave up to vertex, the ocellar triangle and middle of frons raised; cheeks before mandible base sharply constricted, carina genalis beyond beginning of constriction obsolete; carina oralis lamelliform, its upper rim bent forward.

Thorax.—Mesoscutum distinctly longer than wide; notauli obsolete; scutellum somewhat raised above postscutellum, dorsally flattened and gradually slanting from base to postscutellum, laterally weakly carinate at base or to beyond middle; propodeum gradually slanting from base to apex in a long, gentle curve; almost entire carination obsolete; area centralis wedge-shaped, basally almost contiguous to postscutellum, several times longer than the strongly abbreviated area posteromedia, laterally not, or weakly carinate, fairly smooth.

Legs.—Long and rather slender; coxae III of females with scopa; tarsi III extensively white in both sexes.

Wings.—Clear; areolet short-petiolate.

Abdomen.—Of females oxypygous, ovipositor somewhat projecting; hypopygium of males obtuse-angled; postpetiole without distinct median field, laterally and basally punctured, medially nearly smooth or very finely striate or rugose; gastrocoeli of medium size, fairly shallow, with pronounced, translucent thyridia; second tergite moderately coarsely rugose-punctate, its apical third, and the third tergite, rather finely sculptured.

1. *Oriphatnus triangulifer* (Morley), new combination

Figs. 20, 21

Lagenesta triangulifer Morley, 1919. Proc. Zool. Soc. London, p. 147, ♀.

Types

Holotype.—♀, "Uganda, Durro Forest, Toro, 4000-4500 ft., 25.-29. Oct. 1911, S. A. Neave". B.M. No. 3b-132.

Neallotype.—♂, "Angola, Quitondo, distr. Calulo, 11.8.-2.9.1957". C.G.H. II.

Distribution

Uganda: Durro Forest (type locality); West Africa: northwest Angola (C.G.H. II), Guinea, and Cameroons (Z.M.H.U.).

Female

Black; tarsi III white, except metatarsus black; thorax predominantly dull-orange or ferruginous, the lateral lobes of mesoscutum, horizontal part of propodeum, and the pronotum black; sometimes very restricted white markings on scutella; frons with transverse white band which excludes scutellar triangle and may be narrowly interrupted medially; sides of clypeus white or white-marked; tergites 1 and 2 with white apical bands, 6 and 7 with white anal marks; length 16 mm.

Flagellum.—With 47 (type specimen) or 46 segments, the first somewhat more than three times as long as wide, the widest fully twice as wide as long. Black, with dorsal white annulus on segments 10 (apex) to 20; segments before annulus apically narrowly, ventrally extensively brownish.

Head.—Structure as described for genus. Black; the following white: clypeus laterally and a broad band on frons surrounding anterior part of ocellar triangle, medially narrowly interrupted in West African specimen (which has the basic color of clypeus dark red).

Thorax.—Structure as described for genus; in type specimen scutellum laterally carinate at base only, in West African specimen to beyond middle. Black are: the entire pronotum, lateral lobes of mesoscutum and prosternum predominantly or entirely, horizontal part of propodeum, and tegulae; apex of scutellum and postscutellum in type specimen white-marked, not in specimen from West Africa; the rest ferruginous, darker on median lobe of mesoscutum than on pleura and mesosternum; in West African specimen more orange-tinged on mesoscutum, orange-yellow on pleura and mesosternum.

Legs.—Predominantly pale brown or pale orange, including coxae and trochanters; basic color of legs III including coxae and trochanters extensively blackish-brown infuscated, metatarsus III black, segments 2-5 of tarsi III white.

Abdomen.—Postpetiole basally and laterally sparsely punctured, medially finely coriaceous; basal part of second tergite densely and moderately strongly rugose-punctate to beyond middle, the white apical part finely sculptured, nearly smooth; third tergite finely and rather densely punctured to beyond middle, then strength of puncturation gradually decreasing toward apex. Black; the following white: narrow apical band on first, broad apical band on second tergite, anal band on sixth, and most of seventh tergite.

Male

Description based on specimens from Angola.

Black; tarsi III white, except metatarsus black; thorax with extensive dull-orange, but without white marks; frons with medially interrupted transverse white band; clypeus white; tergites 1-2 with white apical bands, tergites 6-7 with white anal marks; flagellum black with white annulus; length 16 mm.

Flagellum.—With 44-45 segments and with short, small, longish-oval tyloids on segments 13 or 14 to 19 or 20. Black, with complete white annulus on segments 17 to 27 or 30; scape ventrally not white.

Head.—Face and clypeus moderately strongly and densely punctured; frons up to vertex distinctly concave, temple profile distinctly narrowed behind eyes with slightly curved outline; genae, in lateral view of head with short and deep excavation immediately before mandible base; carina oralis toward mandible base distinctly raised, the elevated lamella not perpendicular, but obliquely bent backward. Black; the following white: broad transverse band on frons, surrounding ocellar triangle up to vertex, interrupted medially by a narrow longitudinal black band, clypeus, mandible base, and sometimes small mark on lower outer orbits.

Thorax.—Notauli obsolete; mesoscutum very finely coriaceous, sparsely and finely punctate; central area of propodeum smooth, its lateral carinae indistinct; rest of propodeum fairly strongly and densely punctured. Black; the following dull orange: median lobe of mesoscutum partially or entirely, short line before prescutellar carinae, prescutellar carinae, scutella (including lateral declivities), apical declivity of propodeum, apex of prosternum, m opleura (except black mark on anterior upper part including subalarum), metapleura entirely, prepectus (except black mark on exterior part), mesosternum (except black medio-apical mark), in specimen from Cameroons also central area of propodeum.

Legs.—Femora long and slender. Legs III black including coxae and trochanters, excluding segments 2-5 of tarsi which are white; femora III sometimes laterally brownish, trochanters III sometimes ventrally pale orange; legs I and II dorsally blackish-brown infuscated including tarsi and coxae; tibiae I and II dorsally only slightly infuscated, whitish on ventral side; coxae I and II ventrally uniformly pale orange, trochanters I and II ventrally whitish, femora I and II ventrally dull orange.

Abdomen.—Base of petiole fairly densely rugose-punctate, its apex without distinct sculpture, with some irregular, fine rugosity; space between gastrocoeli with short, dense striation; rest of second and most of third tergite densely and strongly rugose-punctate. Black; the following white: narrow apical bands on first and sixth tergites, broad apical band on second tergite, most of seventh tergite, and the sides of first tergite narrowly.

Remark

The holotype from Uganda and the female from West Africa certainly belong to the same species, but they are not fully congruent, as mentioned on several occassions in the description above. These differences may perhaps indicate a subspecific differentiation, but one specimen from each locality was not enough for establishing a differential diagnosis.

12. Genus *Fasciphatnus*, new genus

Figs. 23, 24

Type species.—*Fasciphatnus lamelligena*, new species

Distribution

Tropical West Africa: Spanish Guinea.

Preamble

A distinct genus, distinguished by striking structural and chromatic features. Belongs to the group of genera related to *Leptophatnus* Cameron, sharing with the latter the short, broad mandibles with strong teeth separated by a wide gap, and the general structure and sculpture of thorax and abdomen; head and propodeum, however, with highly developed specializations; cheeks above mandible base constricted in a similar way as in *Oriphatnus* Heinrich, carina genalis, however, at constriction not reduced to obsolescence as in the latter genus, but, on the contrary, highly developed, forming a broad brim which runs in straight line from about lower temple region to mandible base; this brim sticks out sideways at a right angle to the surface of the cheeks like the washer under a nut, and makes the constriction of the cheeks into a pocket (fig. 23); propodeum comparatively short, curved downward in a steep, evenly rounded curve from base to apex, without distinct carination, except carina metapleuralis (fig. 24).

Morphological characters

Flagellum.—Of males with a row of longish-oval tyloids and with indication of a short row of sigilla on ventral side.

Head.—Temples somewhat swollen, with broadly rounded outline; ocellar triangle with median longitudinal impression and surrounding furrow; cheeks and carina genalis with specialization as described in preamble; clypeus basally very slightly convex, medio-apically a trifle protuberant, with oblique, slightly raised sides and rounded corners; mandibles short, wide, with a wide gap between apical teeth.

Thorax.—Mesoscutum distinctly longer than medially wide, finely coriaceous with few, scattered, weak punctures; notauli subobsolete, distinct only at the very base; scutellum rather strongly raised above postscutellum, dorsally strongly convex, laterally carinate to about middle, gradually declivous from middle to postscutellum; propodeum as described in preamble; carination of propodeum tends to be entirely lacking, except always sharply developed carina metapleuralis; limitation of area centralis, however, varying from completely absent to discernible.

Legs.—Fairly long and slender.

Wings.—Clear, with dark apical band; areolet quadrangular.

Abdomen.—Postpetiole without distinct median field, laterally and basally punctured, medially very finely rugose or almost smooth; gastrocoeli of medium size and depth; thyridia distinct; second and third tergites coarsely rugose-punctate; hypopygium of males apically bluntly rounded.

1. *Fasciphatnus lamelligena*, new species

Figs. 23, 24

Types

Holotype.—♂, "Span. Guinea, Uelleburg, Benitogebt., 1.-4.II.07, G. Tessmann S. G." Z.M.H.U.

Paratype.—♂, "Span. Guinea, Hintld. Makomo, Tessmann S. G." C.G.H. II.

Distribution

Spanish Guinea.

Male

Wings clear, with deeply infuscated apical band; head, thorax, and abdomen uniformly deep black, except for the yellowish-orange petiole and for a yellowish mark on mandible base; legs predominantly black, including coxae I and II; coxae and trochanters III orange; tarsi III and flagellum with white annulus; length 13-17 mm.

Flagellum.—With 40 segments (type); longish-oval tyloids on segments 16 to 22 or to 23. Black, with complete white annulus on segments 8-16 or 17.

Head.—Structure as described for genus (fig. 23); face fairly strongly and rather densely punctured, with finely coriaceous basic sculpture, slightly shiny; clypeus with scattered, strong punctures, smooth and distinctly shiny; lower part of genae with scattered, fine punctures, above constriction-pocket with a few longitudinal striae or rugae. Black.

Thorax.—Structure as described for genus; propodeum strongly punctate (fig. 24); space of areae dentiparae strongly rugose-punctate; space of central area distinguished by finely coriaceous sculpture. Black.

Legs.—Black, trochanters (not trochantelli) III and coxae III orange; trochanters I and II sometimes with whitish ventral mark; apex of femora I and tibiae I, and sometimes also tibiae II ivory on interior side; segments 3-5 (base) of tarsi III white.

Wings.—Clear; forewings from base of stigma to apex, hind wings to corresponding extent, strongly infuscated.

Abdomen.—Structure and sculpture as described for the genus. Black, only petiole pale orange.

13. Genus *Triangulora*, new genus

Figs. 22, 25

Type species.—*Triangulora pseudileanta*, new species

Distribution

Tropical West Africa: Spanish Guinea, Cameroons.

Preamble

This genus is not distinguished by very striking characters. The fairly small triangular projections at the end of the carinae orales (fig. 25), near mandible base, and the shape of metatarsus III (fig. 22) represent its only outstanding features. In combination, however, with a number of different, other characteristics, the total structure suggests generic distinction, although each trait alone would perhaps not be sufficient to establish it.

Morphological characters

Flagellum.—Of females distinctly bristle-shaped, rather short, exterodorsally flattened at middle, ventrally flattened and distinctly widened beyond middle.

Head.—Thick, temples and cheeks distinctly swollen; cheeks rather wide in lateral view; carina genalis normal and straight; carina oralis apically with triangular projection at mandible base; clypeus without basal convexity, with oblique sides and rounded corners; mandibles short and

wide, with subequal teeth, separated by a wide gap; ocellar triangle with median impression and surrounding furrow.

Thorax.—Mesoscutum longer than medially wide, fairly strongly and moderately densely punctured; notauli obsolete; scutellum convex, apically broadly truncate, laterally sharply carinate to apical truncation; propodeum slanting down from postscutellum to apex in a gradual, gentle curve; central area almost contiguous to postscutellum, widest at the latter, with fairly straight sides, converging from base to apex, almost smooth, and several times longer than area posteromedia; rest of propodeum coarsely punctured; carinae metapleurales and lateral carinae of areae centralis and posteromedia distinct, all other carinae obsolete.

Legs.—Femora rather stout; coxae III of females with indistinct scopa; metatarsus III on interior and exterior sides flattened, laterally compressed thus being widened in vertical dimension and forming a ventral ridge, a formation somewhat parallel to the oriental genus *Ileanta* Cameron (fig. 22).

Wings.—Clear; areolet short-petiolate.

Abdomen.—Tergites 1-3 coarsely sculptured; postpetiole and tergites 1 and 2 dorso-medially irregularly longitudinally striate; rest of tergites 2 and 3 coarsely rugose-punctate; second and third tergites strongly sclerotized and separated from each other; gastrocoeli transverse-oval, each somewhat wider than space between, with pronounced thyridia, their anterior slope covered by transverse, prominent, slightly curved rugae of an unusual shape; apex of female abdomen blunt, ovipositor hidden, approaching a semiamblypygous structure.

Chromatic characters

Similar to the genus *Oriphatnus* Heinrich: head black with white markings; thorax without white markings, dull orange and black; abdomen black with white apical bands on tergites 1-2, white sides of tergites 1-3, and white anal marks; tarsi III partially white.

The following is a selection of the 10 most distinctive features of this genus:

1. Mandibles short, wide, with wide gap between teeth.
2. Carina oralis apically with distinctly projecting, triangular lamella (fig. 25).
3. Clypeus normal, neither receding nor basally convex, but with oblique sides and rounded corners.
4. Notauli obsolete.
5. Scutellum convex, laterally carinate.
6. Propodeum almost exactly as in *Apatetorops* Heinrich.
7. Anterior tergites coarsely sculptured, partially longitudinally striate.
8. Gastrocoeli transverse, each somewhat wider than space between, rather deep.
9. Apex of abdomen of females blunt, approaching semiamblypygous shape.
10. Metatarsus III laterally compressed, except dorsally, and widened in vertical dimension.

The characters 1, 4 and 6, as well as the chromatic pattern, suggest close relation to *Oriphatnus* Heinrich, but characters 2, 3, and 7-9 exclude generic association of the two. If we were to ignore the apical projection

of the carina oralis as a distinctive feature and try, on this assumption, to run this form through the key to the genera of the Protichneumonini presented in this paper, we would arrive at the genus *Liojoppites* Heinrich (from southeastern Africa); I am convinced, however, that the parallel feature of these two forms are mainly a matter of convergency; besides, there are still characters 6, 9, and 10 which seem to exclude generic identity with *Liojoppites*.

1. *Triangulora pseudileanta*, new species

Figs. 22, 25

Types

Holotype.—♀, "Guinea, Wester., S." Z.M.H.U.
Paratype.—♀, "S. O. Kamerun, Lolodorf, L. Conradt 95." C.G.H. II.

Distribution

Tropical West Africa: Guinea, Cameroons.

Preamble

All essential structural characters have already been mentioned in the diagnosis of the genus. The species description below is therefore mainly confined to color.

Female

Head black, with white marks; thorax black with extensive, dull-orange markings; median lobe of mesoscutum, scutella and central area dull orange; no white marks on thorax; abdomen black; sides of tergites 1-3, apical bands on tergites 1 and 2, and anal marks on sixth and seventh tergite, white; legs predominantly orange; tibiae more or less, tarsi fairly strongly, infuscated; segments 2-5 of tarsi III white; flagellum black with white annulus; in holotype coxae III black, femora III blackish-brown; length 15 mm.

Flagellum.—With 38 segments, the first about 3.5 times as long as wide, the widest about 2.5 times as wide as long. Black, with dorsal white annulus on segments 7 (apex) to 15; segments before annulus apically narrowly brownish; scape black.

Head.—Black; the following white: mandible base, apex of clypeus narrowly, sides of clypeus, sides of lower half of face, the white band narrowed above into a point, frontal and vertical orbits, the white projecting triangularly below ocelli toward middle of frons, a large rounded mark on lower part of cheeks.

Thorax.—Dull orange; the following black: pronotum uniformly, prosternum (except whitish apex), prepectus laterally (in type only), mesosternum (in type only), patch on upper anterior part of mesopleura, lateral lobes of mesoscutum, anterior part of median lobe of mesoscutum, lateral areae of horizontal part of propodeum.

Legs.—Yellowish-orange, the tarsi blackish-infuscated, segments 2-5 of tarsi III white; sometimes legs III, including coxae, blackish (type); all tibiae and femora dorsally slightly infuscated, the tibiae III more strongly than the rest.

Abdomen.—Black; tergites 1-2 with white apical bands, sides of tergites 1-3 white; sixth tergite with broad medially narrowed white apical band, the seventh tergite predominantly white.

14. Genus *Chasmopygium*, new genus

Figs. 35, 36

Type species.—*Chasmopygium carotifer*, new species

Distribution

Southwestern Tanganyika.

Preamble

A quite distinct genus, with gradually backward-sloping propodeum, strongly tapering and elongate, carrot-shaped area superomedia (fig. 36), separated by anterior constriction from area basalis, with subobsolete notauli, aciculate postpetiole, carinate scutellum, and an elevated lateral ridge on clypeus and lower apex of face (fig. 35).

Morphological characters

Flagellum.—Of females fairly long and slender, bristle-shaped, strongly attenuated at apex, ventrally flattened, but scarcely widened beyond middle.

Head.—Temples short, a trifle swollen; temple profile curved and slightly narrowed behind eyes; cheeks moderately wide in lateral view, slightly swollen; occiput strongly emarginate; ocellar triangle with distinct median impression and surrounding furrow; median field of face moderately prominent; clypeus basally distinctly convex, its apical border not quite straight, a trifle emarginate, with distinct, median projection (fig. 35); sides of clypeus together with lower part of sides of face form a prominent ridge; face and clypeus rather densely and strongly punctured; mandibles stout and wide, with a wide and short lower and a longer, pointed upper tooth, the two separated by a wide gap.

Thorax.—Mesoscutum distinctly longer than medially wide, finely coriaceous, with moderately sparse puncturation, the punctures along the sides of median lobe running into irregular transverse rugae; notauli subobsolete; scutellum somewhat raised above postscutellum, laterally carinate nearly to apex, dorsally with some strong punctures and lateral longitudinal rugae; propodeum (fig. 36) with distinct basal furrow, and sloping gradually from base to apex in a gentle curve; area centralis about 3 times as long as area posteromedia; carination complete, except carina coxalis lacking; carina separating areae superomedia and basalis not quite complete, the two areae separated, however, by a strong constriction; area superomedia elongate and narrow, carrot-shaped, gradually narrowed toward apex into a point, rather regularly transversely rugose.

Legs.—Moderately long and slender; coxae III without scopa.

Wings.—Clear; areolet quadrangular.

Abdomen.—Of females oxypygous, elongate and narrowed as in *Chasmias* Wesmael; postpetiole with slightly indicated, densely aciculate median field, laterally punctate; gastrocoeli fairly small and rather shallow,

with distinct thyridia, space between short-striate; second and third tergites moderately strongly and very densely punctured.

Chromatic characters

Black, without white markings, except anal marks and white frontal orbits; mesoscutum orange-yellow.

1. *Chasmopygium carotifer*, new species

Figs. 35, 36

Types

Holotype.—♀, "S. W. Tanganyika, Mbeya, 18.XII.62." C.G.H. II.

Distribution

Southwestern Tanganyika: Mbeya.

Female

Black; frontal orbits white; pronotum predominantly, mesoscutum and scutella orange-yellow; sixth tergite with broad white apical band, seventh tergite with large white anal mark; thorax laterally and ventrally, anterior tergites, and legs very slightly brownish; flagellum black with white annulus; length 16 mm.

Flagellum.—With 40 segments, the first about 2.5 times as long as wide and by about a fourth shorter than the second, the widest nearly 1.5 times as wide as long. Black, with almost complete annulus on segments 9-15.

Head.—Structure as described for genus; frons, vertex, occiput and cheeks without puncturation, except the sparsely and finely longitudinally rugose-punctate apex of cheeks and some transverse rugosity immediately below ocellar triangle. Deep black; frontal orbits white up to lower ocellus; vertex dull brownish.

Thorax.—Structure as described for genus. Black; mesosternum, mesopleura, and metapleura partially dull brownish; pronotum, except black collare and pronotal base, the mesoscutum, and scutella orange-yellow; prepectus exteriorly and mesosternum medio-apically dull orange; no white markings.

Legs.—Black, femora blackish-brown, tibiae and femora I and less distinctly apex of femora II and the tibiae II ivory on anterior side; trochanters I apically whitish.

Abdomen.—Black, anterior tergites faintly dull brownish; sixth tergite with broad white apical band, the seventh with large white apical mark.

15. Genus *Genaemirum* Heinrich

Figs. 27-34

Genaemirum Heinrich, 1935, Mission Scientifice de l'Omo, III, pp. 229 30.

Type species.—*Genaemirum mesoleucum* Heinrich

Distribution

Tropical East Africa and Cape Province.

Preamble

Agrees with *Coelichneumon* Thomson in general appearance, sculpture of anterior tergites, oxypygous abdomen of females, and depth of gastrocoeli. Differs from *Coelichneumon* principally by structure of propodeum (fig. 34), which is longer, the areae dentiparae more gradually curving downward almost to the very base of coxae III, the area superomedia united with the area basalis, forming one prolonged smooth and shiny central area with its anterior carina immediately contiguous to the postscutellum. *Genaemirum* shares the above-mentioned features of the central area of the propodeum with *Afrocoelichneumon* Heinrich (although in the latter genus the central area is usually wider and less prolonged). Differs from *Afrocoelichneumon* by highly specialized head structures of the females (figs. 27-33) which are manifested in strange appendages of the apex of genae and/or hornlike projections on the frons and by the unusual short, filiform flagellum of females. Basic color as in *Coelichneumon,* black or red, without white anal marks; head and thorax with white marks, mesoscutum in all known species with large white or yellow median mark.

Morphological characters

Flagellum.—Of females filiform, stout, ventrally not distinctly flattened and not widened.

Head.—Thick, temples fairly wide, with curved outline; malar space very short; in females of some species (including type species) apex of cheeks at mandible base more or less, sometimes enormously, projecting, forming strange appendages (figs. 28-33); antennal cavities pronounced, separated above from the lower part of frons in females by a bisinuate carina, or in some other species (including type species) by two sharply projecting horns; carinal junction sometimes with triangular projection; clypeus short and wide; mandibles normal, rather stout.

Thorax.—Mesoscutum as in *Coelichneumon,* but basal third of notauli distinct; scutellum flat to slightly convex, laterally not carinate; propodeum long, areae dentiparae gradually and deeply curved down to almost the base of coxae III; area superomedia and basalis amalgamated into one elongate central area (as in the genus *Afrocoelichneumon* Heinrich, but narrower) with its bordering carina anteriorly contiguous to postscutellum.

Legs.—Moderately stout; coxae III without scopa in the five known species.

Abdomen.—Of females strongly oxypygous; postpetiole with distinct median field, the latter and middle of anterior tergites strongly longitudinally striate, exceptionally punctured; anterior tergites sharply separated from each other; gastrocoeli deep and large, as in *Coelichneumon.*

Key to the species of *Genaemirum* Heinrich
Females and Males

1. Basic color of mesoscutum red or chestnut-brown. (Abdomen predominantly yellowish, red or brown.) 2
   Basic color of mesoscutum black. (Abdomen entirely or predominantly black; frons with two horns.) 5
2. ♂♂. Only one species known. (Abdomen yellowish, except black first segment; frons without horns or transverse carina; genae without appendages,

but carinal triangle triangularly projecting; basic color of thorax black, except red mesoscutum and rich white markings; length 15 mm.) ..... 2. *varianum* (Tosquinet), ♂ Eastern Cape Province

♀♀. 3

3. Frons with short, hornlike projections (fig. 27); cheeks without appendages; carinal triangle without projection; flagellum with annulus. (Basic color of entire body vivid chestnut-red, tibiae and tarsi II and III extensively infuscated; length 14 mm.) ..... 3. *vulcanicola*, new species, ♀ S. Tanganyika: Rungwe Volcano

Frons without horn-like projections, instead with bisinuate transverse carina separating it from the antennal cavities. 4

4. Middle of face with high, longitudinal horn-like projecting lamella; cheeks without bizarre appendages; median field of postpetiole densely punctured. (Frons above transverse carina with almost triangular elevated coarsely transversely rugose shield; length 15 mm.) ..... 5. *rhinoceros*, new species, ♀ Uganda: Zika Forest

Middle of face without longitudinal projecting lamella; cheeks with bizarre appendages; median field of postpetiole longitudinally striate. (Carinal triangle forming a sharply triangular projection; flagellum without annulus.) ..... 2. *varianum* (Tosquinet), ♀ Northern Cape Province

5. Cheeks with monstrous, long appendages (figs. 32, 33); clypeus enormously enlarged, hiding mandibles entirely. (Length 14 mm.) ..... 4. *doryalidis*, new species, ♀ Kenya

Cheeks without long appendages, instead apex of cheeks elevated into a collar, which is curved backward, away from the mandible base (figs. 28, 29); clypeus normal. (Length 14 mm.) ..... 1. *mesoleucum* Heinrich, ♀ Kenya: Mt. Elgon, 3500 m

1. *Genaemirum mesoleucum* Heinrich

Figs. 28, 29

Genaemirum mesoleucum Heinrich, 1935, Mission Scientifique de l'Omo, III, p. 230, ♀.

Types

Holotype.—♀, Kenya, Mt. Elgon, 3500 m. M.N.H.N.

Distribution

Kenya.

Preamble

Black basic color, apical genal appendages of medium size, and distinct frontal horns distinguish this species.

Female

Black; large white median mark on mesoscutum; scutella white, as are pronotal ridge and base; length 14 mm.

Flagellum.—Slender, filiform, neither widened nor ventrally flattened beyond middle, with 33 segments, about the 10th square. Black, segments 12-14 with indication of white on their base.

Head.—Cheeks very short, malar space scarcely as long as one-third of the width of mandible base; apex of cheeks highly elevated into a kind of collar which is bent backward from the mandible base (fig. 29); antennal cavities deeply excavated, frons above their upper border slightly convex, with two short, acutely projecting horns (fig. 28); face and clypeus sparsely

and fairly strongly punctured, frons rugose. Black; the following white: lateral corners of clypeus, sides of face, orbits broadly around eyes, narrowly interrupted at temples.

Thorax.—About basal third of notauli distinct; scutellum flat; central area of propodeum elongate and comparatively narrow; declivity of propodeum scarcely half as long as horizontal part medially; area posteromedia and areae posteroexternae not separated by carinae. Black; the following white: pronotal ridge and base, subalarum, marks on prepectus, scutella, one large median mark on apical part of median lobe of mesoscutum.

Legs.—Black; the following white: dorsal marks on coxae I and II, apex of femora I internally.

Abdomen.—Gastrocoeli rather deep, triangular; median field of postpetiole distinct, longitudinally rugose; middle of tergites 2-4 basally longitudinally striate. Black.

2. *Genaemirum varianum* (Tosquinet), new combination

Figs. 30, 31

Amblyteles varianus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, pp. 97-99, ♂♀.

Types

Holotype.—♂, "Capland, Krebs." No. 9213. Z. M. H. U.

Allotype.— ♀, "Capland, Krebs." No. 9213, torso without abdomen. Z.M.H.U.

Distribution

Probably region of Grahamstown, eastern part of Cape Province. (See introduction, section "Location of some type localities").

Preamble

Related to type species, but appendages of genae of females considerably larger and frontal horns obsolete (fig. 30), being replaced by a bisinuate, transverse carina; in the male, genae without appendages and frons without transverse carina. Abdomen yellowish.

Male

Head and thorax black with rich white pattern, mesoscutum red with white median mark, abdomen yellowish, except base; flagellum black; legs predominantly yellow, the tarsi, coxae, and trochanters black, the latter with some white markings; length 15 mm.

Flagellum.—Black; scape ventrally white.

Head.—Almost square in front view; genae without appendages, the carinal junction, however, with sharply triangular, tooth-like projection (as also present in the females); frons without transverse carina on upper border of antennal cavities, its upper part and vertex strongly striate in different directions; a slight vertical furrow below lower ocellus. Black; the following white: face, clypeus, cheeks up to temple region (except apical part with malar space), facial orbits up to above antennal base; upper part of frontal orbits red.

Thorax.—Black; mesoscutum red; the following white: collare (except middle), pronotal base, pronotal ridge broadly, subalarum, median mark on mesoscutum, large approximately triangular mark on lower part of mesopleura, scutellum, except base.

Legs.—Stout. Yellow; tarsi, coxae, and trochanters black; legs I and II dorsally blackish-infuscated; white: ventral marks on coxae I and II.

Abdomen.—Median field of postpetiole distinct, longitudinally striate; gastrocoeli deep and large, triangular, space between them aciculate. Yellowish; first segment black.

Female

Head and thorax red with white markings; sterna and areae coxales blackish; mesoscutum with median white mark; coxae red.

Flagellum.—Unusually short, filiform, with 26 segments. Black, without annulus.

Head.—Apex of cheeks projecting laterally from the malar space, forming a bizzare appendage which has the shape of a blunt triangle and is convex in front and concave behind; carinal junction forming a sharply triangular, tooth-like projection; the strongly enlarged antennal cavities separated above from the frons by an elevated, bisinuate transverse carina; vertex and upper part of frons strongly striate in different directions. Red with white markings as in male and, in addition white marks on vertical orbits.

Thorax.—Red, with white markings as in male; sterna and areae coxales blackish.

Legs.—As in male, but basic color of coxae red, without white markings.

Abdomen.—Missing in type as already mentioned in original description.

3. *Genaemirum vulcanicola*, new species

Figs. 27, 34

Types

Holotype.—♀, Tanganyika, Rungwe Mts., 2600 m, 12.XI.62." C.G.H. II.
Paratype.—♀, same locality, 1.XI.1962. Collection H. Townes.

Distribution

Known only from type locality.

Preamble

A species which shares with the type of the genus the frontal horns and other structural characters, but not the genal appendages.

Female

Basic color of entire body and legs vivid chestnut-brown, head and thorax with rich ivory markings; central mark on mesoscutum and scutellum ivory; flagellum black with white annulus; tibiae and tarsi II and III extensively infuscated; length 14 mm.

Flagellum.—Fairly short, filiform, not widened and not distinctly ventrally flattened beyond middle, imperceptibly attenuated at apex, with 37 segments, the first twice as long as wide, the seventh square. Black; segments 8-18 with complete white annulus.

Head.—Temple profile slightly narrowed, with curved outline; malar space one-third as long as width of mandible base; apex of cheeks without

projecting appendage; frons irregularly rugose below ocelli, with two sharply pointed horns above upper border of antennal cavities (fig. 27); clypeus strongly transverse, medio-apically a trifle projecting; mandibles of normal structure, but distinctly swollen toward apex. Chestnut-brown; the following ivory: clypeus laterally, orbits broadly around eyes, narrowly interrupted only at temples and at malar space; blackish mark on temples.

Thorax.—Basal third of notauli distinct; scutellum flat, laterally not carinate; central area of propodeum smooth, apically confluent with area posteromedia, parallel-sided and not much less than twice as long as area posteromedia (fig. 34). Chestnut-brown; tegulae, longitudinal median band on mesosternum, pronotum medially and small mark below subalarum black; the following ivory: collare, pronotal ridge and base broadly, rounded central mark on mesoscutum, subalarum, lateral marks on prepectus, small mark on lower, apical part of mesopleura, scutellum, upper part of carinal triangle.

Legs.—Coxae shiny, fairly densely and finely punctured, without trace of scopa. Chestnut-brown; the following infuscated: trochanters extensively, apex of femora III and the tibiae III dorsally, coxae I and II ventro-apically, tarsi III, tibiae and tarsi II slightly; the following ivory: dorsal marks on coxae I and II, apex of femora I and the tibiae I internally, apical margin of trochanters I and II partially.

Abdomen.—Comparatively narrow and elongate, oxypygous; median field of postpetiole distinct; tergites 1-4 medially longitudinally striate; gastrocoeli deep; anterior tergites sharply separated from each other, with slightly projecting apical corners; second tergite distinctly longer than apically wide, the third somewhat wider than long. Chestnut-brown; apical tergites slightly infuscated.

4. *Genaemirum doryalidis*, new species

Figs. 32, 33

Types

Holotype.—♀, "K. Elburgon, Kenya Forest Department, ex *Doryalis abyssinica*". B.M. No. 3b-2120.

Distribution

Kenya.

Preamble

In this species the appendages of cheeks have reached a monstrous degree (figs. 32, 33); simultaneously the entire clypeus has been produced enormously, far beyond labrum and mandibles, which are entirely hidden and invisible. The basic black color of the entire body with white median mark on the mesoscutum and fairly rich other white markings on head and thorax is similar to *mesoleucum* Heinrich.

Female

Black, including legs II and III; head and thorax with rich white markings, scutella and median mark on mesoscutum white; apical margins of tergites 2-7 reddish; legs I orange, except coxae and trochanters; length 14 mm.

Flagellum.—Lacking in type, except first segment which is black and scarcely twice as long as wide; scape and pedicel black, ventrally ferruginous, the former of a peculiar, depressed shape, dorsally flattened and polished.

Head.—(Figs. 32, 33); occiput short, fairly steeply declivous behind eyes and ocellar region; temple profile in vertical view short, rounded and somewhat narrowed behind eyes; frons below ocelli strongly convex, irregularly rugose, culminating in two strong horns, which are flattened in front and sharply pointed above; cheeks extraordinarily receding behind eyes, gradually stronger depressed toward apex and drawn out into monstrous, flat, spade-shaped appendages; face abbreviated, with a small hornlike projection in the middle of upper border; clypeus strongly enlarged, considerably longer than the face, widened gradually and slightly bent upward from base to apex, forming an enormous shield, behind the base of which labrum and mandibles are hidden; the mandibles are of normal shape, their base is situated behind the base of the gap between clypeus and cheek appendages. Black; the following white: facial, frontal and vertical orbits broadly, band on the median part of outer orbits; large mark on base of cheek appendages; clypeus reddish, laterally whitish.

Thorax.—Structure as described for the genus. Black; the following white: collare except middle, pronotal ridge broadly, subalarum, large median mark on mesoscutum, scutellum, postscutellum, marks on upper ends of prepectus, carinal triangle; a pale mark on middle of pronotal base.

Legs.—Femora short and stout. Black, very base of femora II and III reddish; legs I orange, except coxae and trochanters.

Wings.—Nervulus strongly postfurcal; areolet pentagonal, narrowed in front; clear.

Abdomen.—Structure as described for the genus. Black; tergites 2-7 apically dark reddish.

Remark

The note on the label of the holotype "ex *Doryalis abyssinica*" is missleading. This is not the name of a host from which the specimen was reared, but the name of a tree, *Dovyalis abyssinica* (A. Rich.) Warb. (family Flacourtiaceae). The correct data on the label should have been "from wood of dead tree, *Dovyalis abyssinica*".

We may suppose that the monstrous head structure of the species treated above, is connected with some extraordinary biological features. It would, therefore, not be surprising to find a specimen emerging from a dry wood. To find the details of the life history of the species and its host, would be one of the most rewarding tasks of Ethiopian ichneumonology.

5. *Genaemirum rhinoceros*, new species

Types

Holotype.—♀, "Zika Forest, Mengo, IX.18. '63, Uganda, G. A. Lancaster." C.G.H. II.

Distribution

Uganda.

Preamble

The species differs from all others by a horn-like projecting longitudinal lamella on the middle of face, by neatly and densely punctured postpetiole, and by a shield-like, raised area on the frons.

Female

Basic color of head white, of thorax vivid chestnut-red with most of the scutellum, a median mark on the mesoscutum, and extensive other markings, white; abdomen light ferruginous-red, tergites 1 and 2 with small apico-lateral white marks; legs predominantly light ferruginous-red, coxae I and II extensively white, coxae III with large dorsal white mark, tarsi infuscated; flagellum with white annulus; length 15 mm.

Flagellum.—As described for the genus; apically slightly attenuated; with 35 segments, the first 1.5 times as long as wide, the fifth square. Black, with dorsal white annulus on segments 7 (apex) to 16; scape ventrally ferruginous.

Head.—As described for the genus; carinal junction with triangular projection of moderate size; carina oralis extends (bypassing the hind corner of mandible) over the lower end of cheeks toward malar space, apically curving upward shortly before margin of eye; clypeus without lateral corners, its apical border forming an obtuse angle, with its slightly pointed vertex in the middle; middle of face with horn-like projecting longitudinal lamella; median part of frons forms a roughly triangular shield which is below separated from the antennal cavities by a transverse M-shaped carina and which includes above the lower ocellus; this shield has a fine, longitudinal median ridge and is covered on each side of the ridge by coarse, sharply prominent, curved, subparallel rugae. White; antennal cavities, vertex behind ocellar region, and posterior belt of cheeks chestnut-red; temple region black to the very border of eyes; frontal shield blackish-infuscated; middle of clypeus narrowly ferruginous, as is the facial, horn-like lamella.

Thorax.—As described for the genus; base of scutellum laterally weakly carinate. Vivid chestnud-red; the following white: collare, pronotal ridge and base broadly, subalarum, large oblong median mark on mesoscutum, scutellum (except laterally), postscutellum, an almost parallel-sided longitudinal band on lower half of mesopleura (extending in front onto prepectus), a large mark on posterior part of metapleura, carinal triangle, a mark on each side of the apical slope of the propodeum (covering the apical part of areae dentiparae and exterior margin of declivity); the following black: pronotum extensively, patch below subalarum on mesopleura, tegulae, exterior margin of mesoscutum, lateral slopes of scutella, area posteromedia, metapleura below and above white mark, prepectus partially.

Legs.—As described for the genus. Light ferruginous-red; the following white: coxae I predominantly, coxae II apically and dorsally, dorsal interior part of coxae III, trochanters I and II ventrally extensively, tibiae I, and apex of femora I on anterior side; tarsi I and II slightly infuscated toward apex, tarsi III apically blackish; dorsal exterior side of coxae III black.

Wings.—Areolet rhomboidal.

Abdomen.—Gastrocoeli and general structure as described for the genus, sculpture different: postpetiole neatly and densely punctured all over, the median field indistinct; tergites 2 and 3 moderately coarsely and rather densely rugose-punctate, without longitudinal striation, except at the extreme base of second tergite, between gastrocoeli. Light ferruginous-red; tergites 1 and 2 with small latero-apical white marks.

16. Genus *Liojoppa* Szépligeti

Figs. 38, 39, 41

Liojoppa Szépligeti, 1910, Sjöstedt Kilim. Meru Exped., VIII, p. 66.

Type species.—*Liojoppa lucida* Szépligeti, monobasic.

Distribution

Tropical East and West Africa, the type species at medium altitudes, usually found at the foot of the cloud forest. *Liojoppa minor,* so far known by one specimen only, seems to inhabit low altitudes.

Preamble

A very distinct Ethiopian genus of somewhat arbitrary taxonomic position. A number of its characters, such as structure of mandibles, of upper part of head, propodeum, and abdomen seem to indicate close relationship to the tribe *Compsophorini* Heinrich. On the other hand, the polished mesoscutum, the completely flat, even depressed, noncarinate scutellum, and also the shape of face and clypeus, are different from all known forms of the latter tribe. Whether the similarities are a matter of convergency or indications of true relationship is unknown. Unless future discoveries of biological data should reveal contradictory facts, I believe that the genus is better placed among the *Protichneumonini* than the *Compsophorini.*

The most characteristic feature of this genus, as represented by the type species, is shown by the structure and sculpture of the propodeum (fig. 38). It is short, and declivous from base to apex in one continuous, slightly curved slope of almost polished sculpture, the entire carination being obsolete as if sanded down, the areolation being indicated only by a certain pattern of infuscated patches which correspond in their arrangement to the center parts of the different areae. In contrast to the smooth mesoscutum and propodeum, the sculpture of abdomen (fig. 39) is extremely coarse, tergites 1-4 being strongly sclerotized, separated from each other by deep sutures, and strongly, longitudinally striate medially. All the above applies to the type species and its different geographical subspecies. In the species *minor,* described below, the propodeal slope is less smooth and the abdominal sculpture less coarse.

Basic color of abdomen in type species is yellow or orange, or yellow and orange, in *minor* red; head and thorax yellow with black marks, basic color of mesoscutum black or blood-red with yellow median lines.

Morphological characters

Flagellum.—Of females bristle-shaped, moderately long, with elongate, slender basal segments, ventrally flattened and slightly widened beyond middle, moderately attenuated at apex; of males with short row of short, elliptical tyloids, the longest covering about the median half of the length of segments.

Head.—Strongly built with temple profile broadly rounded, not narrowed behind eyes; cheeks in lateral view broad and distinctly swollen; clypeus and face not clearly separated, the latter with rather narrow, very slightly elevated median field, the former with well-developed foveae, apically not quite straight, but very slightly curved, without lateral corners; malar space with distinct longitudinal suture on lower part; carina genalis sometimes curved apically, carina oralis sometimes lamelliform (fig. 41); mandibles very short and wide, with subequal, strong apical teeth, separated by a wide gap; face and clypeus sparsely and fairly finely punctured, rest of head smooth.

Thorax.—Mesoscutum about as long as wide, polished; notauli obsolete; scutellum perfectly flat, not at all raised, laterally not carinate, but upper surface separated by a sharp edge from lateral declivities; propodeum as described in preamble; in the type species outline of area superomedia scarcely visible, it is strongly elongate, narrow, anteriorly reaching almost the postscutellum, still more narrowed toward apex; area basalis obsolete; in *minor*, new species, carination fairly distinct; area superomedia of the same shape, more than three times as long as medially wide.

Legs.—Moderately stout; coxae of females, in type species with scopa.

Wings.—Clear, areolet quadrangular.

Abdomen.—Of females oxypygous; hypopygium of males short and triangular; median field of postpetiole clearly defined at base, subobsolete at apex, strongly longitudinally striate; tergites 2-4 strongly sclerotized and sharply separated from each other, dorsally extremely strongly longitudinally striate in type species, the striae widely separated, the ridges between them very high and sharp; gastrocoeli large and deep, transverse-triangular, space between considerably narrower than one of them; thyridia pronounced; in *minor* striation of anterior tergites moderate, much less pronounced.

Key to the species and subspecies of *Liojoppa* Szépligeti
Females and Males

1. Carina genalis with distinct curve at apex before mandible base; carina oralis highly lamelliform, meeting the carina genalis in a sharply projecting angle below mandible base; coxae III without, or with very small and indistinct scopa; mesoscutum black with long yellow median lines which usually extend to its anterior border. 2

   Carina genalis straight to apex, not curved before mandible base; carina oralis not, or moderately lamelliform; coxae III sometimes with distinct scopa; mesoscutum with abbreviated yellow median lines which never reach its anterior border. 5

2. ♀♀. 3

   ♂♂. 4

3. Flagellum with 35-37 segments, moderately attenuated apically; femora III and abdomen orange; length 10-12 mm ..... 2. *occidentalis*, new species, ♀ Spanish Guinea

   Flagellum with 40 segments, strongly attenuated apically; femora III and abdomen predominantly pale lemon-yellow, apically light orange-tinged; length 13-14 mm. ..... 3. *centralis*, new species, ♀ Congo, Eala

4. Abdomen orange, anterior tergites (at least the first, sometimes first to fifth) with black median patches; areae of horizontal part of propodeum predominantly black, surrounded by a network of yellow bands; length 9-11 mm.

..... 2. *occidentalis*, new species, ♂
Spanish Guinea

Anterior three to four tergites pale lemon-yellow, not black-marked; propodeum yellow, sometimes with three black marks; length 13-14 mm. .....
..... 3. *centralis*, new species, ♂
Congo, Eala

5. Abdomen basally lemon-yellow, apically orange-tinged in females, usually apically black in males; mesopleura predominantly yellow, with black marks below subalarum; propodeum yellow with reddish or blackish "leopard-skin" pattern; length 10-13 mm. ..... 1. *lucida* Szépligeti 6

Abdomen red, first tergite predominantly black; mesopleura black, with transverse white band on lower half; propodeum black with restricted white markings; length 8 mm. ..... 4. *minor*, new species, ♀
Angola

6. Basic color of propodeum black, except metapleura; areae of horizontal part and declivity outlined by a network of narrow yellow bands. (Basic color of mesoscutum blood-red; tibiae and tarsi III black; length 10 mm.) .....
..... 1c. *lucida ulugurorum*, new subspecies, ♀
Eastern Tanganyika, Uluguru Mts.

Basic color of propodeum yellow with or without black "leopard-skin" pattern. (Length 11-13 mm.) 7

7. ♀♀. 8
♂♂. 9

8. Propodeum with some orange-red, but without black markings. (Basic color of mesoscutum red.) ..... 1d. *lucida ufipae*, new subspecies, ♀
Southwestern Tanganyika: Ufipa Plateau; Eastern Congo: Lake Kivu

Propodeum with central black patches on some, or all, areae of horizontal part, creating a "leopard-skin" pattern. (Basic color of mesoscutum black.) .....
..... 1a. *lucida lucida* Szépligeti, ♀
Northern Tanganyika: Mt. Kilimanjaro, Mt. Meru, W. Usambara Mts.; Kenya: Mt. Elgon

9. Black mark on middle of face and on middle of postpetiole. (Only apices of femora and of tibiae III infuscated.) ..... 1b. *lucida africana* (Morley), ♂
Uganda

No black mark on middle of face and on middle of postpetiole. (Tibiae and tarsi III predominantly or entirely black; apical tergites usually black; propodeum with black "leopard-skin" pattern.) .....
..... 1a. *lucida lucida* Szépligeti, ♂
Northern Tanganyika and Kenya

1. *Liojoppa lucida* Szépligeti

Figs. 38, 39

Distribution

Northern and eastern Tanganyika: Mt. Kilimanjaro (type locality), Mt. Meru, West Usambara Mts., Uluguru Mts.; southern Tanganyika: Ufipa Plateau; Kenya: Nairobi; Congo.

Preamble

This species, like *Corymbichneumon connexius* Morley, is a member of the high-mountain cloud-forest fauna, although it prefers the lower zones of the forest and is most frequently found at altitudes of about 1500 m. Like the other *Ichneumoninae* of this society, it displays a high degree of geographical variability. Wheter all the widely separated forest-island forms should be regarded as subspecies of the same species, or some which have more strongly differentiated, as species, is an arbitrary question.

Female

Coxae III with distinct, somewhat elevated scopa; basic color of body and legs pale yellow, varying geographically to predominantly orange; head and scutellum dorsally black with yellow pattern, mesoscutum varying from black to blood-red with longitudinal yellow lines, of geographically varying extent; propodeum yellow, with reddish, or more often blackish-infuscated median patches on the areae of the horizontal part and of the area posteromedia which create a "leopard-skin" pattern on the propodeum, unique among Ethiopian Ichneumoninae; in some subspecies black color on propodeum predominant; flagellum black, with white annulus; length 11-13 mm.

Abdomen.—Characteristic for the species is the fairly broad abdomen, with the second tergite only very little longer than apically wide and the third and fourth distinctly wider than long; also distinctive is the very strong striation on the surface of tergites 2-4, with very sharp and high ridges between wide striae (fig. 39).

Male

Generally as the female; flagellum without annulus; apical tergites in the nominate form black; tibiae and tarsi III geographically varying with or without infuscations.

Flagellum.—With elongate-oval tyloids on segments 10-18 (tyloids sometimes hard to recognize as they are partially hidden by transverse bristle-ridges), the longest not reaching bases and apices of segments.

1a. *Liojoppa lucida lucida* Szépligeti

Liojoppa lucida Szépligeti, 1910, Sjöstedt's Kilim.-Meru Exped., VIII, p. 66, ♀.
Liojoppa lucida Heinrich, 1935, Mission Scientifique de l'Omo, III, p. 230, ♀♂. Kenya, Mt. Elgon 2400 m; description of ♂.

Types

Holotype.—♀, "Kilimandjaro, Sjöstedt 1905-6, Kibonoto, 1300-1900 m, 4. Mai." N.R.

Neallotype.—♂, "Kenya, Nairobi, 10.VI.32. leg. A. Seyrig." C.G.H. I.

Distribution

Northern Tanganyika: Kilimanjaro (type locality), Western Usambara Mts., Mt. Meru (C.G.H. II); Kenya: Mt. Elgon (C.G.H. I).

Preamble

I have treated the populations from the neighboring East African mountain massifs, the Mt. Kilimanjaro, Mt. Meru, Mt. Elgon and West Usambara Mts., as belonging to the nominate race *lucida lucida* Szépligeti, although I suppose that very subtle differences could be found between all of them if large enough series of specimens could be examined. So far I have seen only single specimens from all the localities mentioned, except the Western Usambara from where a broader series is at hand.

Female

Lemon-yellow; pronotum medially, mesoscutum and scutellum black, with the following yellow marks: two short median lines on mesoscutum,

prescutellar carinae, lateral bands on scutellum; propodeum yellow with black "leopard-skin" pattern; abdomen more or less extensively light orange-tinged toward apex; at least tarsi III and more or less intensively and extensively also tibiae III infuscated.

Flagellum.—With 36-38 segments, the first elongate, about 5 times as long as wide, the 11th square, the widest 1.5-2 times as wide as long. Black, apices of basal segments usually brownish; dorsal white annulus on segments 8-14 (Usambara Mts.), or 8-12 (Mt. Elgon), or 10-12 (Mt. Meru); scape ventrally yellow.

Head.—Carina genalis straight; carina oralis moderately strongly elevated. Lemon-yellow; the following black: middle of frons broadly down to antennal base, ocellar region and adjoining narrow median part of occiput behind ocelli, temple region from the occipital carina to the very border of eyes, posterior side of head behind carina occipitalis.

Thorax.—Lemon-yellow; the following black: median part of pronotum from one border of mesopleura to the other, mesoscutum, scutellum, usually patch below subalarum (not present in type), median marks on at least both areae dentiparae, area superomedia and area posteromedia, often also on anterior part of areae superoexternae, more rarely also on anterior part of areae spiraculiferae; mesoscutum with short yellow median lines; prescutellar carinae and broad lateral bands on scutellum and the postscutellum, yellow.

Legs.—Lemon-yellow; femora and tibiae I and II dorsally blackish-brown, the tarsi I and II slightly infuscated; femora III uniformly lemon-yellow, except usually the narrowly blackish tip; tarsi III blackish; tibiae III more or less extensively infuscated, either on base and apex or dorsally more or less intensely.

Abdomen.—Lemon-yellow; usually the third or fourth and following tergites slightly orange-tinted; postpetiole often medially with slightly infuscated patch.

Male

As female, except that tergites 5-7 and usually middle of fourth tergite are black; flagellum black, without annulus; tibiae and tarsi III entirely black; the black of the ocellar region extending usually laterally to the border of eyes, thus cutting off two yellow vertical marks from the yellow orbital bands which continue from frons to temples in females.

In one male out of 7 specimens from the Usambara Mts., basic color of mesoscutum blood-red.

1b. *Liojoppa lucida africana* (Morley), new combination

Lindigia africana Morley, 1915, Rev. Ichn. Brit. Mus., IV, p. 49, ♂.

Types

Holotype.—♂, "Entebbe, Uganda, 13.8.11, C.C. Goodey". B.M. No. 3b -134.

Distribution

Uganda, Entebbe.

Preamble

The only known specimen, the type, agrees so well with males of *lucida lucida* from Mt. Elgon and the Usambara Mts., that I was tempted to synonymize *africana* Morley with the latter. There are however, the following small differences which may turn out to be constant subspecific characters, paralleled perhaps by some others in the, still-unknown female. Therefore I have maintained Morley's name with subspecific status for the time being.

Male

Differs from lucida lucida *by having a black patch on the middle of face and another one on the middle of the postpetiole; apices only of tibiae III infuscated and also apices of femora III; otherwise as* lucida lucida.

1c. *Liojoppa lucida ulugurorum*, new subspecies

Types

Holotype.—♀, "Tanganyika, Uluguru Mts., 1500 m, 4.XII.1961." C.G.H. II.

Distribution

Eastern Tanganyika, Uluguru Mts.

Preamble

The Uluguru Mts. are zoogeographically particularly interesting. They are inhabited by several endemic species and subspecies of cloud-forest birds, which are quite different from their geographical forms from the Usambara Mts. and the Kilimanjaro massif. This subspecies of *Liojoppa* represents a parallel to the ornithological findings.

Female

Basic color of mesoscutum blood-red, of propodeum black, except metapleura, the areae of the black part outlined by narrow yellow bands; tibiae and tarsi III entirely black; length 10 mm.

Flagellum.—With 36 segments, segments 8-13 with dorsal white annulus.

1d. *Liojoppa lucida ufipae*, new subspecies

Types

Holotype.—♀, "Tanganyika, Ufipa Plateau, Mbesi Forest, 2500 m, Dec. 1962". C.G.H. II.

Distribution

Southwestern Tanganyika, Ufipa Plateau (type locality); Congo, region of Lake Kivu (C.M.).

Female

Mesoscutum blood-red, with short longitudinal ivory median lines; propodeum pale lemon-yellow without the black "leopard-skin" pattern of lucida lucida; *instead, areae of horizontal part medially light orange-tinged; tergites 1-4 pale lemon-yellow, 5-7 orange; infuscation on legs III*

restricted to the tarsi and the very base and apex of tibiae; legs II dorsally not, legs I scarcely, infuscated.

Flagellum.—With 35 segments, black, segments 8-14 with dorsal white annulus, basal segments apically brownish.

2. *Liojoppa occidentalis*, new species

Fig. 41

Types

Holotype.—♀, "Westafrika, Uelleburg, VI.-VIII.08. G. Tessmann S. G." Z.M.H.U.

Allotype.—♂, "Span. Guinea, Uelleburg, Benitogbt., 15.-21.I.07. G. Tessmann S. G." Z.M.H.U.

Paratypes.—6♂♂, 1 ♀, same locality, various dates. Z.M.H.U.; 3♂♂, 1 ♀, same locality, various dates. C.G.H. II.

Distribution

West Africa: Spanish Guinea.

Preamble

Differing strongly from the eastern mountain species *lucida* Szépligeti in both sexes by the structure of lower part of cheeks (fig. 41) (see below) and in the orange basic color of abdomen and legs; in females, besides, by lack of scopa on coxae III; in males by presence of black patches on the middle of at least the postpetiole, usually of tergites one to three or even to five.

Female

In dorsal view very much like lucida; *propodeum likewise yellow with black, blackish, or red "leopard-skin" pattern, mesoscutum likewise black with two yellow median lines which, however, often reach the anterior border of mesoscutum; abdomen orange, first segment basally and apically yellowish, medially sometimes blackish; flagellar structure and head color as in* lucida; *legs orange with some indistinct infuscations; length 10-12 mm.*

Flagellum.—Bristle-shaped, slender, distinctly flattened ventrally beyond middle and scarcely widened, moderately attenuated toward apex, with 35-37 segments, the basal segments elongate, the first about 4.5 times as long as wide, about the 14th square, the widest scarcely 1.5 times as wide as long. Black, with white annulus on segments 7 (apex) to 14 or 15; scape ventrally yellow.

Head.—Structure as described for the genus, except a strange specialization of lower part of genae (fig. 41): carina genalis near apex gradually curved forward, then, shortly before mandible base rather abruptly bent outward again, meeting the highly lamelliform carina oralis immediately below hind corner of mandibles in a sharp angle; space between lower part of carina genalis and oral lamella broadly concave with some strong, irregular rugosity. White; the following black: ocellar region and surroundings, middle of frons down to base of antennae, narrow median part of occiput behind ocelli, posterior part of head behind carina occipitalis, temple region from occipital carina close to eye border, or sometimes to the very border of eyes.

Thorax.—Structure as described for the genus. Yellow; the following black: at least a mark on pronotum behind collare or instead, a continuous median band on pronotum, basic color of mesoscutum and scutellum, mark on mesopleura below subalarum, median marks on areae dentiparae, area superomedia, and area posteromedia, sometimes also marks on areae superoexternae and areae spiraculiferae (the marks on areae of propodeum varying from blackish to reddish); mesoscutum with short yellow median marks which show a tendency to extend to the anterior border of mesoscutum; scutellum with wide, longitudinal, lateral yellow bands; prescutellar carinae and postscutellum yellow.

Legs.—Coxae III without scopa. Uniformly orange; coxae and trochanters I and II and inner side of tibiae I and II yellowish-tinged; there is sometimes a slight infuscation on dorsal side of anterior tibiae and tarsi and on the very apex of tibiae III.

Abdomen.—Structure as described for the genus. Almost uniformly ferruginous; first tergite basally and apically yellowish, sometimes medially blackish.

Male

Specialization of genal structure as in female; chromatically similar to female but more melanistic; pronotum black, except yellow base, ridge and collare; black mark on mesopleura extending backward to below speculum or even apex of mesopleura; black on frons, vertex and occiput more extensive than in female, the yellow on orbits interrupted on upper frons and on temples; middle of postpetiole more or less extensively black, usually also black patches on tergites 2 to 3 or even to 5; areae spiraculiferae, area posteromedia, and areae of horizontal part of propodeum predominantly black, surrounded by a network of yellow bands; flagellum without annulus; length 9-11 mm.

Flagellum.—With 34-37 segments and with elongate-oval tyloids on segments 10 or 11 to 17 or 18. Black, scape ventrally yellow.

3. *Liojoppa centralis*, new species

Types

Holotype.—♀, "Eala, VIII.1935. I. Gheskière". C.M.
Allotype.—♂, same locality and date. C.M.
Paratypes.—2 ♀♀, same locality. C.M.; 1 ♀, 1 ♂, same locality. C.G.H. II.

Distribution

Congo: Eala, near Coquilhatville (altitude about 300 m).

Preamble

This form has the same specialized structure of lower cheeks as *occidentalis* Heinrich and perhaps replaces the latter geographically. It differs, however, so distinctly in appearance from *occidentalis*, particularly in color, and also in larger size and more attenuated flagellum of females, that I am considering it as a species rather than as a subspecies. Predominantly pale lemon-yellow in both sexes, without black markings on abdomen; black on head and thorax more restricted than in *occidentalis*.

Female

Pale lemon-yellow; posterior tergites more or less extensively orange-tinged; mesoscutum black, with two long yellow median lines which always extend to its anterior border, scutellum yellow, with median longitudinal black band, sometimes entirely yellow; propodeum yellow, usually without black markings, sometimes areae dentiparae and area superomedia medially blackish-infuscated; flagellum black with dorsal white annulus; tarsi III, apex and very base of tibiae III infuscated; length 13-14 mm.

Flagellum.—Bristle-shaped, slender, distinctly flattened ventrally beyond middle and slightly widened, strongly attenuated toward apex, with 40 segments, the first about 5 times as long as wide, abouth the 17th square, the widest 1.5-2 times as wide as long, the last nine segments longer than wide. Black, with white annulus on segments 7 (apex) or 8 to 14; scape ventrally yellow.

Head.—Structure as in *occidentalis:* carina oralis highly lamelliform, carina genalis curved forward before apex then shortly before mandible base bent backward again, meeting the apex of the carina oralis in a sharply projecting angle below hind corner of mandible base. Yellow; black are: a large, median patch on vertex including the ocellar region and the broad middle of upper part of frons, a crossband on upper, posterior part of head below carina occipitalis, extending on both sides onto the temple region to about halfway to temple borders of eyes; vertical black patch and crossband from temple to temple may, or may not, be connected narrowly in the middle of occiput.

Thorax.—Structure as described for genus. Yellow; the following black: mesoscutum, usually a medially interrupted, narrow, transverse median band on pronotum, small mark on mesopleura below subalarum, median longitudinal band on scutellum; mesoscutum with long median longitudinal yellow bands extending to its anterior border; prescutellar carinae and postscutellum yellow; propodeum usually without the "leopard-skin" pattern; sometimes a blackish patch on area superomedia and on each side of horizontal part.

Legs.—Coxae III with indication of small scopa. Lemon-yellow; all femora apico-dorsally slightly orange-tinged, all tibiae dorsally slightly infuscated, tibiae III apically and basally narrowly blackish-brown-infuscated; tarsi III blackish.

Abdomen.—Pale lemon-yellow; usually the fourth tergite partially, the following tergites uniformly light-orange-tinged.

Male

General structure as in female; chromatically almost identical with female; black on head a trifle more extensive, but yellow vertical and temple orbits not fully interrupted by black; tibiae I and II dorsally usually infuscated; length 13-14 mm.

Flagellum.—Black. With small, short-oval tyloids on segments 11-19, the longest on segments 14-16 covering about the median half of segments.

4. *Liojoppa minor*, new species

Types

Holotype.—♀, "Angola, Quitondo, Distr. Calulo, 11.8.-2.9.1957." C.G.H. II.

Distribution

Angola, lower Cuanza River valley at Quitondo.

Preamble

A distinct, rather small species, with all characteristic features of the genus, except that the longitudinal striation on anterior tergites is not at all pronounced and restricted to the very middle, and that the carination and puncturation of the propodeum is rather normally developed; carina oralis and genalis normal, the former not lamelliform, the latter not curved apically; coxae III of females without scopa.

Female

Head, thorax, and coxae black with very rich white markings; mesoscutum with very short white median lines; lateral longitudinal white bands on scutellum; prescutellar carinae white; abdomen, femora, tibiae, and tarsi red; first tergite predominantly black, legs with some infuscations; flagellum black with dorsal white annulus; length 8 mm.

Flagellum.—(Apices lacking.) First segments about 4.5 times as long as wide, the 15th about square, the widest scarcely 1.5 times as wide as long. Black, with dorsal white annulus on segments 8-12; scape indistinctly whitish spotted below.

Head.—Structure and sculpture exactly as described for the genus; carina genalis straight, carina oralis not lamelliform. White and black; the following black: teeth of mandibles, apico-median dot on clypeus, malar space, apex of cheeks at mandible base broadly, a longitudinal band on each side of median field of face, posterior part of cheeks along carina genalis, temple region to the border of eyes on lower temples, occipital region, entire vertex from eye to eye including ocellar region, middle of frons broadly including entire antennal cavity, entire posterior side of head; frontal orbits thus broadly white up to level with lower ocellus; large white marks on temple orbits.

Thorax.—Structure as described for the genus; propodeum, however, not as if "sanded-down" as in type species, but rather densely and strongly punctured, the strongly elongate area centralis only being smooth and shiny, more than 3 times as long as medially wide, gradually narrowed toward apex and laterally distinctly carinate, except in anterior third of length. Black with very rich white markings; the following white: collare, pronotal ridge and base broadly, subalarum, two very short median lines on mesoscutum, prescutellar carinae, longitudinal, lateral bands on scutellum, postscutellum, longitudinal band on lower half of mesopleura which continues in front onto prepectus, prepectus medially on both sides of mesosulcus, large mark on metapleura, carinal triangle and adjacent, short band on outer part of areae superoexternae, W-pattern on apex of propodeum covering the apical carinae of areae dentiparae and projecting medially into the central area, marks on tegulae.

Legs.—Coxae III without scopa. Red; coxae black and white; white are: coxae I ventrally entirely, coxae II ventrally except base, coxae III dorsally extensively and ventrally at apex narrowly, trochanters I and II ventrally, tibiae I and II on interior side, apical part of femora I ventrally; the following infuscated: apex of femora III narrowly, of tibiae III broadly, the tarsi III, very base of tibiae III, tibiae and tarsi I and II indistinctly.

Abdomen.—Narrower than in *lucida* and *occidentalis:* second tergite distinctly longer than apically wide, the third and fourth scarcely 1.5 times as wide as long; tergites 1-3 medially longitudinally striate but not strongly and by far not so extensively as in the two species treated above, the fourth tergite indistinctly striate medially only at the very base; gastrocoeli as described for the genus. Red; first tergite black, except latero-apically; an infuscated mark medio-basally on the third tergite.

17. Genus *Liojoppites,* new genus

Type species.—*Liojoppites poecilipictus,* new species

Distribution

Eastern Cape Province.

Preamble

Closely related to *Liojoppa* Szépligeti by the structure of propodeum, the very short and wide mandibles with subequal, long, gaping teeth, by the extremely strong aciculation of anterior tergites and large and deep gastrocoeli, the obsolete notauli and by the hidden labrum. Differs mainly by the structure of scutellum which is not, as so typical for *Liojoppa,* flat and depressed, but distinctly, though not strongly, elevated and laterally carinate. Furthermore the head is less strongly built than in *Liojoppa* and the abdomen is more elongate.

Morphological characters

Flagellum.—Of males with a row of narrow, oval tyloids, the longest covering about median half of segments; slightly nodose by transverse bristle-ridges on ventral side.

Head.—By far not as strongly built as in *Liojoppa:* temple profile distinctly narrowed behind eyes; cheeks in lateral view moderately wide and swollen; clypeus and face not clearly separated, as also in *Liojoppa;* lateral corners of clypeus, however, more distinct; median field of face as in *Liojoppa* very slightly elevated; labrum hidden; mandibles as described in preamble.

Thorax.—Mesoscutum medially somewhat longer than wide, polished; notauli obsolete; scutellum moderately raised above postscutellum, dorsally slightly convex, laterally weakly carinate; propodeum short, contiguous to postscutellum, declivous from base to apex in one continuous, slightly curved slope, similar to *Liojoppa,* but carination rather complete, though not very prominent; only areae coxales and anterior border of area superomedia obsolete; area posteromedia distinctly longer than horizontal part medially.

Legs.—Fairly slender.

Wings.—Clear; areolet quadrangular.

Abdomen.—Tergites 1-3 medially extensively and very strongly longitudinally striate; gastrocoeli large and deep, with narrow interval; hypopygium of males apically obtuse.

1. *Liojoppites poecilipictus*, new species

Types

Holotype.—♂, "Northern Cape Province, King Williamstown, Peeree Forest, 5.III.63." C.G.H. II.

Distribution

Eastern Cape Province.

Male

Head white with black and red dorsal markings; thorax ventrally white, dorsally black with very rich white markings; mesoscutum predominantly blood-red; scutellum laterally white, mesoscutum with white median and lateral lines; abdomen light brown with some black markings; legs extensively brown with dark markings, anterior coxae white; flagellum black with white annulus; length 13 mm.

Flagellum.—With 39 segments and with short, narrow tyloids on segments 11-20. Black, with dorsal white annulus on segments 16-20, ventrally brownish; scape ventrally white.

Head.—Temples distinctly narrowed behind eyes, with slightly curved outline; frons even, not concave; occiput but slightly emarginate; cheeks, in lateral view, moderately wide and swollen; face and clypeus shiny, with very sparse, fine punctures; frons without puncturation, shiny. White; middle of frons extensively brownish-red; the following black: antennal cavity, ocellar, occipital and temple regions, the black color of the latter not quite reaching the margins of eyes; apex of cheeks at mandible base narrowly black.

Thorax.—Structure as described for genus. The following white: sterna and prepectus uniformly, mesopleura and metapleura predominantly, collare, pronotal ridge and base broadly, inferior apical part of propleura, subalarum, dot on tegulae, fairly long longitudinal median and short lateral lines on mesoscutum, prescutellar carinae, sides of scutellum, postscutellum, propodeum extensively, except black parts listed below; the following black: rest of pronotum, medio-apical patch on mesoscutum and its exterior sutures, median part of scutellum, diagonal band on mesopleura extending from anterior upper corner to about middle of apical border, longitudinal band on metapleura following inferior side of carina metapleuralis, areae superoexternae, dentiparae, and posteromedia, lateral slopes of scutella; basic color of mesoscutum blood-red.

Legs.—Predominantly light brown, coxae III and all trochanters dorsally blackish; tarsi II and III distinctly, dorsal side of femora slightly infuscated; coxae I and II and ventral side of trochanters I and II white.

Abdomen.—Light brown, first tergite with narrow whitish apical band; the following blackish: first tergite except more than apical half of postpetiole, base of second tergite beyond gastrocoeli, indistinct, smallish patch on base of third tergite.

18. Genus *Pseudocoelichneumon*, new genus

Type species.—*Pseudocoelichneumon gracilipictor*, new species.

Distribution

Eastern Cape Province

Preamble

The type species agrees in most structural characters with the Holarctic genus *Coelichneumon* Thomson, but differs in the propodeum which is anteriorly contiguous to postscutellum, the basal furrow being obsolete; it slants down from the postscutellum in a gradual, even curve as in the genus *Liojoppa* Szépligeti. Differs from *Liojoppa* by normal, long and fairly slender mandibles with long and narrow apical and much shorter, small, subapical tooth, both separated from each other by a small gap.

Morphological characters

Flagellum.—Of females bristle-shaped, moderately long, with elongate, slender, basal segments, ventrally flattened and slightly widened beyond middle, moderately attenuated toward apex.

Head.—Temple profile distinctly narrowed behind eyes, with nearly straight outline; cheeks in lateral view not wide and not swollen; median field of face slightly convex, distinctly separated from clypeus, the latter normal, with minute medio-apical projection and indication of basal convexity; mandibles as described in preamble.

Thorax.—Mesoscutum medially somewhat longer than wide, very finely sculptured, shiny; notauli completely obsolete; scutellum dorsally nearly flat, laterally not at all carinate, with straight sides, converging to postscutellum, apically truncate, not raised above postscutellum; propodeum as described in preamble; carination described below for type species.

Legs.—Fairly short.

Wings.—Clear; areolet quadrangular.

Abdomen.—Of females pronounced oxypygous, ovipositor distinctly projecting; tergites 2-4 strongly sclerotized and separated from each other by deep sutures; middle of tergites 1-4 strongly longitudinally striate; gastrocoeli large and deep, transverse-triangular.

1. *Pseudocoelichneumon gracilipictor*, new species

Types

Holotype.—♀, "Cape Province, Grahamstown, Governors Kop." C.G.H. II.

Distribution

South Africa, eastern Cape Province.

Female

Red-brown; head, thorax, and coxae extensively ivory-marked; prescutellar carinae, median and lateral lines on mesoscutum and lateral lines on scutellum ivory; middle of tergites 1-4 strongly longitudinally striate, mesoscutum polished; length 11 mm.

Flagellum.—Bristle-shaped, moderately long, scarcely widened beyond middle and not strongly attenuated, with 35 segments, the basal segments long and slender, the first about 4 times as long as wide, the 10th approximately square, the widest scarcely twice as wide as long. Blackish, segments 10-15 with dorsal white annulus; scape red-brown, ventro-apically ivory.

Head.—Temple and cheek profiles rather strongly narrowed, the former with slightly curved outline; malar space slightly longer than half the width of mandible base; apical border of clypeus straight with median tubercle, smooth and shiny. Redbrown; the following ivory: mandibles except apex, clypeus, two median dots on upper border of face, orbits broadly around eyes, very narrowly interrupted on vertex, narrowly on malar space, widened over most of lower part of cheeks.

Thorax.—Mesoscutum somewhat longer than wide, polished; notauli obsolete; scutellum moderately convex, polished, not carinate; propodeum punctured, area superomedia polished, elongate, semioval, narrowed toward area basalis, anteriorly not carinate; space of area basalis smooth, not limited by carinae; carinae dentiparae exteriores subobsolete; areae coxales distinct. Red-brown; the following ivory: collare, pronotal ridge and base, subalarum, mark on upper posterior part of mesopleura, continuous crossband of equal width on lower part of mesopleura, crossband on ventral part of prepectus, lateral marks on prepectus, two longer median and two short lateral lines on mesoscutum, prescutellar carinae, lateral margin of scutellum, postscutellum except medially, carinal triangle, mark on apical part of metapleuron, band along carinae dentiparae interiores, marks on both sides of apex of mesosulcus; the following blackish: middle of prepectus, scutellum predominantly, patch on mesopleura below subalarum, apex of propodeum.

Legs.—Moderately stout; no scopa; coxae III finely and rather densely punctured. Red-brown; the following ivory: coxae I predominantly, dorsal marks on coxae II and III, trochanters I and II ventrally except base, tibiae I and II ventrally; apex of femora III dorsally, and apex of tibiae and tarsi III indistinctly infuscated.

Abdomen.—Median field of postpetiole prominent, strongly striate, as are tergites 2-4 medially; gastrocoeli large and deep, each about as wide as the space between; tergites sharply separated. Uniformly red-brown.

19. Genus *Corymbichneumon* Morley

Corymbichneumon Morley, 1919, Proc. Zool. Soc. London, p. 136.

Type species.—*Corymbichneumon carinifer* Morley, monobasic.

Distribution

High-mountain cloud forest of Kenya, Nyasaland, and Tanganyika; one record from Natal.

Preamble

The peculiar structure of the propodeum displayed by the type species is not only characteristic for this genus, but also for *Genaemirum* Heinrich and *Afrocoelichneumon* Heinrich. The latter genus is so closely related to *Corymbichneumon* that the separation of the two seems to be arbitrary.

They differ mainly in scutellar structure; this difference, however, is based on structural principle rather than on mere degree of specialization and there are no real intermediates between the two groups. Furthermore the *Corymbichneumon* forms are evidently all inhabitants of high-mountain cloud forests, whereas *Afrocoelichneumon* occurs at lower elevations. This coincidence of a differing biological and structural character has caused me to maintain the separation of the two genera mentioned.

Scutellum without trace of lateral carinae, strongly subglobularly elevated in females, subpyramidal, with bluntly rounded summit in males; propodeum strongly curved down backwards, the areae dentiparae almost reaching to the base of coxae III; area superomedia and area basalis united, forming one large, rather smooth, nearly parallel-sided central area which reaches the postscutellum with the median part of its anterior border. The transverse basal furrow of the propodeum, so well-developed in *Coelichneumon* Thomson and *Musakia* Strand, thus is obsolete. Cheeks and temples more narrowed than in *Afrocoelichneumon,* flagellum of females slenderer, pronotal ridge not at all widened or swollen.

Basic color black and/or chestnut brown; scutellum and usually median mark on mesoscutum, yellow.

Morphological characters

Flagellum.—Of females bristle-shaped, slender, not at all widened beyond middle, with elongate basal segments; of males with row of elongate-oval tyloids, slightly nodose by transverse bristle-ridges on ventral side of segments.

Head.—Normal, temple and cheek profiles distinctly narrowed, with straight outlines; clypeus flat, with straight apical border; mandibels normal, upper tooth somewhat longer than lower, the two not separated by a wide gap.

Thorax.—Mesoscutum moderately convex, somewhat longer than wide; anterior fourth of notauli sharply impressed; pronotal ridge very narrow, not the least widened or swollen; mesopleura on lowest, anterior part with a slight longitudinal depression (indistinct in males); scutellum not at all laterally carinate, strongly convex and smooth, in females approximately subglobular, in males approaching more a subpyramidal or conical shape, with bluntly rounded summit; area basalis and area superomedia united, forming a large, nearly parallel-sided central area, apically not separated by a clear carina from the area posteromedia and reaching the postscutellum anteriorly with its median part; this central area is usually smooth, coarsely rugose only apically; areae posteroexternae and area posteromedia not separated from each other.

Legs.—Rather long and slender; femora much slenderer than in *Afrocoelichneumon.*

Wings.—Areolet narrowed anteriorly, but not as strongly as in *Afrocoelichneumon,* distinctly pentagonal.

Abdomen.—Of females oxypygous, generally shaped as in *Coelichneumon;* postpetiole with distinct median field which is densely and strongly punctate, the punctures partially running into longitudinal rugae; gastro-

coeli fairly large and deep, with distinct thyridia; middle of second, and sometimes, third tergite more or less distinctly striate; hypopygium of males sharply triangularly projecting.

Key to the species and subspecies of *Corymbichneumon* Morley

Females

1. Mesoscutum and scutella uniformly yellow. (Chestnut-red; mesosternum black from mesosulcus to sternauli; upper half of propleura yellow; length 16 mm.) ..... 1. *carinifer* Morley
   Nyasaland, Mlanje Plateau
   Mesoscutum black or red, with or without yellow apico-median mark; scutella always yellow. 2
2. Head and thorax red, mesosternum black from mesosolcus to sternauli. (Yellow apico-median mark on mesoscutum; abdomen uniformly red; mesoscutum more distinctly punctured than in following forms; length 16 mm.) ..... 2f. *connexius njombicus*, new subspecies
   South Tanganyika, Livingstone Mts.
   Head and thorax entirely or predominantly black. 3
3. Abdomen black or brownish-black. (Yellow apico-median mark on mesoscutum, yellow band on propleura.) 4
   Abdomen, or at least tergites 2—7, chestnut-red. 5
4. Head uniformly jet-black, except narrowly yellow frontal orbits. (Abdomen and legs uniformly jet-black; length 14—17 mm.) ..... 2c. *connexius meruensis*, new subspecies
   North Tanganyika, Mt. Meru
   Head uniformly jet-black; besides frontal orbits also face and cheeks lighter colored. (Length 14 mm.) ..... 2a. *connexius connexius* (Morley)
   Natal
5. Mesopleura and metapleura uniformly black. (Legs III uniformly black in both sexes; in female mesoscutum and pronotum without yellow marks, in male only mesoscutum without yellow mark; length 16.5 mm.) ..... 2d. *connexius uluguricus*, new subspecies
   East Tanganyika, Uluguru Mts.
   Mesopleura and metapleura extensively red. 6
6. Legs III and first segment of abdomen black; mesoscutum with yellow apico-median mark. Legs I and II ventrally extensively red; length 15 mm.) ..... 2b. *connexius jeaneli* (Heinrich)
   Kenya, Mt. Elgon
   Legs III extensively and first segment of abdomen entirely red; mesoscutum in female without yellow apico-median mark. (Length 16 mm.) ..... 2c. *connexius usambarae*, new subspecies
   North Tanganyika, West Usambara Mts.

1. *Corymbichneumon carinifer* Morley

Corymbichneumon carinifer Morley, 1919, Proc. Zool. Soc. London, pp. 136-137, ♀.

Types

Holotype.—♀, "Nyasaland, Mlanje Plateau, 8500 ft., 10.XI.13, S.H. Neave." B.M. No. 3b-69.

Distribution

Nyasaland, at about 2800 m altitude.

Preamble

This is the only known species of this genus with uniformly yellow mesoscutum.

Female

Chestnut-red; the following yellow: entire mesoscutum, scutella, upper half of propleura, mark on subalarum; mesosternum black from middle to sternauli; blackish are furthermore: legs I and II including trochanters, apex of femora III, the tibiae and tarsi III; length 14-18 mm.

Flagellum.—Long, slender, not at all widened, with 47 segments, the first nearly 4 times as long as wide, about the 10th square. Black, with white annulus on segments 10-19.

Thorax.—Central area of propodeum longitudinally rugose in type specimen.

2. *Corymbichneumon connexius* (Morley)

Distribution

Natal (type locality) and high altitudes of East Africa in Kenya and Tanganyika.

Preamble

This species inhabits the isolated patches of cloud forest on probably all the high mountains of tropical East Africa and has developed many isolated subspecies, differing mainly in the distribution of black and chestnut-red coloration and also in the presence or partial absence of certain characteristic yellow marks . Unfortunately, the typical color of the subspecies *connexius* from Natal can not be stated with certainity, as the type specimen is now (and evidently was already at description) badly discolored. This makes a chromatic diagnosis of the South African subspecies hypothetical until fresh material from the type locality is found. The species was found to be rare at all recorded localities.

Female

Basic color of body and legs varying geographically between chestnut-red and black; bright yellow are: the scutella always, and usually the frontal orbits narrowly, upper half of propleura together with pronotal ridge and large median mark on mesoscutum in front of scutellum; the central yellow mark on mesoscutum and/or the yellow band on propleura may be absent in some subspecies; flagellum black with white annulus; length 14-17 mm.

Thorax.—Sculpture of mesoscutum always fine, but varying geographically between (at 60-times magnification) distinct and fairly dense punctation and extremely fine, subglabrous sculpture.

Male

Only two have been found so far. *Basic color seemingly geographically differing parallel to the female, but the yellow marks on pronotum and mesoscutum in both specimens sexually dichromatic (sometimes present in males where absent in females); head, anterior coxae, and sterna richly white-marked; flagellum black, without annulus, with elongate tyloids on segments 10 or 11 to 19; length 16 mm.*

2a. *Corymbichneumon connexius connexius* (Morley), new combination

Eupalamus connexius Morley, 1916, Ann. South Afr. Mus., XV, p. 362, ♀.

Types

Holotype.—♀, "Natal, Bulwer, 1914, W. Haygarth". S.A.M.

Distribution

Natal (type locality).

Preamble

Most of the parts recorded in the original description as "sanguineous red" are quite obviously discolored, probably through application of cyanide for killing. These parts will be assumed to have been bright yellow in nature, as they are in fresh specimens from other localities. The general color is given by Morley as "dull black", whereas at present, most parts of the type specimen are red-brown. This may well be the result of fading by exposure to sunlight, as often noticable in old specimens. But there is no way of finding the truth, except by collecting a new specimen.

Female

Either mainly dull black, or dark red-brown; the following were probably bright lemon-yellow: upper half of propleura, together with pronotal ridge, large median mark on mesoscutum before basal furrow of scutellum, scutella, mark on subalarum, and frontal orbits; cheeks and face are now pale ferruginous, they certainly were not yellow in nature like the other parts, but they may have been lighter-colored than the rest of the body; length 14 mm.

Flagellum.—With 47 segments, the first nearly 4 times as long as wide, about the 10th square, none wider than long. With white annulus on segments 10-19.

2b. *Corymbichneumon connexius jeaneli* (Heinrich), new combination

Afrocoelichneumon Jeaneli Heinrich, 1935, Mission Scientifique de l'Omo, III, pp. 228/29, ♀.

Types

Holotype.—♀, "Kenya, Mt. Elgon vers l'Est, 2400 m, Guam fishing hut." M.N.H.N.

Distribution

Kenya, Mt. Elgon, at 2400 m.

Female

Basic color of head, thorax, legs, and the first tergite black or blackish; the following chestnut-red: mesopleura medially and apically, metapleura (except areae coxales), legs I and II ventrally extensively and tergites 2-7; bright yellow are: upper half of mesopleura with pronotal ridge, large, nearly quadrangular mark on apical half of median lobe of mesoscutum, subalarum, scutella, frontal orbits indistinctly; length 15 mm.

Flagellum.—With 44 segments, first segment about 3 times as long as wide, the 13th approximately square. With white annulus on segments 11-20.

Thorax.—Mesoscutum very finely punctured, somewhat shiny; mesopleura and metapleura very densely punctured, subopaque; propodeum rugose-punctate, except area centralis smooth.

Abdomen.—Second and third tergites medially distinctly striate.

2c. *Corymbichneumon connexius usambarae*, new subspecies

Types

Holotype.—♀, "Tanganyika, Western Usambara Mts., 2100 m, 21.III. 1962." C.G.H. II.

Allotype.—♂, same locality and date. C.G.H. II.

Distribution

Northern Tanganyika, Western Usambara Mts., at 2400 m.

Preamble

Agrees with subspecies *jeaneli* from Mt. Elgon in black basic color of head and thorax, combined with extensively red mesopleura and metapleura; differs from *jeaneli* by lack of the yellow mark on mesoscutum in the female and by predominantly red legs III in both sexes.

Female

Basic color of head and thorax black; the following chestnut-red: mesopleura medially and apically, metapleura (including areae coxales), legs III predominantly, coxae III and abdomen uniformly; legs I and II uniformly black, including coxae; bright yellow are: upper third of propleura with pronotal ridge, and scutella; lenght 16 mm.

Flagellum.—With 47 segments, the first about 3.5 times as long as wide, the 10th approximately square, none wider than long. Black, segments 11-19 with full white annulus.

Head.—Black; frontal orbits narrowly yellowish.

Thorax.—Mesoscutum very finely and moderately densely punctured, somewhat shiny; scutellum subglobular, smooth and shiny; central area of propodeum, except smooth median part of anterior half, longitudinally rugose.

Legs.—Legs I and II uniformly black, including coxae; legs III predominantly, coxae III uniformly red; black are: apical half of femora III dorsally, the very base of tibiae III and their apices broadly, tarsi III.

Abdomen.—Middle of second tergite distinctly, of third less distinctly, longitudinally striate. Uniformly chestnut-red.

Male

Pleura, legs III, and abdomen as in female; in contrast to female mesoscutum with large yellow median mark, and sterna and legs I and II extensively white; flagellum black, without annulus; length 16 mm.

Flagellum.—With 46 segments and with elongate, oval tyloids on segments 11-18. Black, without annulus; scape ventrally white.

Head.—Black; the following white: mandibles except teeth, clypeus, face, frontal orbits up to lower ocellus, outer orbits from temple region down to ends of eyes, leaving the malar space and apex of cheeks near mandible base black.

Thorax.—Scutellum almost pyramidal, with blunted summit. Black; lemon-yellow are: upper half of propleura with pronotal ridge, subalarum, rounded mark on posterior part of median lobe of mesoscutum, scutella; the following red: middle and apex of mesopleura extensively, metapleura entirely; the following white: prosternum except base, exterior parts of prepectus, mesosternum except apex, the latter more extensively black laterally than in the middle near mesosulcus.

Legs.—Legs III predominantly red, with black markings as in female, coxae III entirely red; coxae I and II almost entirely white; white are furthermore: inner sides of femora and tibiae I and II and ventral side of trochanters I and II; rest of legs I and II black.

Abdomen.—Uniformly chestnut-red.

2d. *Corymbichneumon connexius ulugurícus*, new subspecies

Types

Holotype.—♀, "Tanganyika, Uluguru Mts., 1600 m, 13.XII.1961." C.G.H. II.

Allotype.—♂, same locality, 1500 m, 30.XI.1961. C.G.H. II.

Distribution

Eastern Tanganyika, Uluguru Mts., at 1500-1600 m.

Preamble

Differs from subspecies *usambarae* and *jeaneli* by uniformly black thorax, including pleura, and by lack of yellow median mark on mesoscutum in both sexes, also by lack of yellow band on propleura in female; differs from *usambarae* also by uniformly black legs III and black first tergite in both sexes. Mesoscutum extremely finely punctured.

Female

Head, thorax, legs, and first tergite black, without red marks; only scutella and mark on subalarum yellow; tergites 2-7 chestnut-red; length 16.5 mm.

Flagellum.—With 44 segments. Black, with white annulus on segments 10-21. Proportions as in *usambarae.*

Head.—Including frontal orbits uniformly black.

Thorax.—Sculpture of mesoscutum finer than in all other subspecies, extremely finely punctured, nearly smooth. Black, with yellow mark on subalarum and yellow scutella.

Legs.—Uniformly black.

Wings.—Very slightly infuscated.

Abdomen.—Longitudinal striation on middle of second and third tergites rather indistinct. Chestnut-red, except black first segment.

Male

Head and thorax black, with white and yellow marks, exactly as in subspecies usambarae, *except for the yellow median mark on mesoscutum which is lacking; pleura and legs III including coxae in contrast to* usambarae *uniformly black; abdomen chestnut-red, except first tergite black; legs I and II as in* usambarae; *length 15.5 mm.*

Flagellum.—With 44 segments and with elongate-oval tyloids on segments 10-19. Black, including scape, the latter ventrally white.

2e. *Corymbichneumon connexius meruensis*, new subspecies

Types

Holotype.—♀, "Tanganyika, Mt. Meru, 2700 m, 10.-17.VII.1962, B. Heinrich." C.G.H. II.

Paratypes.—6 ♀♀, same locality and date. C.G.H. II.

Distribution

Northern Tanganyika, Mt. Meru, at 2750 m.

Preamble

Differs from all other subspecies by the uniformly jet-black basic color of entire body, including legs; very constant in color pattern.

Female

Uniformly jet-black; lemon-yellow are: frontal orbits narrowly, about upper half of propleura with pronotal ridge, mark on subalarum, scutella, and large, approximately quadrangular mark on apex of median lobe of mesoscutum (this mark projecting triangularly in front); apical border of trochanters I white; length 14-17 mm.

Flagellum.—With 44-45 segments, the first about 3 times as long as wide, the 10th approximately square, none wider than long. Black, segments 10 (usually apex) to 18 or 19 with complete white annulus.

Head.—Black, frontal orbits narrowly yellow; in one specimen indistinct yellow markings also on vertical and temple orbits of eyes.

Thorax.—Mesoscutum sparsely and finely, but fairly distinctly punctured and distinctly shiny; scutellum not quite as elevated as in subspecies *usambarae* and *ulugurícus*, polished. Black; lemon-yellow are: upper half of propleura and pronotal ridge, mark on subalarum, scutella, large mark on apex of median lobe of mesoscutum.

Legs.—Uniformly black, only apical band on trochanters I white.

Abdomen.—Middle of second and third tergites distinctly striate. Uniformly jet-black.

2f. *Corymbichneumon connexius njombicus*, new subspecies

Types

Holotype.—♀, "Southern Tanganyika, Mdando Forest, 30 mi. south of Njombe, 2400 m, 18.X.1962." C.G.H. II.

Distribution

Southern Tanganyika, Livingstone Mts., at 2400 m.

Preamble

Differs from all other subspecies by the red basic color of head and thorax.

Female

Basic color of head and thorax and entire abdomen red; legs III predominantly, legs I and II partially, red; bright yellow are: upper half of

propleura with pronotal ridge, subalarum, scutella, large, approximately quadrangular mark on apex of median lobe of mesoscutum, frontal orbits narrowly; length 16 mm.

Flagellum.—With 46 segments, the first fully 3 times as long as wide, the 10th approximately square, none wider than long. Segments 10 (apex) to 19 with complete white annulus.

Head.—Chestnut-red, ocellar region blackish, upper part of frontal orbits yellow.

Thorax.—Mesoscutum more distinctly and densely punctured than in subspecies b.-e., the scutellum somewhat less elevated, not quite subglobular. Chestnut-red; lateral lobes of mesoscutum apically infuscated, mesosternum from middle to sternauli black; lemon-yellow are: upper half of propleura with pronotal ridge, subalarum, scutella and large, about quadrangular mark on apex of median lobe of mesoscutum.

Legs.—Legs I and II black to blackish; anterior side of femora I and the coxae I extensively reddish, of tibiae I yellowish; coxae II predominantly red, inner side of femora II and of tibiae II red; legs III predominantly, coxae III entirely red; black are: trochanters III extensively, femora III dorso-apically, tarsi III entirely, base of tibiae III narrowly, and their apices extensively.

Abdomen.—Longitudinal striation on middle of second and third tergites distinct. Uniformly chestnut-red.

20. Genus *Afrocoelichneumon* Heinrich

Fig. 40

Afrocoelichneumon Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 28 and pl. V, fig. 32 (propodeum).

Type species.—*Ichneumon malagassus* Saussure, original designation.

Distribution

The genus is doubtless distributed over the whole of Africa south of the Sahara, but so far we have records only from all the eastern parts of the continent: from Abyssinia south to Cape Province and Madagascar; the first record for West Africa (Angola) is added in this paper.

Preamble

By the shape of propodeum, particularly of its central area (fig. 40), fairly closely related to *Corymbichneumon* Morley; most readily distinguished from the latter by the structure of scutellum, which is not subglobular in females or subpyramidal in males, but of normal shape and height, with scarcely to moderately convex surface, and which displays in several species a tendency to develop lateral carinae rather than greater elevation. The species attributed to this genus differ distinctly, in general, from *Corymbichneumon* in appearance by stouter build, particularly by stouter legs and by thicker head. The united areae superomedia and basalis (usually referred to in this paper as *central area)* is apically more or less clearly separated from the area posteromedia, in contrast to *Corymbichneumon,* and the slight longitudinal impression on the lowest anterior part of mesopleura, visible in *Corymbichneumon,* is lacking. The areolet in the forewing is, in contrast to *Corymbichneumon,* quadrangular, or al-

most so. Chromatically this group is distinguished by frequent occurence of white abdominal markings, either anal marks or apico-lateral marks on anterior tergites and richer white and yellow marks on head and thorax. No *Afrocoelichneumon* has been found so far in the high altitudes where the *Corymbichneumon* species occur.

Morphological characters

Flagellum.—Of females bristle-shaped, ranging from rather stout to slender, sometimes distinctly widened beyond middle; of males with row of bacilliform to elongate-oval tyloids, slightly nodose by transverse bristle-ridges on ventral sides of segments.

Head.—Normal, temple and cheek profiles rarely strongly narrowed, usually rather wide and with curved outlines; clypeus flat, with nearly straight apical border, medio-apically almost always a trifle projecting; mandibles normal, upper tooth somewhat longer than subapical, the two not separated by a wide gap.

Thorax.—Mesoscutum moderately convex, somewhat longer than wide; anterior fourth of notauli distinct; pronotal ridge and subalarum not quite as narrow as in *Corymbichneumon,* but more or less distinctly swollen or widened; no trace of longitudinal depression on the lowest anterior part of mesopleura; scutellum flat to moderately convex, in type species and most others laterally carinate at base only, in some species included below in this genus strongly carinate in whole length; as in *Corymbichneumon,* areae basalis and superomedia united, forming a large central area (fig. 40) which may be almost parallel-sided or somewhat narrowed toward base of propodeum and which reaches the postscutellum anteriorly with its median part; central area separated from the area posteromedia by a distinct carina; areae posteroexternae and area posteromedia not separated from each other.

Legs.—Of medium length, femora usually stout and rather thick; coxae III of females sometimes with scopa.

Wings.—Areolet not distinctly pentagonal, usually quadrangular, or almost so.

Abdomen.—Of females oxypygous, generally shaped as in *Coelichneumon;* postpetiole with distinct median field which is densely and strongly punctured; gastrocoeli fairly large and deep, with distinct thyridia; middle of second and third tergites not longitudinally striate, except sometimes space between gastrocoeli; hypopygium of males triangularly projecting.

Key to the species and subspecies of *Afrocoelichneumon* Heinrich

a. Females

1. Scutellum not carinate, except sometimes at the very base. 2
   Scutellum carinate to about middle, sometimes beyond. 8
2. Abdomen uniformly or predominantly red or black, without white marks. 3
   Abdomen with white anal marks and/or apico-lateral marks on anterior tergites. 6
3. Abdomen uniformly or predominantly black; no scopa. (Mesoscutum with white median mark; flagellum without white annulus; length 18 mm.) ..... 3. *noerus* (Tosquinet)
   Abyssinia

Abdomen uniformly ferruginous; coxae III with scopa. (Mesoscutum with white median mark.) 4

4. Mesoscutum black; flagellum with 40-44 segments, the widest twice as wide as long; larger species, 13-18 mm long. ..... 1. *malagassus* (Saussure) Madagascar

Mesoscutum red; flagellum with 37 segments, the widest scarcely wider than long; smaller species, 12-14 mm long. 5

5. Pronotum, prepectus, mesopleura, and middle of mesosternum with black markings; tibiae II and III not infuscated, all coxae white-marked. (Length 12 mm.) ..... 2b. *rubidus scopulifer* (Morley) Nyasaland

Thorax without black marks; tibiae II and III infuscated; coxae not white-marked. (Length 14 mm.) ..... 2a. *rubidus rubidus* (Tosquinet) Cape Province

6. Abdomen light red, only basic color of tergites 5-7 extensively black; no white apico-lateral marks, or apical bands on anterior tergites. (Tergites 6 and 7 with white anal marks; length 13 mm.) ..... 4. *subflavus* Heinrich Madagascar

Abdomen predominantly or entirely black; white apico-lateral marks or apical bands on anterior tergites. 7

7. Apex of abdomen oxypygous; gastrocoeli fairly large and deep; wings not infuscated. (Tergites 6 and 7 with white anal marks; basic color of entire abdomen black; length 12-18 mm.) ..... 8. *pulcher* (Morley) Eastern South Africa, S. Rhodesia

Apex of abdomen semiamblypygous; gastrocoeli small and shallow; wings usually infuscated. ..... see *Aethiamblys*, new genus

8. Lateral areae of horizontal part of propodeum black, central area pale reddish; legs III without infuscation. (Sterna and metapleura without black markings; white orbits interrupted on temples; length 17 mm.) ..... 5b. *cornelliger angolicus*, new subspecies Angola

Horizontal part of propodeum chestnut-red; tibiae and tarsi III infuscated. 9

9. Mesosternum and areae coxales extensively black; white orbits broadly interrupted on temples. (Length 16 mm.) ..... 5c. *cornelliger tanganyikae*, new subspecies Tanganyika

Mesosternum and areae coxales red; white orbits not interrupted on temples. ..... 5a. *cornelliger cornelliger* (Morley) Nyasaland

b. Males

1. Scutellum not laterally carinate except sometimes at the very base. 2

Scutellum laterally carinate to about middle or sometimes beyond. (Mesoscutum with white median mark; scutella white; tergite 1 or 1 and 2 with white apico-lateral marks; length 13-16 mm.) 8

2. Abdomen without white marks, uniformly red or black or red and black combined. 3

Abdomen with white anal marks and or white apico-lateral marks on anterior tergites. 5

3. Abdomen entirely or predominantly black. (Mesoscutum with white median mark; length 18 mm.) ..... 3. *noerus* (Tosquinet) Abyssinia

Abdomen uniformly or extensively red. (Mesoscutum with white median mark.) 4

4. Mesoscutum black; mesosternum almost entirely white; abdomen uniformly red. (Length 15 mm.) ..... 1. *malagassus* (Saussure) Madagascar

Mesoscutum red; mesosternum black; abdomen black toward apex. (Length 12-14 mm.) ..... 2a. *rubidus rubidus* (Tosquinet) Cape Province

5. Flagellum with annulus; abdomen only with one anal mark and without apico-lateral marks on anterior tergites. (Abdomen light red, basic color of last

tergite black; mesoscutum with white median mark; length 13 mm.) ..... 4. *subflavus* Heinrich Madagascar

Flagellum without annulus; abdomen with white apico-lateral marks, or apical bands, on anterior tergites. (Sometimes also anal mark present.) 6

6. Gastrocoeli rather deep and large with pronounced thyridia; mesoscutum black, with rounded white median mark; wings not infuscated. (Anterior tergites with white latero-apical marks, last tergite with anal mark; mesopleura and sometimes metapleura red; length 13-16 mm.) 7

Gastrocoeli small and shallow, thyridia narrow or indistinct; mesoscutum usually more or less extensively ferruginous, with or without median mark; wings usually infuscated. (Anterior tergites with latero-apical marks or even with apical bands; last tergites usually without anal marks.) ..... see *Aethiamblys*, new genus

7. Basic color of tergites 2-7 light red; tergites 1-4 with laterally widened white apical bands; coxae III dorsally white-marked; pronotal base white; all femora and tibiae red. ..... 7. *didymatus* (Morley) Nyasaland

Base of abdomen usually more extensively infuscated; tergites 2 to 3 or 4, rarely 1-4, with small latero-apical white marks; coxae III dorsally not white-marked; pronotal base black; legs III usually predominantly black, rarely red. ..... 6. *natalensis* (Cameron) Natal, Zululand, Basutoland

8. Basic color of thorax, first tergite and coxae III black; femora and tibia III infuscated only at the very apices. ..... 5b. *cornelliger angolicus*, new subspecies Northwestern Angola

Propleura, mesopleura, metapleura, coxae III, and first tergite predominantly red; apices of femora III broadly and the entire tarsi III blackish-infuscated. ..... 5c. *cornelliger tanganyikae*, new subspecies Northern Tanganyika, Western Usambara Mts.

1. *Afrocoelichneumon malagassus* (Saussure)

Fig. 40

Ichneumon malagassus Saussure, 1890, in Grandidier, Hist. Phys. Nat. Polit. de Madagascar, XX, pl. 16, figs. 8, 8a, ♀.

Afrocoelichneumon malagassus Heinrich, 1938, Mém. l'Acad. Malg., XXV, pp. 29-30, ♀♂; redescription of ♀, description of ♂. Records: Tananarive, Ampandrandava, Montagne d'Ambre, Mt. Bity, Ambohimanga.

var. *rufescens* Heinrich, loc. cit., p. 31, ♀♀, Fanovana, Rogez, Montagne d'Ambre.

var. *nigrescens* Heinrich, loc. cit., p. 31, ♀♀, Ankaratra, Montagne d'Ambre.

Types

Holotype.—Not located.

Distribution

Widely distributed in Madagascar; generally rare.

Preamble

One of the largest species of the genus, distinguished by the not carinate, flat scutellum, presence of a distinct scopa on coxae III of females, and the uniformly red abdomen.

Female

Abdomen uniformly, legs predominantly red; head and thorax extensively black, both with rich white markings; mesoscutum with rounded white median mark; scutella white; length 13-18 mm.

Flagellum.—Moderately long, fairly stout, subbristle-shaped, distinctly, though not strongly, widened beyond middle, slightly attenuated toward apex, with 40-44 segments, the first scarcely 2.5 times as long as wide, the 7th square, the widest about twice as wide as long. Black, with complete white annulus on segments 8 or 9 to 17 or 18; scape usually reddish on ventral side.

Head.—Wide; temple profile broadly rounded, not narrowed; cheeks in lateral view wide and somewhat swollen; malar space not quite as long as width of mandible base; clypeus medio-apically slightly projecting. Black, middle of clypeus, apex of cheeks at mandible base and malar space medially usually ferruginous-tinged; the following white: sides of clypeus more or less extensively, base of mandibles, orbits around eyes very broadly, always widely interrupted at temples, often very narrowly at malar space; in var. *nigrescens* white on clypeus and outer orbits strongly reduced.

Thorax.—Mesoscutum with shallow, sparse puncturation; scutellum not carinate, not raised above postscutellum, dorsally scarcely convex apically truncate, smooth and shiny; mesopleura and metapleura strongly and fairly densely punctured; central area of propodeum (fig. 40) large, nearly parallel-sided, distinctly longer than wide, with apical carina. Black; sometimes mesosternum, pleura and propodeum more or less extensively ferruginous (var. *rufescens*); usually at least areae spiraculiferae and central area reddish; the following white: pronotal base, pronotal ridge with about upper third of propleura, subalarum, rounded median mark on mesoscutum, scutella, transverse band on lower half of mesopleura, carinal triangle, and indistinctly limited marks on apices of areae dentiparae.

Legs.—Stout, femora thick; coxae III with distinct scopa. Predominantly bright red, including coxae and trochanters; coxae I and II partially yellowish or orange-tinged; all tarsi and the tibiae III infuscated, tarsi III blackish.

Wings.—Clear in both sexes; areolet pentagonal, but very narrow in front.

Abdomen.—Tergites 2 and 3 strongly and rather densely punctured, medially not striate, but punctures in the middle partially running into longitudinal, irregular rugosity. Uniformly red.

Male

White are, in addition to white markings of female: face and clypeus uniformly, prosternum, mesosternum, and coxae I and II almost entirely, trochanters I and II ventrally, dorsal mark on coxae III, exterior parts of prepectus, mark on apex of metapleura; scape ventrally; flagellum black, without annulus; otherwise like female; length 15 mm.

Flagellum.—With 44 segments and with bacilliform tyloids on segments 8 or 9 to 17, the longest on segments 11 or 12 to 15, dash-shaped, not quite reaching bases and apices of segments.

2. *Afrocoelichneumon rubidus* (Tosquinet)

Distribution

Eastern Cape Province (type locality) and Nyasaland (ssp. *scopulifer* Morley).

Preamble

Rather closely related to *malagassus* Saussure. Agrees with the latter species in the flat, noncarinate scutellum, the presence of a scopa on coxae III in females, the uniformly red abdomen and the white median mark on mesoscutum. Nevertheless probably to be regarded as a distinct species. Differs by smaller size, red basic color of head and thorax including mesoscutum, and coarser sculpture of tergites 2-4, particularly of tergite 4 which is nearly smooth in *malagassus*, rather densely and strongly punctured on anterior half in *rubidus*. The specific association of *rubidus* and *scopulifer* is still hypothetical and needs final confirmation. Unfortunately in the type of *rubidus* the flagella are both broken and with them one of the most distinctive characters is missing.

Female

Abdomen uniformly, legs predominantly red; basic color of head and thorax (including mesoscutum) red, both with rich white and sometimes restricted black markings; mesoscutum with rounded, white median mark; scutella white; coxae III with distinct scopa; length 12-14 mm.

Flagellum.—Fairly short, with 37 segments (according to description of *rubidus* and to examination of type of *scopulifer*), subbristle-shaped, only slightly attenuated toward apex, not distinctly widened beyond middle. Black, with white annulus.

Head.—Wide; temple profile rounded, scarcely narrowed. Red, with subspecifically varying white markings.

Thorax.—Mesoscutum rather finely and densely punctured, shiny; scutellum nearly flat, laterally not carinate, not raised above postscutellum, apically truncate, smooth and shiny; propodeum, except smooth central area, strongly and regularly punctured. Red with subspecifically varying white markings on pleura and propodeum.

Legs.—Stout, femora thick. Predominantly red; legs III partially infuscated.

Wings.—Clear; areolet pentagonal.

Abdomen.—Narrower than in *malagassus;* tergites 2 and 3 coarsely and densely punctured, the second medially with longitudinal striation; basal part of fourth tergite strongly punctured. Uniformly red.

2a. *Afrocoelichneumon rubidus rubidus* (Tosquinet), new combination

Ichneumon rubidus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, pp. 45-47, ♂♀.

Types

Lectotype.—♀, "Capland, Krebs". Z.M.H.U. No. 9323; flagella missing; designated by Heinrich, 1964.

Allotype.—♂, same locality. Z.M.H.U. No. 9323.

Distribution

Eastern part of Cape Province, probably region of Grahamstown (see introduction, section "Location of some type localities").

Female

Abdomen uniformly, head, thorax, and legs basically red; white marks on head, thorax, coxae, and trochanters less extensive than in subspecies scopulifer *Morley; no infuscations on thorax; legs III more extensively infuscated; frons and face medially blackish, length 14 mm.*

Flagellum.—Broken in type; according to original description, with 37 (= 39 including scape and pedicel) segments, as long as head and thorax together, fairly stout, slightly attenuated toward apex. Segments 1-9 black, apically narrowly reddish, 10-14 with dorsal white annulus, the following blackish-brown.

Head.—Red, face and frons infuscated; the following white: upper part of facial orbits and frontal orbits up to lower ocellus rather broadly, large vertical spots and small marks on lower, outer orbits.

Thorax.—Red; the following white: collare, pronotal ridge broadly, pronotal base, subalarum, large, rounded median mark on mesoscutum, scutella, dot on carinal triangle, mark on lower apical angle of mesopleura.

Legs.—Coxae III with distinct scopa. Red; tibiae and tarsi II and III infuscated; the following white: tibiae I and II and apices of femora I and II on inner side.

Male

Somewhat similar to *natalensis* Cameron ♂, but puncturation of median lobe of mesoscutum finer, of fifth tergite coarser; abdomen red toward base, black toward apex (reversed in *natalensis).*

More extensively black than female; basic color of head and prothorax blackish; red color of mesoscutum darker than in female; abdomen basally red, gradually stronger infuscated toward black apex; flagellum black, without annulus; white more extensive than in female; length 14 mm.

Flagellum.—With narrow lanceolate tyloids on segments 9-13. Black, without annulus; scape ventrally white.

Head.—Black; the following white: clypeus, sides of face broadly, upper part of face below antennae, outer orbits broadly up to temple region, frontal orbits, and vertical marks.

Thorax.—Dark red, mesosternum and pronotum black; the following white: collare, pronotal ridge and base, subalarum, median mark on mesoscutum, scutella, entire carinal triangle, mark on exterior part of prepectus, mark on mesopleura.

Legs.—Red; basic color of coxae and trochanters I and II blackish; the following white: mark on coxae I and II, apical margin of trochanters I and II, inner side of femora and tibiae I and II.

2b. *Afrocoelichneumon rubidus scopulifer* (Morley)

Coelichneumon scopulifer Morley, 1919, Proc. Zool. Soc. London, p. 140, ♀.

Afrocoelichneumon scopulifer Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 30 (wrongly as synonym or perhaps subspecies of *Afrocoelichneumon malagassus* Saussure).

Types

Holotype.—♀, "Nyasaland, Mlanje, Aug. 15. 1913, S.A. Neave". B.M. No. 3b-67.

Distribution

Nyasaland.

Female

Abdomen uniformly, legs predominantly red; head and thorax red, including mesoscutum, with some black parts, and more extensively white-marked than ssp. rubidus *Tosquinet; mesoscutum with rounded white median mark, scutella white; all white markings clearly defined; length 12 mm.*

Flagellum.—With 37 segments, fairly short and stout, slightly attenuated toward apex, only slightly widened beyond middle, first segment not quite 3 times as long as wide, about the 8th square. Black, with white annulus on segments 7 (apex) to 16.

Head.—Red, temple region black; the following white: mandible base, clypeus laterally, orbits around eyes broadly (narrowly interrupted at temples and malar space), widened somewhat on frons, below ocelli, and particularly on upper part of face.

Thorax.—Red; the following black: pronotum medially behind collare, prepectus extensively, patch below subalarum, median line on mesosternum; the following white: (as in ssp. *rubidus)* collare, pronotal ridge, pronotal base, subalarum, rounded median mark on mesoscutum, scutella, carinal triangle; also white are: medially interrupted, transverse band on lower half of mesopleura extending in front onto prepectus, small marks on apical parts of metapleura, longitudinal lines on carinae dentiparae interiores.

Legs.—Coxae III with distinct scopa. Red; tarsi II and III infuscated; coxae I and II white-marked, trochanters I and II ventrally white, coxae III with dorsal white mark.

Abdomen.—Tergites 2 and 3 and basal part of tergites 4 coarsely punctured, the second dorso-medially striate. Red.

3. *Afrocoelichneumon noerus* (Tosquinet), new combination

Ichneumon noerus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, p. 10, ♀♂.
Melanichneumon carinifer Morley, 1919, Proc. Zool. Soc. London, p. 148, ♀; new synonymy.

Types

Ichneumon noerus Tosquinet:
Lectotype.—♀, "Scioa, Sciotalit, Ragazzi, VII.1887"; (label handwritten by Tosquinet). M.C.H.N. Designated by Heinrich 1964.
Allotype.—♂, "Scioa, Let Marefia, Ragazzi, VII.1887". M.C.H.N.
Paratype.—♀, "Scioa, Let Marefia, VII.1887". M.C.H.N.
Melanichneumon carinifer Morley:
Holotype.—♀, "Harrar, Abyssinia, R. E. Turner, May 1911". B.M. No. 3b-259.

Distribution

Abyssinia.

Preamble

The only species of this genus so far known with entirely black abdo-

men. Very similar in color pattern to *Corymbichneumon connexius meruensis* Heinrich, but by structure of scutellum, head, subalarum, and pronotal ridge clearly differing as a species of the genus *Afrocoelichneumon*.

Female

Black; mesoscutum with ivory median mark; ivory are also: upper half of propleura with pronotal ridge, subalarum, and frontal orbits; femora and tibiae I and II almost uniformly light ochreous; flagellum without white annulus; length 18 mm.

Flagellum.—Bristle-shaped, fairly slender, not widened beyond middle, with 44 (according to original description) or 45 (specimen from Harrar) segments, about the 14th square. Black, the basal segments apically brownish, or entirely brownish (specimen from Harrar), gradually infuscated toward apex.

Head.—Wide; temple profile broadly rounded, scarcely narrowed behind eyes; cheek profile slightly curved in front view, cheeks somewhat swollen. Black; upper part of facial orbits, frontal orbits, and stripe on outer orbits ferruginous.

Thorax.—Scutellum laterally not carinate, only slightly convex, smooth and shiny; subalarum swollen; pronotal ridge slightly widened; central area slightly narrowed toward postscutellum. Black; the following ivory: about upper half of propleura with pronotal ridge, subalarum, large rounded median mark on mesoscutum.

Legs.—Legs III and all coxae and trochanters black; femora, tibiae, and tarsi I and II almost uniformly light ochreous.

Wings.—Clear; areolet pentagonal, moderately narrowed in front.

Abdomen.—Uniformly black; sutures between tergites ferruginous.

Male

Black; white markings as in female; white are in addition: base of mandibles, clypeus laterally, facial orbits broadly, frontal orbits more narrowly up to level of lower ocellus, narrow stripe on middle of outer orbits, mark on tegulae, mark on apex of areae dentiparae, marks on exterior parts of prepectus, dot on apex of coxae I, sometimes dot on apex of pronotal base and on dorsal side of coxae III; flagellum black, ventrally brownish; length 18 mm.

Flagellum.—With elongate-oval tyloids on segments 9-17.

Abdomen.—Tergites 2 and 3 medially distinctly and rather strongly longitudinally striate. Black; sutures of anterior tergites and sometimes the entire last tergite ferruginous.

4. *Afrocoelichneumon subflavus* Heinrich

Afrocoelichneumon subflavus Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 29, ♀♂.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, III.-IV.1931, leg. A. Seyrig". C.G.H. I.

Paratypes.—♀♂, from type locality. M.N.H.N.

Distribution

Madagascar, Rogez and Périnet; throughout the year.

Preamble

A somewhat smaller species, with scutellum laterally carinate at the very base; white anal marks and median mark on mesoscutum present.

Female

Head predominantly white, with some black markings; thorax dorsally extensively black, with white median mark on mesoscutum, the basic color of the latter varying from (rarely) black to (usually) blood-red; abdomen light red, tergites 6-7 with large white anal marks, tergites 1 and 5-7 extensively black; legs predominantly light red; length 13 mm.

Flagellum.—Fairly short, stout, subbristle-shaped, distinctly widened beyond middle, moderately attenuated toward apex, with 40 segments, the first about 2.5 times as long as wide, the 8th square, the widest nearly 3 times as wide as long. Black, with complete white annulus on segments 6 (apex) to 17.

Head.—Temple profile wide, rounded; cheeks wide in lateral view, only slightly narrowed toward mandible base in frontal view; malar space not quite as long as width of mandible base; clypeus slightly projecting medially at apex; frons smooth, face and clypeus sparsely punctured. White; the following black: ocellar region with occipital and temple regions and the antennal cavities.

Thorax.—Mesoscutum smooth and shiny, with few scattered, shallow punctures; scutellum not raised above postscutellum, dorsally rather flat, smooth and shiny, laterally carinate at the very base only; propodeum strongly and rather densely punctured, except central area which is almost smooth, slightly narrowed toward postscutellum, and distinctly longer than wide; mesosternum and mesopleura smooth and shiny with scattered punctures. Light red; the following black: basic color of pronotum, upper part of mesopleura, lateral areae of horizontal part of propodeum; mesoscutum varying from black to blood-red; the following white or yellow: collare, pronotal ridge, pronotal base, subalarum, scutella, rounded median mark on mesoscutum, broad, transverse band on inferior half of mesopleura, exterior part of prepectus, sometimes mark on metapleura, prosternum usually predominantly.

Legs.—Rather stout; femora thick; no scopa. Light red; tibiae and tarsi III somewhat infuscated; coxae II usually white-marked dorsally.

Wings.—Clear; areolet quadrangular.

Abdomen.—Median field of postpetiole fairly densely punctured; gastrocoeli moderately large and deep; tergites 2 and 3 fairly densely punctured, medially not striate. Tergites 2-4 entirely and the fifth tergite laterally light red, 6-7 with large white anal marks; basic color of tergites 1, 6, and 7, and the median part of the fifth tergite black.

Male

White color on mesopleura more extensive, on frons more restricted than in female, the sixth tergite without anal mark; fifth tergite entirely, the sixth extensively red; flagellum black with white annulus on segments 13 to 18 or 19; length 13 mm.

5. *Afrocoelichneumon cornelliger* (Morley)

Distribution

Nyasaland (type localitiy); Tanganyika: Western Usambara Mts. and Uluguru Mts. (C.G.H. II.); Angola: Calulo distr. (C.G.H. II.); in medium and lower altitudes.

Preamble

Differs from the majority of forms included in this genus by partially carinate scutellum, narrower temples and cheeks and slenderer legs. A pretty, multicolored species, with latero-apical white marks at least on the postpetiole, sometimes on the basal two or three tergites, but always without anal marks. Head and thorax usually tricolored: red, with black and very rich white markings; in males usually basic color of head and thorax entirely black, without red parts. Clearly distinguished by the scutellum laterally carinate to the middle, lack of scopa on coxae III in females and distinctly pentagonal areolet. Tyloids of males elongate-oval, not quite as narrow as in most other species. Flagellum of females slenderer than normally in this genus.

Female

Head and thorax predominantly red with geographically varying black and always rich white markings; abdomen red with first tergite usually black-marked, and with apico-lateral white marks on the postpetiole, or also on the second tergite; mesoscutum with rounded white median mark, scutella white; legs predominantly red; length 15-17 mm.

Flagellum.—Bristle-shaped, rather slender, scarcely widened beyond middle, strongly attenuated toward apex, with 45 (type) to 46 segments, the first fully 3 times as long as wide, about the 10th square, the widest a little wider than long. Black with dorsal white annulus on segments 9 or 10 to 19 or 20; basal segments apically brownish; scape ventrally partially ferruginous.

Head.—Somewhat less strongly built than in typical species of this genus; temple profile fairly strongly narrowed behind eyes, only slightly curved; cheek profile straight; malar space a little shorter than width of mandible base. The following black: ocellar, occipital, and temple regions, middle of frons broadly down to base of antennae, sometimes lateral fields of face more or less extensively; middle of face and clypeus reddish; the rest white; white on orbits interrupted on temples or not interrupted.

Thorax.—Mesoscutum distinctly and fairly densely punctured; scutellum gradually narrowed and sloping toward postscutellum, comparatively long, laterally carinate to about middle; central area of propodeum slightly narrowed toward postscutellum. Chestnut-red or light-red with subspecifically varying black pattern; black are (in all known specimens): pronotum predominantly, patch on mesopleura below subalarum, outer sutures of mesoscutum, lateral slopes and carinae of scutellum, declivity of propodeum more or less extensively; the black coloring may also occupy the sterna, areae coxales an lateral areae of horizontal part; the following white: collare, pronotal base and ridge, subalarum, median mark on mesoscutum, scutella, band along carinae dentiparae interiores, carinal triangle, marks on mesopleura and metapleura and on prepectus.

Legs.—Fairly long and comparatively slender; coxae III without scopa. Red; coxae and trochanters I and II extensively yellow, coxae III dorsally with black and white mark; tibiae, tarsi, and apices of femora sometimes infuscated.

Wings.—Clear; areolet narrowed in front, but distinctly pentagonal.

Abdomen.—Tergites 2 and 3 densely punctured, but medially without striation. Chestnut-red or light-red; first segment basally and apico-medially usually blackish-infuscated; apico-lateral white marks on post-petiole, sometimes also on second tergite.

Male

(Male from type locality not known). *Face and clypeus uniformly white; white on orbits broadly interrupted on temples and malar space; basic color of thorax, first tergite and coxae III black, usually without, sometimes with restricted, red pattern; white on sterna and mesopleura much more extensive than in female; flagellum black, without annulus; otherwise as in female; length 13-16 mm.*

Flagellum.—With 42-43 segments and with elongate-oval tyloids on segments 9-16, the longest, on segments 11-15, nearly reaching bases and apices of segments. Black; scape ventrally white.

Head.—Black; the following white: base of mandibles, face and clypeus entirely, orbits broadly (interrupted on malar space and broadly on temples); apex of cheeks at mandible base black.

Thorax.—Black; white pattern as in female; white are in addition: apex of prosternum, broad band on lower half of mesopleura, extending below onto mesosternum to sternauli, and in front onto prepectus; it is sometimes interrupted before its narrowed apical part; in specimen from Usambara Mts., pleura extensively red.

Legs.—Basic color of legs III red, apices of femora and tibiae III infuscated; sometimes tibiae III dorsally blackish; legs I and II ochreous; tarsi II and III infuscated to black; white are: coxae and trochanters I and II ventrally, inner side of femora and tibiae I and II; coxae III black with dorsal white mark, sometimes ventrally red.

5a. *Afrocoelichneumon cornelliger cornelliger* (Morley), new combination

Coelichneumon cornelliger Morley, 1919, Proc. Zool. Soc. London, p. 140, ♀.

Types

Holotype.—♀, "Nyasaland, Blandyre, Dr. I. E. S. Old". B.M. No. 3b -66.

Distribution

Nyasaland.

Female

Head and thorax ferruginous-red including mesosternum, entire metapleura and propodeum, except declivity; white color of orbits not interrupted at temples; tibiae and tarsi III infuscated.

5b. *Afrocoelichneumon cornelliger angolicus*, new subspecies

Types

Holotype.—♀, "Angola, distr. Calulo, Quitondo, 11.8.-2.9.1957". C.G.H. II.

Allotype.—♂, same locality and date. C.G.H. II.

Paratypes.—2♂♂, same locality and date. C.G.H. II.

Distribution

Northwestern Angola.

Female

Red basic color lighter than in ssp. cornelliger; *as in the latter ssp. no black on sterna and metapleura; lateral areae of horizontal part of propodeum black, the central area pale ochreous; legs III without infuscations; length 17 mm.*

Head.—No black on lateral fields of face; face, clypeus and cheeks white, the former medially, the cheeks along carina genalis, pale ferruginous; white orbits on temples broadly interrupted.

Thorax.—Pale ferruginous, mesoscutum chestnut-red; the following black: middle of pronotum, patch on mesopleura below subalarum, sutures of mesoscutum, lateral carinae and lateral slopes of scutellum, lateral areae of horizontal part of propodeum, lateral stripes on area posteromedia; yellow are: collare, pronotal ridge and base, median mark on mesoscutum, scutella, subalarum, exterior part of prepectus, mark on anterior and apical part of mesopleura, dot on apex of metapleura, carinal triangle, band on carinae dentiparae interiores.

Legs.—Uniformly light ferruginous; coxae III dorsally with a black and a white mark; coxae and trochanters I and II extensively yellowish.

Abdomen.—Light ferruginous; first tergite basally and apically infuscated, with latero-apical white marks.

Male

Head, thorax, first tergite and coxae and trochanters III black, all with rich white markings; mesoscutum with white median mark, scutella white; tergites 2-7 red, the first, or first and second tergite with apicolateral white marks; legs predominantly red, tibiae and femora III infuscated at the very apices only, tarsi II and III moderately infuscated; flagellum without annulus; length 13-16 mm.

5c. *Afrocoelichneumon cornelliger tanganyikae*, new subspecies

Types

Holotype.—♀, "Northern Tanganyika, Western Usambara Mts., Lushoto, 1600 m, 26.II.1962." C.G.H. II.

Allotype.—♂, "Tanganyika" (perhaps from same locality). C.G.H. II.

Distribution

Northern Tanganyika, Usambara Mts.

Female

Differs from ssp. cornelliger *and* angolicus *by predominantly black mesosternum and black areae coxales; white orbits broadly interrupted on temples, as in ssp.* angolicus, *lateral areae of horizontal part of propodeum red, as in ssp.* cornelliger; *lateral field of face broadly black-marked; tibiae and tarsi II and III, and apices of femora III infuscated; length 16 mm.*

Male

Differs from ssp. angolicus *by predominantly red propleura, mesopleura, metapleura, coxae III, and first tergite; lateral lobes of mesoscutum with red longitudinal bands; apices of femora III and entire tibiae and tarsi III, blackish-infuscated; otherwise like ssp.* angolicus ♂; *length 13 mm.*

6. *Afrocoelichneumon natalensis* (Cameron)

Ichneumon (?) natalensis Cameron, 1906, Ann. S. Afr. Mus., V, pp. 160/61, ♂.
Afrocoelichneumon natalensis Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 28.

Types

Lectotype.—♂, "Natal, 1906." B. M. No. 3b-68. Designated by Morley, 1919, Proc. Zool. Soc. London, p. 141.

Paratype.—♂, "Natal, Malvern." S.A.M.

The two specimens, in London and Cape Town both bear type labels handwritten by Cameron. However, in 1919 Morley had already mentioned the specimen from London as the type. I consider this as the designation of a lectotype.

Distribution

Natal (type locality); Zululand (B.M.); Basutoland (C.G.H. II.).

Preamble

This is the first of a series of forms which are distinguished by apicolateral white marks on anterior tergites, and often in addition by white anal marks.

A three-colored species, basically black, with extensively red pleura and usually apically more or less extensively red abdomen; rich white markings on head and thorax, including white median mark on mesoscutum; abdomen also with white markings. Red as well as white vary so widely individually, that it is difficult to find specimens exactly alike.

Male

Black; chestnut-red are: at least mesopleura, sometimes also metapleura extensively and the abdomen toward apex more or less extensively, usually tergites 4-7 (rarely 2-7); rich and variable white markings on head, thorax, and abdomen; mesoscutum always with median mark and seventh tergite with anal mark; legs varying from red-brown to predominantly black, legs III usually predominantly black; flagellum without annulus; length 13-16 mm.

Flagellum.—With 41-42 segments and elongate-oval tyloids on segments 10 or 11 to 18 or 19. Black, ventrally brownish, without annulus; scape ventrally white.

Head.—Malar space less than half as long as width of mandible base; temple profile wide, distinctly curved. Black; the following white: mandible base, clypeus, face, orbits narrowly interrupted on vertex, more broadly on temples and also on malar space.

Thorax.—Mesoscutum strongly and rather densely punctured, shiny between punctures; scutellum laterally not carinate, except at the very base; area superomedia about as long as wide or somewhat longer than wide. Black; mesopleura always extensively to entirely, rarely also metapleura partially to entirely, chestnut-red; the following always white: collare, at least partially, pronotal ridge broadly, subalarum, scutellum except base, postscutellum, usually also median mark on mesoscutum; the following sometimes white too: marks on tegulae, marks on prepectus, small marks on mesosternum in area of sternauli, small to large marks on apices of areae dentiparae.

Legs.—Varying from chestnut-brown or red to black, usually at least legs III predominantly black; femora and tibiae I ventrally whitish; sometimes coxae I, or I and II more or less white-marked.

Wings.—Clear; areolet considerably narrowed in front, but clearly pentagonal.

Abdomen.—Black; usually tergites 4-7 predominantly or entirely chestnut-red, sometimes also anterior tergites partially reddish, rarely tergites 2-7 red; seventh tergite with oblong white anal mark, rarely also the sixth tergite; tergites 2-3 and sometimes the fourth tergite, usually also the postpetiole, with latero-apical white marks of varying size; rarely lateral marks on anterior tergites medially confluent into apical bands.

7. *Afrocoelichneumon didymatus* (Morley)

Spilichneumon didymatus Morley, 1919, Proc. Zool. Soc. London, p. 161, ♂.
Afrocoelichneumon didymatus Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 29.

Types

Holotype.—♂, "Nyasaland, Mlanje, 4.X.13, 2300 ft., S.A. Neave." B.M. No. 3b-71.

Distribution

Nyasaland.

Preamble

Closely related to *natalensis* Cameron and possibly a subspecies of that species, but chromatically strongly enough differentiated to suggest specific distinction.

Differs from *natalensis* particularly by broadly white pronotal base, white mark on mesosternum, dorsally extensively white-marked coxae III, red tergites 2-7, and red color of all femora, tibiae, and tarsi, except tarsi III.

Male

Black; light red are: mesopleura, metapleura predominantly, all fe-

mora, tibiae, and tarsi, except infuscated tarsi III, and tergites 2-7; rich white markings on head, thorax, and abdomen; mesoscutum with median mark, seventh tergite with anal mark; tergites 1-4 with white apical bands, widened laterally into apico-lateral patches; flagellum without annulus; length 13-15 mm.

Flagellum.—With elongate-oval tyloids on segments 8 to 17. Black, ventrally brownish; scape ventrally white.

Head.—Temple profile rounded. Black; white markings as in *natalensis*: mandible base, clypeus, orbits broadly around eyes, interrupted on temple region and on malar space, widened on outer orbits over nearly entire width of cheeks.

Thorax.—Scutellum carinate at base only. Black, with light-red and white marks; the following red: mesopleura entirely, metapleura predominantly; the following white: collare, pronotal ridge and base broadly, apex of prosternum, mark on mesosternum (between sternauli and border of mesopleura), median mark on mesoscutum, scutellum (except black carinae and narrowly black base), postscutellum, subalarum, tegulae, carinal triangle, areae dentiparae (except basal third).

Legs.—Femora, tibiae, and tarsi red, only tarsi III infuscated.

Abdomen.—First tergite black, the rest red; postpetiole with white apical band which is widened laterally to spiracles; tergites 2-4 with latero-apical white patches which are medially connected by apical white bands.

8. *Afrocoelichneumon pulcher* (Morley)

Distribution

Cape Province, Transvaal, Basutoland, Southern Rhodesia.

Preamble

This is the only female of this genus so far known with apico-lateral white marks on anterior tergites and white anal marks on apical tergites. According to structural considerations only one of the known males with corresponding white abdominal pattern could possibly match it: *natalensis* Cameron. However, the difference in white markings and basic color of mesoscutum of these two sexes makes their association seem somewhat doubtful. I think that some field observations and biological data are needed before it can be considered a matter of fact and *pulcher* be synonymized with *natalensis*.

Female

Black; mesoscutum, pronotum extensively, scutellum, mesopleura, and sometimes middle of metapleura, red; white are: frontal orbits, postscutellum, large anal marks on tergites 6 and 7 and latero-apical marks on tergites 1-3 which are sometimes connected with each other by a narrow apical band on the third tergite; all coxae black, rest of legs predominantly red or brown; length 12-18 mm.

Flagellum.—Bristle-shaped, moderately long and slender, scarcely widened before apex, moderately attenuated, with 40 (type) to 46 segments, the first about 2.5 times as long as wide, the 9th square, the widest only one and one-third times as wide as long. Black, with white annulus on segments 9 (apex) or 10 to 17 or 18 or 20.

Head.—Temple profile scarcely narrowed behind eyes, slightly curved; malar space distinctly shorter than width of mandible base. Black; mandibles, apical margin of cheeks and clypeus apically or entirely, ferruginous; frontal orbits ivory up to vertex (somewhat widened above); sometimes ivory stripe or mark on temple orbits.

Thorax.—Scutellum somewhat raised above postscutellum, apically truncate and gradually rounded, laterally more or less distinctly carinate at base; central area somewhat narrowed from costulae toward apex and usually also toward postscutellum. Black; the following red: pronotum (except black pronotal base), mesoscutum, tegulae, scutellum, mesopleura, often exterior part of mesosternum to sternauli, rarely metapleura partially; postscutellum usually ivory.

Legs.—Moderately long; femora III fairly thick, densely punctured; coxae III without scopa, densely and strongly punctured. All coxae black; femora, tibiae, and tarsi I and II dorsally brownish-red, ventrally lighter red; legs III and trochanters blackish-brown; sometimes femora III predominantly chestnut-red.

Wings.—Clear; areolet pentagonal, rather strongly narrowed in front.

Abdomen.—Gastrocoeli moderately deep and large, thyridia distinct. Black; the following white: apico-lateral marks on tergites 1-3 and large anal marks on tergites 6 and 7; sometimes lateral marks on third tergite connected with each other by a narrow white apical band; rarely a small white apical mark also on the fifth tergite.

8a. *Afrocoelichneumon pulcher pulcher* (Morley), new combination

Melanichneumon pulcher Morley, 1916, Ann. S. Afr. Mus., XV, p. 363, ♀.

Types

Holotype.—♀, "Transvaal, Potchefstroom, T. Ayres." S.A.M.

Distribution

Transvaal (type locality), Basutoland (C.G.H. II.); Cape Province (S.A.M., C.G.H. II.).

Female

Tergites 1-3 with fairly small, latero-apical white marks; white orbital markings restricted to frontal orbits; rarely outer orbits with white mark; femora III blackish-brown.

8b. *Afrocoelichneumon pulcher calossifer*, new subspecies

Types

Holotype.—♀, "Salisbury, Mashonaland, March 1900, G.A.K. Marshall." B.M. No. 3b-73.

The type is kept in the British Museum under the name *Aglaojoppa calossifer* Morley, but this seems to be a manuscript-name only as I was unable to find any record of its publication.

Distribution

Southern Rhodesia, Salisbury (type locality) and Turk Mine (National Museum Bulawayo).

Female

White markings richer than in nominate form: lateral white marks on anterior tergites larger, on the third tergite widened toward middle and confluent; white orbital pattern extended onto vertex; fairly long white band on outer orbits; femora III predominantly red.

21. Genus *Stenapatetor* Heinrich

Stenapatetor Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, pp. 67/68.

Type species.—*Stenapatetor superbus* Heinrich, monobasic.

Distribution

Madagascar.

Preamble

This Madagascan genus is rather closely related to *Coelapatetor* Heinrich and perhaps still closer to *Coeloleptops* Heinrich. It shares the general propodeal structure (distinct basal furrow; fused area superomedia and basalis) with them both, and with *Coeloleptops* besides, the extraordinarily long and slender, strongly bristle-shaped flagellum and almost the same mandible structure. It differs from both these genera by the extraordinarily large gastrocoeli and particularly the thyridia, which are separated from each other by a very narrow bridge, and by differently shaped and sculptured postpetiole. Distinguished from *Coeloleptops* besides by the normally wide (instead of very narrow and elongate) abdomen of females and by the not highly raised scutellum. The extremely rich white abdominal pattern is also unusual for this subtribe, indicating a high degree of specialization.

Morphological characters

Flagellum.—Of females bristle-shaped, extremely slender and elongate, not at all widened beyond middle, strongly attenuated toward apex.

Head.—Temples wide, broadly curved; occiput strongly emarginate, frons a trifle concave; cheeks in lateral view wide and slightly swollen; median field of face only slightly and gradually raised; clypeus flat, with minute medio-apical projection; mandible stout with short body only little longer than in the Compsophorini, with strongly gaping apical teeth, the upper distinctly longer than the lower.

Thorax.—Basal fourth of notauli pronounced; pronotal ridge anteriorly very narrow, gradually somewhat widened toward apex; scutellum dorsally moderately convex, somewhat raised above postscutellum, wide, laterally sharply carinate; declivity of propodeum somewhat longer than central area, the latter not elongate, clearly separated from area posteromedia, anteriorly not projecting toward postscutellum, scarcely narrowed from costulae toward base and apex; basal furrow of propodeum distinct; areae dentiparae deeply and fairly steeply curved down, broad, apically clearly defined and separated from areae posteroexternae.

Legs.—Long and slender; coxae III of female with strong scopa.

Wings.—Clear; areolet quadrangular.

Abdomen.—Of female oxypygous, of normal shape, second tergite longer than apically wide, the third about twice as wide as long; ovipositor

almost entirely concealed; outline of postpetiole approximately quadrangular, its median field obsolete, with some fine, irregular rugosity, the sides sparsely and strongly punctured; gastrocoeli only moderately deep, thyridia extraordinarily large, separated only by a very narrow, striate bridge; second and third tergites coarsely and densely rugose-punctate, also the fourth tergite rather strongly punctured.

1. *Stenapatetor superbus* Heinrich

Stenapatetor superbus Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 68, ♀; colored figure: pl. III, fig. 14.

Types

Holotype.—♀, "Madagascar, Diégo Suarez, Montagne, d'Ambre, 900 to 1000 m, 20.-26.I.1934, leg. A. Seyrig." C.G.H. I.

Distribution

Madagascar, Montagne d'Ambre.

Female

Head white with dorsal black markings; thorax ferruginous-red, with restricted black and white markings; scutellum red, apically black and white; abdomen black with extremely rich white markings on all tergites; legs predominantly ferruginous-red; flagellum black with white annulus; length 15 mm.

Flagellum.—Very long, very slender, not widened, and strongly attenuated toward apex, with 45 segments, the first more than 4 times as long as wide, about the 13th square, none wider than long. Black, with dorsal white annulus on segments 8 (apex) to 15; scape ventrally brownish, with white dot at base below; basal segments to annulus apically brownish.

Head.—Face and clypeus distinctly and fairly densely punctured; frons and vertex very finely coriaceous, not punctate. White; the following black: apical border of cheeks at mandible base, antennal cavity, ocellar region, a narrow, longitudinal band on middle of frons connecting these, occipital and temple regions, the black of the latter narrowly extending to the border of eyes.

Thorax.—Fairly strongly and densely punctured, except speculum which is smooth, and except basal half of horizontal part of propodeum which is irregularly, finely rugose; scutellum less densely punctured than mesoscutum. Ferruginous-red; the following white: collare, pronotal ridge, marks on prescutellar carinae, apex of scutellum narrowly, postscutellum; the following blackish-infuscated: median part of pronotum, areae superoexternae partially, most of central area; scutellum tricolored: basal third ferruginous, the rest black except narrow white apical band.

Legs.—Ferruginous; tibiae and tarsi slightly infuscated; coxae I anteriorly indistinctly whitish-marked.

Abdomen.—Black; the following white: postpetiole laterally, large triangular latero-apical marks on second and third tergites almost touching each other medially on the latter; smaller, latero-apical marks on fourth tergite, apical bands on tergites 5-7.

22. Genus *Pseudocillimus* Roman

Fig. 26

Pseudocillimus Roman, 1910, Ent. Tidskr., XXI, p. 152.

Type species.—*Cillimus major* Szépligeti, monobasic.

Distribution

Tanganyika; Angola; South Africa; Madagascar.

Preamble

This is a somewhat problematic genus. Its taxonomic position is arbitrary, as the propodeal structure of the type species (fig. 26) is such that it distinctly suggests placement in the tribe Ichneumonini, while the rest of the features indicate a rather close relationship to the genera *Leptophatnus* Cameron and *Stenapatetor* Heinrich and thus to the subtribe Apatetorina of the Protichneumonini. This is the problem we have to cope with so often in the taxonomy of this young subfamily: the existence of intermediate forms between all higher categories. I am associating the genus *Pseudocillimus* here with what seems to be its nearest relatives, the Apatetorina, indicating the fact that with a schematic application of the tribe diagnosis, it could, or should be placed in the tribe Ichneumonini. Another reason for some dissatisfaction is the rather strong structural difference between the two species included, which agree so closely in color.

The following four characters are shared by the two species:

1. The unusually rich, white pattern on the abdomen which includes large latero-apical marks on tergites 1-3 and anal marks on tergites 5 or 6 to 7.
2. The rather sharply pointed areae dentiparae which are not, or scarcely, curved downward (fig. 26).
3. The distinct carinae coxales.
4. The strong sclerotization and extensive, coarse, but not aciculate, sculpture on the second and following tergites of the abdomen which includes — in contrast to almost all other genera of the Apatetorina — at least the basal half of the fourth tergite, sometimes its entire surface.

The four characters mentioned above represent all the essential differences from the closely related groups, in particular character 1 and 4 from *Leptophatnus* Cameron, 1, 2, and 4 from *Coelapatetor* Heinrich, 2 from *Stenapatetor* Heinrich.

Morphological characters

Flagellum.—Of females bristle-shaped, fairly long in type species, ventrally distinctly flattened and more or less widened beyond middle; of males with row of narrow tyloids; sigilla indistinct.

Head.—Temples and cheeks moderately swollen, temple profile broadly rounded; clypeus normal, basally scarcely convex, with minute, apicomedian projection; ocellar triangle, in type species, with distinct median impression and surrounding furrow; mandibles stout and wide, in females the short, blunt, lower tooth separated from the longer, upper one by a distinct gap; in males teeth subequal and gap more pronounced.

Thorax.—Mesoscutum longer than medially wide, rather strongly punctured; notauli subobsolete in type species, anterior fourth distinct

in *rubrithorax* Morley; scutellum slightly (type species) to moderately raised above postscutellum, laterally sharply carinate; carination of propodeum (fig. 26) sharp and complete, including carinae coxales; areae dentiparae only slightly slanting downward, scarcely curved, apically pointed; area centralis angularly widened at costulae, moderately narrowed from costulae to apex, usually somewhat widened toward base, in type species less than twice as long as area posteromedia; basal furrow of propodeum distinct.

Legs.—Moderately long and moderately slender; coxae III of females in type species without distinct scopa.

Wings.—Clear; areolet, in type species, almost quadrangular, in *rubrithorax* more distinctly pentagonal.

Abdomen.—Of females oxypygous; first tergite punctate, medially sometimes smooth; tergites 2-4 rather strongly sclerotized and coarsely and densely rugose-punctate; gastrocoeli large and deep, space between narrower than one of them.

Chromatic characters

Thorax predominantly or entirely red, with very restricted white markings; abdomen black, with very extensive, white pattern: tergites 1-3 with large, apico-lateral marks, tergites 5-7 or 6 and 7 with white anal marks.

Key to the species of *Pseudocillimus* Roman
Females and Males

1. Frons smooth; notauli subobsolete; flagellum of females scarcely widened beyond middle, widest segment about 1.5 times as wide as long; coxae III of females without distinct scopa. (Tergites 5-7 in both sexes with white anal marks; length 14-15 mm.) ..... 1. *major* (Szépligeti)
   Tanganyika; Zululand

   Frons transversely rugose; anterior fourth of notauli distinct; flagellum of females strongly widened beyond middle, widest segment about 3 times as wide as long; coxae III with distinct scopa. (Tergites 6-7 in females, 7 in males, with white anal marks; length 13-15 mm.) ..... 2. *rubrithorax* (Morley)
   Tanganyika south to Transvaal; Madagascar, Rhodesia, Angola.

1. *Pseudocillimus major* (Szépligeti)

Fig. 26

Cillimus major Szépligeti, 1910, Sjöst. Kilim. Meru Exped., VIII, p. 66 and pl. 5, fig. 2, ♀♂.

Pseudocillimus major Roman, 1910, Ent. Tidskr., XXXI, p. 152.

Holcichneumon vindex Morley, 1926, Ann. S. Afr. Mus., XXIII, pp. 440, 441, ♂; new synonymy.

Types

Lectotype.—*Cillimus major* Szépligeti ♀, "Kilimandjaro-Kibonoto, Kulturzone, Mai."; present designation. N.R.M.

Allotype.—♂, same locality. N.R.M.

Holotype.—*Holcichneumon vindex* Morley, ♂, "Zululand, Mfongosi, March, 1917, leg. E. Jones." S.A.M.

Distribution

North Tanganyika: Kilimanjaro (type locality); southwest Tanganyika: Mbeya (C.G.H. II); Zululand: Mfongosi (type locality of *Holcichneumon vindex* Morley, ♂).

Preamble

Similar in color pattern to the following species, *rubrithorax* Morley, but differing strikingly in sculpture of frons, mesoscutum and scutellum which are rather smooth and sparsely punctured (the frons entirely smooth), while coarsely and densely punctured in the following species (the frons transversely rugose). Besides, the proportions of the female flagellum are distinctly differenet.

Female

Head red and black, with restricted white pattern; thorax predominantly red, with restricted white and black pattern; abdomen black with rich white pattern; tergites 1-3 with large white latero-apical marks, 5-7 with white apical pattern; legs predominantly red to predominantly black, the coxae III with large white dorsal mark; length 15 mm.

Flagellum.—With 41 segments (type and specimen from Mbeya), the first fully 3 times as long as wide, the widest about 1.5 times as wide as long. Black, with dorsal white annulus on segments 8 (apex) to 15 (in all three known specimens); scape black.

Head.—Ocellar triangle with distinct median impression and surrounding furrow; temples and cheeks distinctly swollen; face and clypeus finely and moderately densely punctured, upper part of head smooth; clypeus normal, basal convexity scarcely indicated. Face and clypeus red, usually also lower part of cheeks and restricted areas of temples, occiput and frons; otherwise upper part of head black; white are: mandible base, large marks on frontal orbits, irregularly, triangularly projecting toward middle of frons below ocellar triangle, sometimes a small mark on lower, outer orbits.

Thorax.—Mesoscutum moderately strongly and moderately densely punctured; scutellum smooth, with scattered punctures; notauli weakly indicated at base; carination of propodeum (fig. 26) clear and complete, including areae coxales; areae dentiparae with acute, apical angles, distinctly, though not strongly, slanting toward apex of propodeum in a gentle, straight slope, not curved; central area slightly angularly widened at costulae, about 1.5 times as long as posteromedia, narrowed toward apex; basal furrow distinct. Red; the following white: the very tip of scutellum, postscutellum and usually a longitudinal median mark on apical part of central area; black are: prosternum except apex, pronotal base, areae coxales.

Legs.—Moderately slender; coxae III with very indistinct scopa indicated only by somewhat denser hair. Black-brown, tarsi III black, femora III varying to dark red; femora I and II apically and the tibiae I and II ivory on anterior side; coxae III with large dorsal white mark.

Wings.—Clear; areolet not quite quadrangular.

Abdomen.—Postpetiole medio-apically strongly punctured, mediobasally with irregular, longitudinal rugosity, laterally sparsely punctured; gastrocoeli large and deep, each much wider than space between them, with pronounced thyridia; space between with short longitudinal striae; tergites 2-4 coarsely rugose-punctate and fairly strongly sclerotized, but not as sharply separated from each other and not apico-laterally projecting, as in *rubrithorax* Morley. Black, petiole usually dark-red; tergites

1-3 with large triangular apico-lateral white marks, the fifth with broad white apical band, the sixth and seventh predominantly white.

Male

Description based on allotype. *Head black with extensive white markings; thorax red with restricted white markings, propodeum predominantly black; abdomen black; tergites 1-3 with large, latero-apical white marks which on first and second tergite are medially narrowly connected; narrow apical band on fifth and broad anal bands on sixth and seventh tergites white; legs predominantly black, coxae I and II extensively white, coxae III with large dorsal white mark; flagellum black with white annulus; length 14 mm.*

Flagellum.—With 40 segments; narrow, bacilliform tyloids on segments 9-17; segments of about apical half with transverse bristle-ridges on ventral side. Blackish, with white annulus on segments 8 (apex) to 24; scape ventrally white-marked.

Head.—Black; the following white: base of mandibles, clypeus, face (except slightly infuscated lines on sides and middle of median field), frontal orbits up to lower ocellus (widened above), outer orbits below temple region (not reaching to apex of eyes).

Thorax.—Red; black are: pronotal base, propodeum except sides and base; white are: apex of scutellum, postscutellum, a longitudinal median line on apical part of area centralis, splitting apically into two lines, each following the carina dentipara interior to its end.

Legs.—Black; the following white: apices of coxae I and II extensively, large, dorsal mark on coxae III, trochanters I and II ventrally; femora and tibiae I and II anteriorly dull-ivory.

Abdomen.—Postpetiole fairly smooth, medially with faint indication of irregular longitudinal rugosity. Black; the following white: large apico-lateral marks on tergites 1-3 (on tergites 1 and 2 medially narrowly connected), narrow apical band on fifth tergite and broad, anal bands on tergites 6 and 7.

Remark

The holotype of *Holcichneumon vindex* Morley, ♂, from Zululand, differs from the allotype of *Cillimus major* Szépligeti, ♂, from Kilimanjaro, by black mesosternum and mesopleura and some white on the former in the area of the wanting sternauli. This chromatic difference may indicate a subspecific differentiation between the two. This matter needs further attention.

2. *Pseudocillimus rubrithorax* (Morley)

Distribution

Northern Tanganyika south to Transvaal; Madagascar, Rhodesia, and Angola.

Preamble

This species is quite different in structure, and especially in sculpture, from the type species. It is particularly distinguished, in both sexes, by the transversely rugose frons, the very strongly and densely punc-

tured mesoscutum and the anterior tergites sharply separated from each other; besides, in females, by the shorter and much more widened flagellum and the distinct scopa on coxae III.

Female

Head black, only frontal orbits, and often a short line on temple orbits white; thorax uniformly red, only prosternum black and collare often white-marked; abdomen black, tergites 1-3 with large, apico-lateral marks, which on first and third tergites are often medially confluent; sixth tergite with median apical white band, the seventh with large white anal mark; legs black, including all coxae and trochanters; flagellum black with white annulus; length 13-15 mm.

Flagellum.—With usually 41 segments, sometimes 40 or 42, the first about 3 times as long as wide and a trifle shorter than the second, the widest fully 3 times as wide as long. Black, with dorsal white annulus on segments 8-12 (evidently constant over the entire range); segments before annulus apically narrowly brownish.

Head.—Temples wide; temple profile scarcely narrowed behind eyes, moderately curved; cheeks wide in lateral view, but little swollen; entire surface of head punctured or rugose; frons coarsely and irregularly transversely rugose; face and clypeus strongly and rather densely punctured; ocellar triangle without median impression, irregularly rugose. Black; lateral fields of face usually more or less extensively red; white are: always frontal orbits up to lower ocellus and usually a narrow line on lower temple orbits.

Thorax.—Mesoscutum including scutellum strongly and densely punctured; anterior fourth of notauli distinct; scutellum fairly strongly raised above postscutellum, dorsally convex and almost as coarsely punctured as the mesoscutum. Red; prosternum predominantly to entirely black; collare usually white-marked; pronotal base often partially black.

Legs.—Moderately slender; coxae III of females with small but distinct and slightly elevated scopa. Black, including coxae and trochanters; coxae I and II sometimes with small apical white mark; apical margin of trochanters often narrowly white; coxae III often dorsally red-marked.

Wings.—Clear; areolet distinctly pentagonal.

Abdomen.—Of females fairly slender; postpetiole with indication of median field, the latter almost smooth, sometimes with some vestiges of irregular striation, or with a few punctures; lateral fields distinctly punctured; tergites 2-4 strongly sclerotized and sharply separated from each other, coarsely rugose punctate, their apical corners slightly projecting. Black, rarely the first tergite dark-red; the following white: large, latero-apical marks on tergites 1-3 which are usually medially confluent on the third tergite, often on the first, rarely on the second tergite.

Male

Similar to *major* Szépligeti ♂, but at once recognizable by the transversely rugose frons.

Head black, sides of clypeus and face broadly, frontal orbits and outer orbits more narrowly, white; thorax red; sterna and prepectus partially to entirely, pronotal base and propodeum partially black, the latter varying

to entirely red; subalarum, pronotal ridge and apex of scutellum usually white; abdomen black with latero-apical white marks or white apical bands on tergites 1-4, the sixth tergite apico-medially, the seventh predominantly white; coxae I and II extensively white; flagellum black, without annulus; length 14 mm.

Flagellum.—With 39 segments; narrow tyloids on segments 9-18. Black, including scape; no white annulus.

Head.—Black, without red pattern; base of mandibles, clypeus and face laterally, frontal and outer orbits white.

Thorax.—Red; prosternum entirely, mesosternum partially to entirely and usually pronotal base black; prepectus and propodeum varying from red to black; in continental populations the following are usually white: pronotal ridge, collare, subalarum, prescutellar carinae, apex of scutellum, and postscutellum; rarely area centralis medio-apically white-marked.

Legs.—Black; the following white: coxae I and II predominantly, apex of femora I and the tibiae I on anterior side.

Abdomen.—Black; tergites 1-4 with large white latero-apical marks which on first and fourth tergites are usually medially confluent; seventh tergite with white anal mark.

2a. *Pseudocillimus rubrithorax rubrithorax* (Morley), new combination

Aglaojoppa rubrithorax Morley, 1917, Ann. S. Afr. Mus., XVII, p. 196, ♂.

Types

Holotype.—♂, "Mfongosi, Zululand, May 1916, leg. W. E. Jones." S.A.M.

Distribution

Zululand: Mfongosi (type locality); northern Tanganyika: Eastern Usambara Mts. and Mt. Meru (C.G.H. II); Southern Rhodesia (N.M.B.); Natal (S.A.M.); Angola (C.G.H. II).

Females

Of continental populations are, on the average, more melanistic and less erythristic than the populations from Madagascar, particularly on head and coxae III.

Males

Of continental populations differ from Madagascan specimens more clearly than females by more extensive white pattern on thorax; subalarum, apex of scutellum, postscutellum and prescutellar carinae seemingly constantly white. Also, in contrast to populations from Madagascar, propodeum in majority of specimens more or less extensively black.

2b. *Pseudocillimus rubrithorax madagascariensis* Heinrich, new status

Pseudocillimus madagascariensis Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, pp. 114-115, ♀♂.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, IX.-X.1931, leg. A. Seyrig." C.G.H. I.

Distribution

Madagascar: Rogez, Perinet, Anivorano, Tananarive, Ihosi, Ampandrandava; probably distributed over the entire island.

Females

Differ but slightly from the continental subspecies *rubrithorax rubrithorax* Morley by the, on the average, more extensive red pattern on head and coxae III.

Males

Differ more distinctly by restriction of white pattern on thorax and black color on propodeum; out of 15 males (M.N.H.N.) recently examined, none had scutellum apically white or the propodeum black-marked; in 14 specimens pronotal ridge was not white-marked, and in 12 specimens subalarum and prescutellar carinae were without white.

Biological notes

Out of 80 pupae of the noctuid *Pallelia algira* L., A. Seyrig raised a single female of this subspecies.

23. Genus *Aethiamblys*, new genus

Fig. 37

Type species.—Aethiamblys congicus, new species

Distribution

Kenya, Tanganyika, Congo, Cameroons, Basutoland, Eritrea.

Preamble

A genus of somewhat arbitrary tribal position, related to *Afrocoelichneumon* Heinrich and to the Protichneumonini on one side, and to *Afromelanichneumon* Heinrich and the Ichneumonini on the other. Shares with both genera the neatly and densely punctured postpetiole, the steeply and deeply down-curved areae dentiparae and the fairly sharply and angularly projecting hypopygium of males. The principle of the carination of the propodeum agrees with *Afromelanichneumon* in the type species, but comes very close to *Afrocoelichneumon* in some other forms which obviously can not be separated generically from *Aethiamblys congicus*. In this particular character the genus thus seems to link *Afromelanichneumon* with *Afrocoelichneumon*. It is distinguished from both mainly by the semiamblypygous, short-oval abdomen of females and by the very small and shallow gastrocoeli with small to indistinct thyridia; from *Afromelanichneumon* it differs additionally by the not laterally carinate scutellum.

If the association of sexes as presented below proves to be correct (at present too few specimens are known to permit fully assured associations), than we are dealing with a genus displaying extraordinary strong sexual dichroism, the abdomen of females being uniformly black with ferruginous apical segments, of males black with yellowish apical pattern on anterior tergites (and ferruginous apical tergites). This type of sexual dichroism suggests relationship to the Ichneumonini, and so does the carination of propodeum, the superficial gastrocoeli, and the pentagonal areolet; only the steeply and deeply down-curved areae dentiparae call for placement within the tribe Protichneumonini.

Females of *Aethiamblys* are rather different in appearance from *Afrocoelichneumon*. They look, at first glance, very much like some Oriental species of the genus *Amblyjoppa* Cameron, for example, like *brunneipennis* Smith or *aelvanus* Cameron. The males, on the contrary, are sometimes rather similar to *Afrocoelichneumon* males and not easy to distinguish.

Morphological characters

Flagellum.—Of females bristle-shaped, rather stout, slightly widened beyond middle; of males with strongly developed, broadly-oval tyloids, scarcely nodose by transverse bristle-ridges on ventral side.

Head.—Strong, distinctly transverse; temples broad, sometimes swollen, temple profile broad, curved; cheeks short, in lateral view usually wide and somewhat swollen; clypeus medio-apically slightly projecting and more or less coarsely punctured; mandibles robust, fairly long, normal, the apical tooth somewhat longer than the subapical, both not separated by a wide gap.

Thorax.—Mesoscutum usually rather densely punctured, little longer than medially wide; about anterior fourth or fifth of notauli distinct; scutellum laterally not carinate, sometimes raised above postscutellum, dorsally scarcely convex; propodeum short, areae dentiparae steeply curved down backward, to close to the base of coxae III; basal furrow distinct and deep; carination (fig. 37) complete and sharply prominent, including carinae coxales, only areae posteroexternae obsolete, and area basalis reduced to a narrow belt and laterally not distinctly carinate; area superomedia irregularly rugose in type species, usually rather large and approximately horseshoe-shaped, with costulae near to middle; its broadly arched anterior carina tends to be medially irregularly broken and indistinct, area basalis at this point usually slightly projecting toward postscutellum; in the supposed female of *auricomus* Morley, area superomedia almost smooth, basally truncate and medially confluent with area basalis, forming a very distinct projection toward postscutellum, a formation which agrees with *Afrocoelichneumon*.

Legs.—Stout; coxae III of females without scopa.

Wings.—Usually strongly infuscated; areolet distinctly pentagonal.

Abdomen.—Of females broadly-oval, semiamblypygous, apically blunted; gastrocoeli only slightly impressed, small, with indistinct or small thyridia; median field of postpetiole usually fairly distinct, at least basally; tergites 1-3 densely punctured, without striation; hypopygium of males sharply triangularly projecting.

Key to the species of *Aethiamblys* Heinrich

Females and Males

1. ♀♀, abdomen without white or yellow pattern. (Flagella, femora, tibiae, and tarsi uniformly orange or light ferruginous; thorax and abdomen black, with ferruginous pattern; head almost uniformly ferruginous; wings infuscated; length 18-22 mm.) 2

   ♂♂, abdomen, thorax, and head with rich yellow or white pattern. 5

2. Scutellum apically rather strongly raised above postscutellum and truncate, dorsally very sparsely punctured. 3

   Scutellum apically not, or slightly, raised above postscutellum and not truncate, dorsally densely punctured. 4

3. Lateral fields of face above clypeal foveae strongly convex; area superomedia somewhat rugose and medially not fused with area basalis into a conspicuous projection towards postscutellum; tergites 5-7 and almost entire mesoscutum ferruginous. (Length 16 mm.) ..... 4. *eritreae*, new species Eritrea

Lateral fields of face above clypeal foveae scarcely convex; area superomedia nearly smooth, medially fused with area basalis into a conspicuous projection towards postscutellum; only tergites 6 and 7 ferruginous, mesoscutum black with ferruginous, longitudinal lines. (Length 18 mm.) ..... 2. *auricomus* (Morley) Northern Tanganyika

4. Carina genalis straight before carinal junction; mesoscutum, though densely punctured, nevertheless distinctly shiny; temples slightly swollen; lateral lobes of mesoscutum, mesosternum, and mesopleura predominantly, and coxae III entirely black; fifth flagellar segment square, the widest twice as wide as long. (Length 20 mm.) ..... 1. *congicus*, new species Congo

Carina genalis before carinal junction slightly curved; mesoscutum finely and extremely densely punctured, opaque; temples not swollen; entire mesoscutum, mesosternum, and mesopleura predominantly, and coxae III entirely ferruginous; eighth flagellar segment square, the widest only 1.3 times as wide as long. (Length 22 mm.) ..... 3. *camerunensis*, new species Cameroons

5. Abdomen with white anal marks and latero-apical marks on anterior tergites. (Temples distinctly swollen; length 18-20 mm.) ..... 6. *bucephala*, new species Zululand

Abdomen with yellow, apical bands on tergites 1-4 or 5, apex of abdomen dull ferruginous, without anal marks. 6

6. Flagellum black, ventrally ferruginous; scutellum red-brown, only apically white; tibiae III red, yellow at the very base. (Length 17 mm.) ..... 5. *attiguus* (Tosquinet) Eastern Cape Province

Flagellum orange, tip slightly infuscated; scutellum white; tibiae III uniformly red, basally not yellow. 7

7. Scutellum apically distinctly raised above postscutellum, dorsally sparsely punctured; central area of propodeum smooth, not distinctly wider than long; two yellow marks on mesopleura. (Length 14 mm.) 2. *auricomus* (Morley) Kenya, northern Tanganyika

Scutellum apically not raised above postscutellum. dorsally fairly densely punctured; central area of propodeum coarsely irregularly rugose, distinctly wider than long; more than lower half of mesopleura, with part of mesosternum, yellow. (Length 18 mm.) ..... 1. *congicus*, new species Congo

1. *Aethiamblys congicus*, new species

Types

Holotype.—♀, "Congo Belge, P.N.U., R. Kenia (1700 m), 28.III.1947, G.F. de Witte". I.R.S.N.

Allotype.—♂ "Congo Belge, P.N.U., R. Lusinga (1760 m), 7.IV.1947, G.F. de Witte". I.R.S.N.

Distribution

Congo.

Preamble

The female of this species is closely related and rather similar to *auricomus* Morley. The species differs in both sexes from the latter by a flat, densely and strongly punctured scutellum, and by coarsely rugose and wider central area.

Female

Head ferruginous-red; thorax and abdomen black, with restricted ferruginous pattern; median lobe of mesoscutum ferruginous; flagella, including scape, and legs light ferruginous, coxae III black; wings infuscated; length 20 mm.

Flagellum.—Subbristle-shaped, slightly attenuated at apex, ventrally flattened and somewhat widened beyond middle, with 47 segments, the first scarcely twice as long as wide, the fifth square, the widest about twice as wide as long. Uniformly orange, including scape; apical segments dorsally infuscated.

Head.—Structure exactly as in *auricomus* ♀. Light ferruginous; antennal foveae blackish.

Thorax.—Anterior part of notauli distinct; mesoscutum densely punctured; scutellum not abbreviated and not raised above postscutellum, laterally not carinate, dorsally densely and fairly strongly punctured; area centralis not longer than wide, broadly half-oval, basally not carinate and medio-basally projecting toward postscutellum, coarsely, irregularly, longitudinally rugose. Black; the following ferruginous: collare and pronotal base narrowly, pronotal ridge, tegulae, median lobe of mesoscutum, prosternum, mesosternum from sternauli to mesopleura, mark on upper apical part of mesopleura, carinal triangle; scutella and subalarum black, with slight brownish tint.

Legs.—Structure as in *auricomus*. Uniformly pale ferruginous, including coxae I and II; coxae III black.

Wings.—Evenly and fairly strongly infuscated; areolet pentagonal.

Abdomen.—Structure as in *auricomus* ♀. Black; last tergites dull ferruginous.

Preamble to male

Very similar in color pattern and structure to *auricomus* ♂. Differing from the latter structurally—as the female—mainly by the scutellum which is not distinctly raised above the postscutellum and not truncate apically, and by the central area of propodeum which is distinctly wider than long, roughly half-moon-shaped and not smooth, but coarsely rugose. Chromatically differing by the more extensive yellow pattern on thorax including the entire prosternum, part of mesosternum and more than lower half of mesopleura.

Male

Head predominantly yellow with black pattern; mesoscutum blackish, medially extensively dull-ferruginous-tinged, with distinct yellow medio-apical patch; rest of thorax black with very rich yellow pattern; abdomen black, tergites 1-5 with dull-yellowish apical bands, tergites 5-7 extensively dull-ferruginous-tinged; legs and flagella nearly uniformly orange; coxae III black, with large yellow dorsal mark; coxae I and II pale yellow; length 18 mm.

Flagellum.—With fairly broadly oval tyloids on segments 9-12, not quite reaching the bases and apices of segments 11 to 20 and minute on segments 9 and 21. Orange, including scape, with slightly infuscated apex.

Head.—Yellow; the following black: middle of frons broadly, ocellar region, occipital and temple regions, small mark on malar space.

Thorax.—Black; the following yellow: collare, pronotal base, pronotal ridge broadly, subalarum, tegulae partially, irregular apico-median mark on mesoscutum, scutella, prosternum, mesosternum from sternauli to mesopleura, more than lower half of mesopleura, prepectus, large mark on apex of metapleura, areae dentiparae and apical half of areae spiraculiferae, carinal triangle.

Legs.—Orange; coxae and trochanters I and II yellow; coxae III black with large yellow dorsal mark; apex of tibiae III and the tarsi III infuscated.

Wings.—In contrast to female, not infuscated; areolet pentagonal, but fairly strongly narrowed in front.

Abdomen.—Thyridia rather distinct in contrast to holotype. Black; tergites 5-7 dull-ferruginous, 1-5 with dull-yellowish apical bands.

2. *Aethiamblys auricomus* (Morley), new combination

Fig. 37

Amblyteles auricomus Morley, 1919, Proc. Zool. Soc. London, p. 159, ♂.

Types

Holotype.—♂, "Nairobi, B.E.A., June-July 1912, Dr. A.D. Milne". B.M. No. 3b-72.

Neallotype.—♀, "Tanganyika, W. Usambara Mts., Lushoto, 1600 m, 26.II.62, leg. Hildegarde Heinrich". C.G.H. II.

Distribution

Kenya: Nairobi (type locality) and north Tanganyika: West Usambara Mts. (C.G.H. II.).

Preamble

The above association of sexes is hypothetical and tentative. It is based on morphological considerations alone. The extraordinary dichroism displayed by the two sexes associated above seems to be contradictory. Nevertheless I have the intuitive impression that they rather belong together than not.

Male

Head predominantly yellow with some ferruginous-red pattern; mesoscutum predominantly ferruginous with somewhat indistinct medio-apical yellowish patch; rest of thorax black, with rich yellow pattern; abdomen black, tergites 1-4 with even, dull-yellowish apical bands, tergites 5-7 laterally and apically dull-ferruginous; legs and flagella uniformly orange-yellow; wings uniformly infuscated: length 14 mm.

Flagellum.—With oval tyloids on segments 8-17, reaching almost from bases to apices on segments 11-14 and being minute on segments 8 and 17. Uniformly orange-yellow, except slightly infuscated tip.

Head.—Yellow, antennal cavities blackish; the following ferruginous-red: middle of frons, ocellar and occipital regions.

Thorax.—Scutellum dorsally sparsely punctured and shiny, short, distinctly raised above postscutellum, apically slightly truncate, laterally not carinate; area centralis large, about as wide as long, medially projec-

ting toward postscutellum, smooth. Black, mesoscutum predominantly ferruginous, blackish-infuscated exteriorly, medio-apically with indistinct yellowish patch; the following yellow: collare, pronotal base, pronotal ridge with about upper half of propleura, subalarum, scutella, tegulae, prepectus predominantly, marks on lower anterior and posterior part of mesopleura, areae dentiparae and areae spiraculiferae (except part before spiracles), areae posteroexternae, apical part of areae metapleurales, apical border of area superomedia, apex of prosternum; mesosternum from sternauli to border of mesopleura ferruginous.

Legs.—Uniformly orange-yellow; coxae III ventrally black.

Wings.—Uniformly and fairly strongly infuscated; areolet distinctly pentagonal.

Abdomen.—Gastrocoeli small and rather shallow; thyridia fairly distinct; postpetiole densely punctured, the median field basally clearly defined, indistinct toward apex; second tergite nearly as long as apically wide, the following tergites distinctly wider than long; hypopygium triangularly projecting. Black; tergites 1-4 with even, dull-yellowish, apical bands and lateral borders; tergites 5-7 laterally and apically dull ferruginous.

Female

Head predominantly yellowish and ferruginous-red; thorax and abdomen black, with restricted ferruginous pattern; mesoscutum with two ferruginous longitudinal lines and medio-apical patch; scutella ferruginous; flagella, including scape, and legs, orange, coxae II and III black; wings infuscated; length 18 mm.

Flagellum.—Subbristle-shaped, slightly attenuated at apex, ventrally flattened and somewhat widened beyond middle, with 45 segments, the first scarcely twice as long as wide, the 4th square, the widest about twice as wide as long. Uniformly orange including scape; apical segments dorsally infuscated.

Head.—Transverse; temple profile not narrowed behind eyes, curved, temples slightly swollen; small furrows surrounding outer ocelli on vertex; malar space shorter than width of mandible base; cheeks in lateral view wide, slightly swollen; face and particularly clypeus coarsely punctured, the latter with distinct medio-apical projection. Light ferruginous, only antennal cavities blackish; orbits, sides of face, and cheeks indistinctly yellowish-tinged.

Thorax.—Anterior fourth of notauli distinct; mesoscutum densely punctured; scutellum short, distinctly raised above postscutellum, apically somewhat truncate, laterally not carinate, dorsally very sparsely punctured and shiny; area centralis little longer than wide, medio-basally not carinate and projecting toward postscutellum, shiny and fairly smooth, with some irregular rugosity. Black; the following ferruginous: collare, pronotal base, upper third of propleura with pronotal ridge, tegulae, two longitudinal lines on mesoscutum apically confluent before base of scutellum, scutella.

Legs.—Coxae III without scopa, ventrally strongly and moderately densely punctured. Almost uniformly ferruginous-orange, including coxae I; coxae II and III black, trochanters blackish-brown.

Wings.—Evenly and fairly strongly infuscated; areolet pentagonal.

Abdomen.—Rather short-oval, semiamblypygous, tergites 2-7 wider than long; postpetiole densely and strongly punctured, median field basally distinct, apically subobsolete; tergites 2-3 very densely and moderately strongly punctured, subopaque. Black; ferruginous are: tergites 6 and 7 and the hypopygium.

3. *Aethiamblys camerunensis*, new species

Types

Holotype.—♀, "Kamerun, Buea. Preuss S." Z.M.H.U.

Distribution

Cameroons.

Preamble

A large species, rather similar in appearance to *congicus* Heinrich, but distinguished by narrower temples, opaque mesoscutum, more elongate flagellar segments and more extensively ferruginous thorax and coxae.

Female

Head, entire mesoscutum and most of mesopleura and sterna ferruginous; flagella, including scape, and legs including coxae III light ferruginous; wings infuscated; length 22 mm.

Flagellum.—Bristle-shaped, distinctly attenuated at apex, ventrally flattened but scarcely widened beyond middle, with 51 segments, the first less than twice as long as wide, about the 8th square, the widest about 1.3 times as wide as long. Uniformly orange, including scape, dorsally infuscated toward apex.

Head.—Temples and cheeks swollen, temple profile distinctly narrowed behind eyes, slightly curved; carina genalis before carinal junction with slight curve; face and clypeus finely and fairly densely punctured; medioapical projection of clypeus inconspicuous. Uniformly light ferruginous (close to orange).

Thorax.—Basal fourth of notauli distinct; mesoscutum very finely and very densely punctured, opaque; scutellum slightly raised above postscutellum, apically slanting to the latter in a gentle curve, dorsally rather flat and densely and finely punctured, laterally carinate at the very base; area superomedia approximately horseshoe-shaped, its anterior border broadly arched and medially somewhat obliterated, but not interrupted and not projecting toward postscutellum. Ferruginous; the following black: propleura, mesosterna medially, patch below subalarum, lateral slopes of scutella, propodeum.

Legs.—Uniformly pale ferruginous, including all coxae.

Wings.—Evenly and fairly strongly infuscated; areolet pentagonal.

Abdomen.—Structure as in *auricomus*, petiole, however, more abruptly widening into postpetiole, the latter strongly transverse, about three times as wide as medially long, without indication of median field. Black; tergites 6 and 7 ferruginous.

4. *Aethiamblys eritreae*, new species

Types

Holotype.—♀, "Gholeb, Eritrea, IX. (H. Rolle)". Z.M.H.U.

Distribution

Eritrea.

Preamble

Very similar to *auricomus* Morley ♀; differing by distinctly more protruding lower parts of lateral fields of face and by structure of area superomedia; also distribution of black and ferruginous color somewhat different.

Female

Head ferruginous; thorax and abdomen black with ferruginous pattern; mesoscutum ferruginous, except surrounding sutures; scutella black; tergites 5-7 ferruginous; flagella, including scape, orange, apex infuscated; legs light ferruginous, coxae II and III blackish; wings infuscated; length 16 mm.

Flagellum.—Bristle-shaped, moderately attenuated at apex, scarcely widened beyond middle, with 44 segments, the first less than twice as long as wide, the fourth square, the widest scarcely 1.5 times as wide as long. Orange, including scape; apex infuscated.

Head.—Similar to *auricomus*, but cheeks in lateral view somewhat wider and more swollen and lateral fields of face above clypeal foveae distinctly protruding; malar space shorter than width of mandible base; each ocellus partially surrounded by a small furrow; frons, face and clypeus densely and rather strongly punctured. Ferruginous, only antennal cavities partially blackish.

Thorax.—Anterior fifth of notauli distinct; mesoscutum rather densely punctured; scutellum short, distinctly raised above postscutellum, dorsally shiny and sparsely punctured; area superomedia finely rugose and punctate, about as wide as long, approximately hexagonal, with costulae in the middle, slightly narrowed before and behind costulae, its anterior border medially obsolete, without median projection toward postscutellum. Black; the following ferruginous: collare, pronotal ridge, tegulae, and mesoscutum, except surrounding sutures.

Legs.—Femora rather stout, femora III in lateral view little more than three times as long as medially wide. Light ferruginous; coxae II and III and trochanters III black with a slight dark reddish tinge, coxae I more distinctly red.

Wings.—Strongly and evenly infuscated; areolet pentagonal.

Abdomen.—Short-oval; median field of postpetiole only basally distinct. Black; tergites 5-7 ferruginous.

5. *Aethiamblys attiguus* (Tosquinet), new combination

Barichneumon attiguus Tosquinet, 1896, Mém. Soc. Ent. Belg., pp. 47-49, ♂.

Types

Holotype.—♂, "Capland, Krebs." Z.M.H.U. No. 9636.

Distribution

Eastern part of Cape Province, probably region of Grahamstown (see introduction, section "Location of some type localities").

Male

Black, with rich yellowish-white pattern; tergites 1-4 with yellowish apical bands, last tergites dull ferruginous; yellowish marks on apices of areae dentiparae; legs III red-brown including coxae, their tibiae red, narrowly yellow at base, black at apex as are the tarsi III; length 17 mm.

Flagellum.—With 43 segments and with tyloids on segments 9-19. Black, wihout annulus, ventrally ferruginous; scape ventrally yellow.

Head.—Transverse; temple profile broadly rounded. Black; the following yellowish-white: clypeus, face, frontal orbits broadly, vertical marks, cheeks and outer orbits.

Thorax.—Mesoscutum densely punctured; scutellum convex, sparsely punctured and shiny; central area of propodeum fairly smooth and shiny, rather wide in front, with distinct median projection. Dark brown, mesoscutum and scutellum red-brown; the following yellowish: collare, pronotal ridge broadly, tegulae, subalarum, scutellum apically, postscutellum, prepectus, prosternum, small mark on lower apical part of mesopleura, apices of areae dentiparae.

Legs.—Obscure reddish; coxae and femora III reddish-brown, tibiae III red, yellowish at the very base; apex of tibiae III and the tarsi III infuscated; coxae, trochanters and tibiae I and II pale yellow.

Abdomen.—Elongate-oval; anterior tergites densely punctured, subopaque; gastrocoeli small. Dark brown, tergites 1-4 with yellowish apical bands, apical tergites obscure ferruginous.

6. *Aethiamblys bucephala*, new species

Types

Holotype.—♂, "Zululand, Mangusi River, Nov. Dec. 1945, A. Bell Marley". C.G.H. II.

Paratypes.—2♂♂, same locality and date. C.G.H. II.

Distribution

Zululand.

Preamble

The temples are strongly swollen in this species and, for a male, rather broad. This head structure points to *Aethiamblys* rather than to *Afrocoelichneumon*. The same do the small and shallow gastrocoeli with indistinct thyridia and the broad-oval tyloids. The chromatic pattern of the abdomen, however, in particular the white anal marks, are quite different from the other species treated in this genus.

Male

Black, including abdomen and legs III; mesoscutum and scutella extensively dull ferruginous; scutellum usually apically whitish-marked; tergites 1-4 with apico-lateral white marks, 2-4 also with short white medio-apical bands (both sometimes connected to continuous apical bands

on tergites 2-4); tergites 6 and 7 with large, the fifth usually with small anal mark; head extensively white; flagellum dorsally blackish, ventrally orange; length 19-20 mm.

Flagellum.—With 45 segments and longish, broadly-oval tyloids on segments 7-20. Dorsally infuscated, ventrally orange; scape ventrally white-marked.

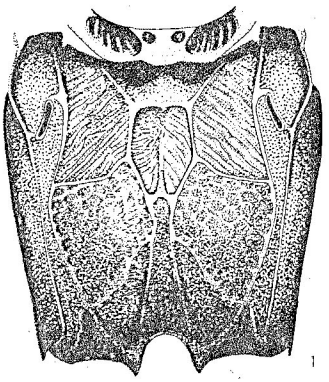
Head.—Very wide; temples distinctly swollen; temple profile not narrowed behind eyes, broadly curved; distinct furrows on vertex surrounding ocelli exteriorly; malar space distinctly shorter than half of width of mandible base. The following white: clypeus and face (except dull-reddish sutures between both), frontal and outer orbits and sometimes vertical mark; ocellar region and small area in front and behind dull ferruginous, as is the posterior part of cheeks below temples; temple region and antennal cavity blackish.

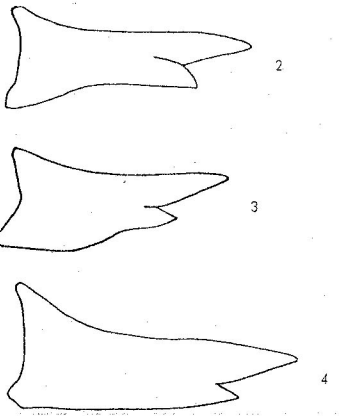
Thorax.—Mesoscutum coarsely and fairly densely punctured, shiny; anterior fourth of notauli distinct; scutellum distinctly raised above postscutellum, gradually curved down apically to the latter, dorsally convex, shiny, moderately densely punctured, not carinate; area centralis smooth and shiny, wider than long, anterior carina only in median part obsolete. Black; the following white: collare, pronotal ridge, prosternum; more or less extensively white are: area of mesosternum between sternauli and mesopleura, apices of areae dentiparae, carinal triangle, subalarum, exterior part of prepectus; sometimes white: pronotal base partially, apex of scutellum indistinctly, postscutellum, mark on mesopleura and small mark on metapleura; the following ferruginous: patch on upper apical part of mesopleura, pronotal base partially, scutellum, sometimes tegulae and postscutellum; middle of mesonotum extensively dull-ferruginous-tinged.

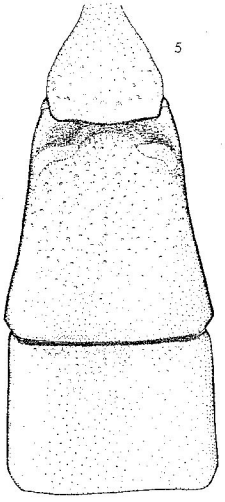
Legs.—Femora stout. Legs III, including coxae, blackish, varying to extensively dark red-brown on femora, coxae and ventral side of tibiae; coxae III usually dorsally white-marked; coxae I and II dull brownish, the former ventrally predominantly white, the latter ventro-apically white-marked; femora and tibiae I and II ferruginous-brown; tibiae and femora I sometimes whitish on interior side.

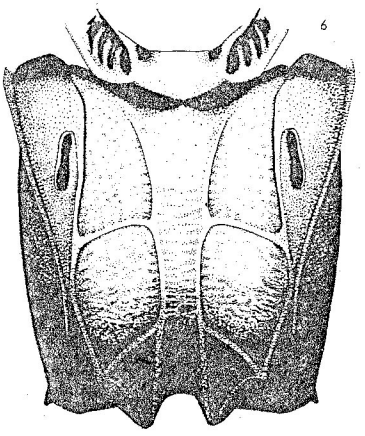
Wings.—More or less strongly infuscated; areolet pentagonal.

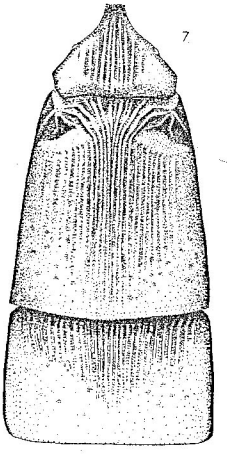
Abdomen.—Postpetiole strongly and densely punctured, the median field basally distinct, apically subobsolete, shiny and sparsely punctured; gastrocoeli small, shallow, with indistinct thyridia. Black; the following white: latero-apical marks on tergites 1-4 and medio-apical bands on tergites 2-4 (both sometimes confluent, forming continuous apical bands on tergites 2-4), large anal marks on tergites 6 and 7 and a small medio-apical mark on the fifth tergite.





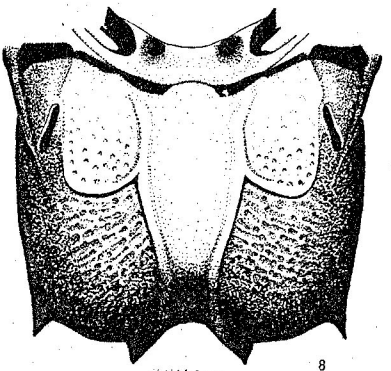


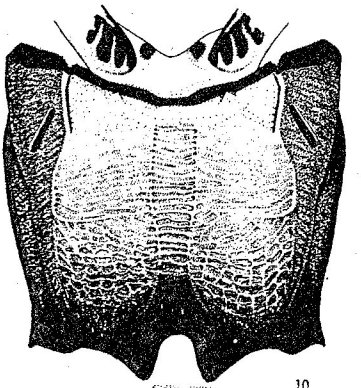


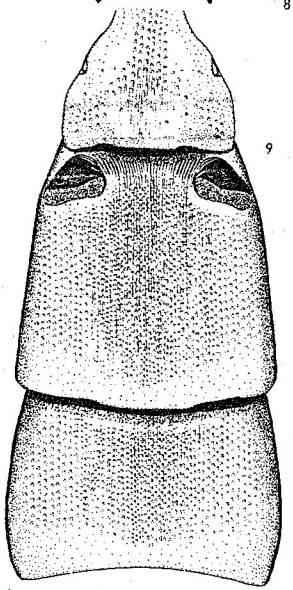


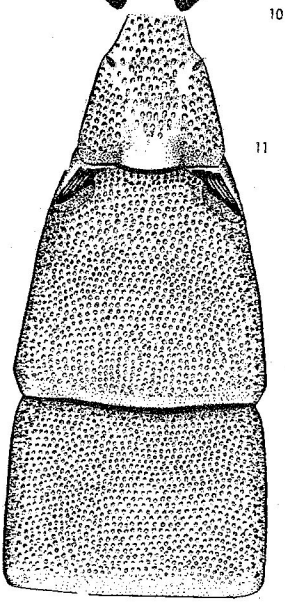
I

Figs. 1-7. 1, *Musakia testacea* (Cameron), ♀, propodeum; 2, *Musakia subtilis* (Szépligeti), ♀, mandible; 3, *Musakia areolator* (Morley), ♀, mandible; 4, *Musakia testacecolor* (Morley), ♀, mandible; 5, *Apatetor blandus* Saussure, ♀, tergites 1-3; 6, *Apatetor blandus* Saussure, ♀, propodeum; 7, *Coelapatetor aciculatior* Heinrich, ♀, tergites 1-3.



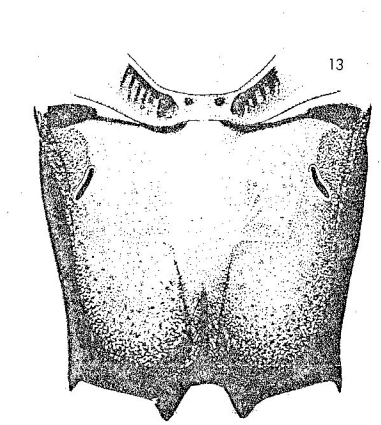


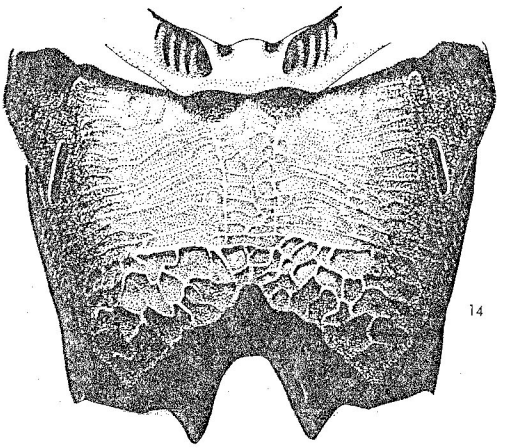


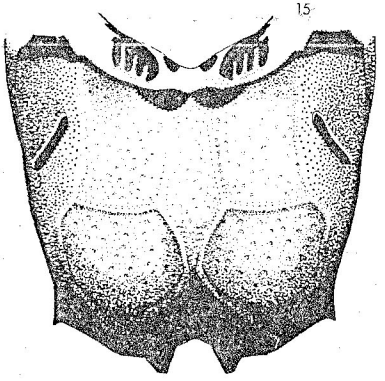


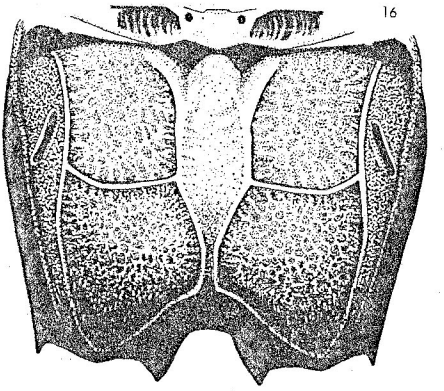
II

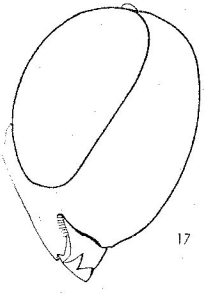
Figs. 8-12. 8, *Protoleptops heinrichi* Heinrich, ♀, propodeum; 9, same species, tergites 1-3; 10, *Punctileptops amboimensis* Heinrich, ♀, propodeum; 11, same species, tergites 1-3; 12, *Leptophatnus xanthocephalus* (Brullé), ♂, flagellum with sigilla.

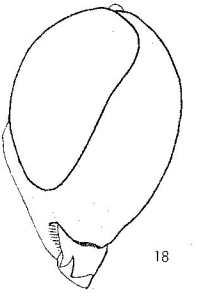






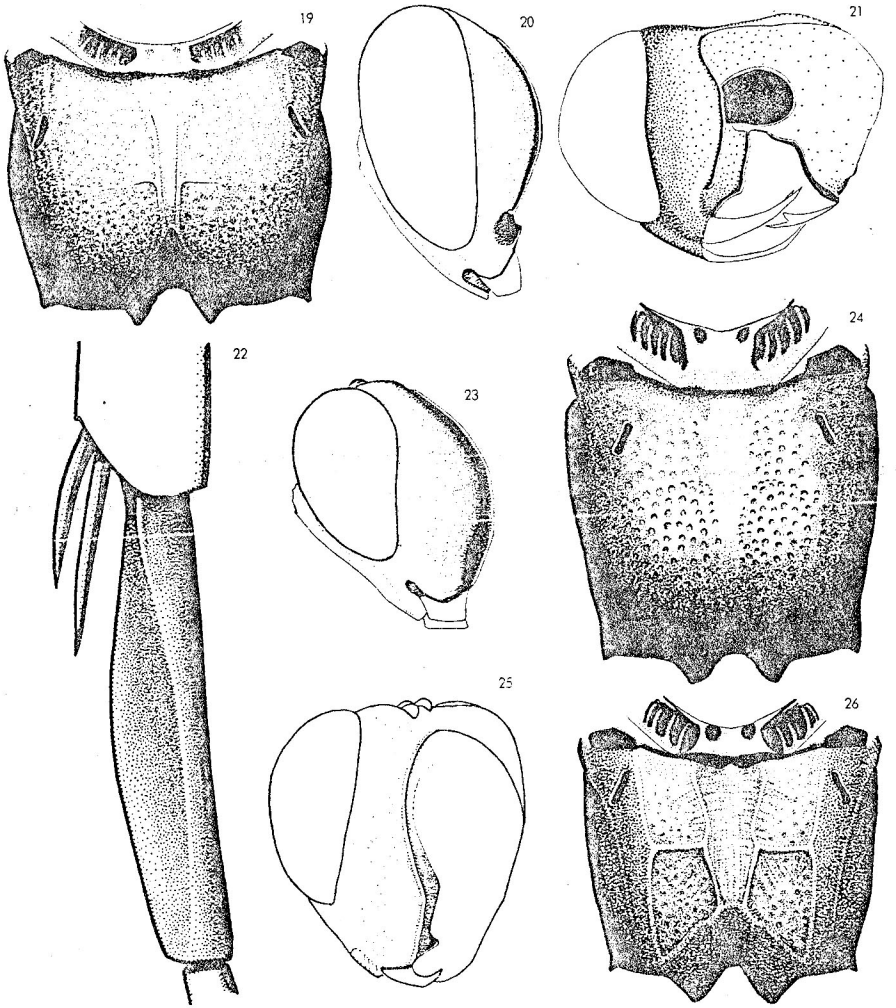






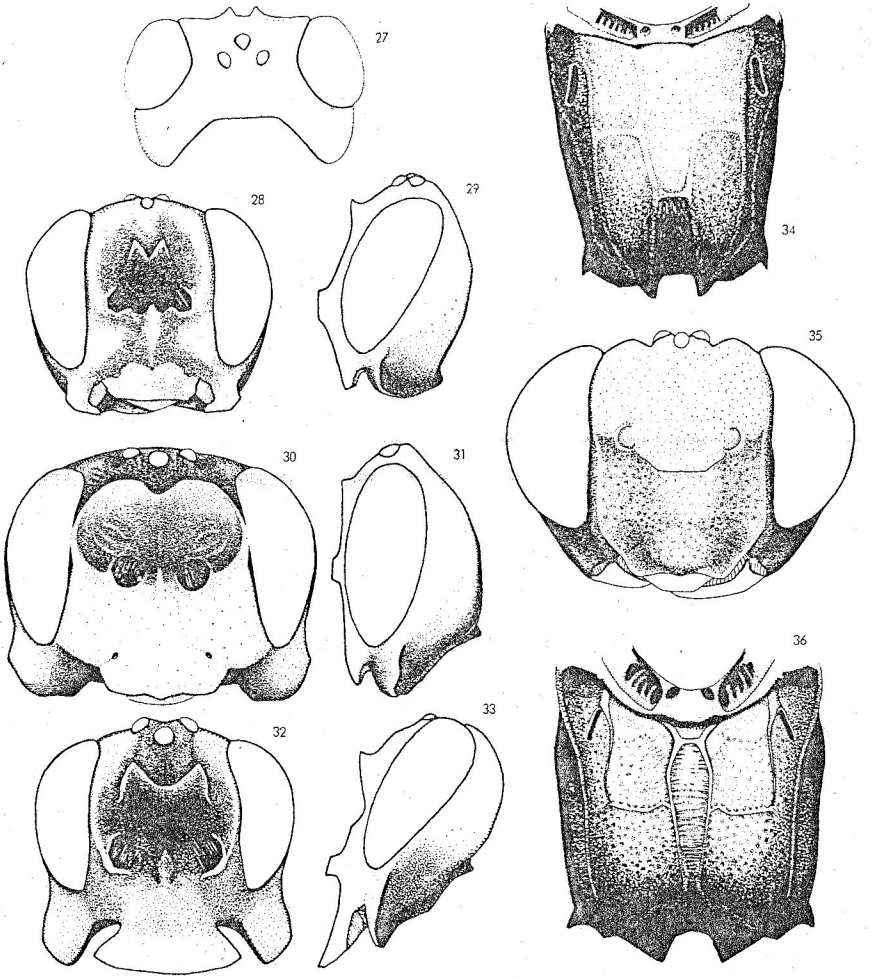
III

Figs. 13-18. 13, *Apatetorops magnificus* Heinrich, ♂, propodeum; 14, *Leptophatnus cariniscrobes* (Morley), ♀, propodeum; 15, *Leptophatnus xanthocephalus* (Brullé), ♂, propodeum; 16, *Leptophatnus crococephalus* (Tosquinet), ♀, propodeum; 17, *Leptophatnus minor* Heinrich, ♀, head (lateral); 18, *Leptophatnus pseudominor* Heinrich, ♀, head (lateral).



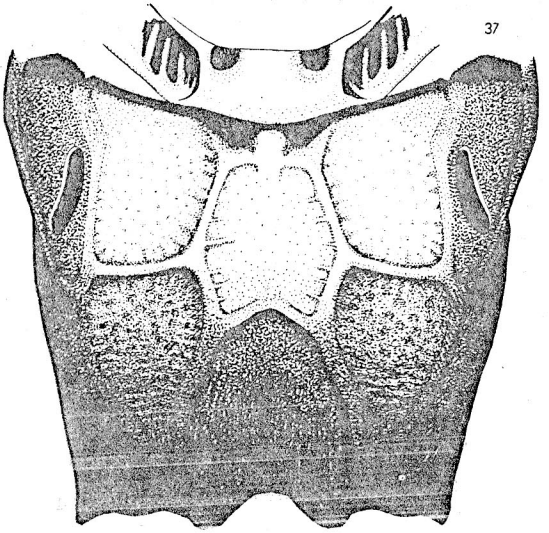
IV

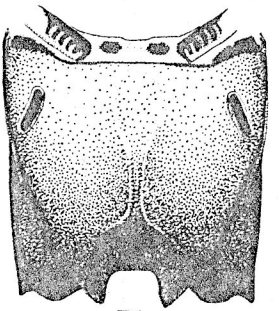
Figs. 19-26. 19, *Pseudophatnus lucifer* (Morley), ♀, propodeum; 20, *Oriphatnus triangulifer* Heinrich, ♀, head (lateral); 21, same species, ♀, head (posterior side); 22, *Triangulora pseudileanta* Heinrich, ♀, metatarsus III; 23. *Fasciphatnus lamelligena* Heinrich, ♀, head (lateral); 24, same species, ♀, propodeum; 25, *Triangulora pseudileanta* Heinrich, ♀, head (lateral); 26, *Pseudocillimus major* (Szépligeti), ♀, propodeum.

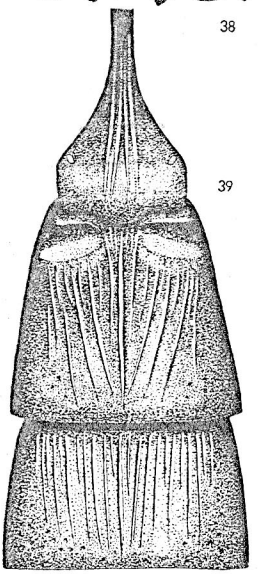


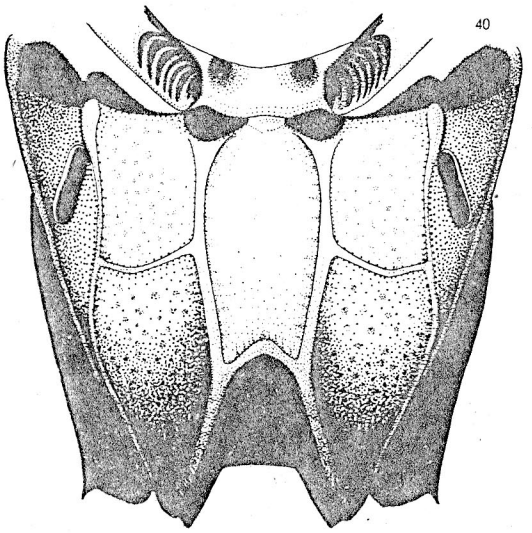
V

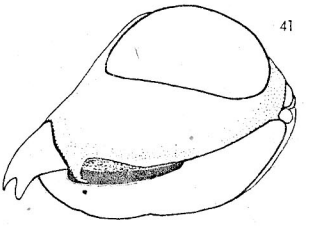
Figs. 27-36. 27, *Genaemirum vulcanicola* Heinrich, ♀, head (dorsal); 28, *Genaemirum mesoleucum* Heinrich, ♀, head (frontal); 29, same species, ♀, head (lateral); 30, *Genaemirum varianum* (Tosquinet), ♀, head (frontal); 31, same species, ♀, head (lateral); 32, *Genaemirum doryalidis* Heinrich, ♀, head (frontal); 33, same species, ♀, head (lateral); 34, *Genaemirum vulcanicola* Heinrich, ♀, propodeum; 35, *Chasmopygium carotifer* Heinrich, ♀, head (frontal); 36, same species, ♀, propodeum.











VI

Figs. 37-41. 37, *Aethiamblys auricomus* (Morley), ♀, propodeum; 38, *Liojoppa lucida* Szépligeti, ♀, propodeum; 39, same species, ♀, tergites 1-3; 40, *Afrocoelichneumon malagassus* (Saussure), ♀, propodeum; 41, *Liojoppa occidentalis* Heinrich, ♀, head (lateral).

II. *Tribe Ceratojoppini* Heinrich

Ceratojoppini Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 121

Type genus.—*Ceratojoppa* Cameron

Among the tribes of the subfamily Ichneumoniae, this one is morphologically the most peculiar and amazing. The structure of almost every part of the body of the nembers of this tribe is somehow different from the norm of the subfamily. This fact must logically raise some doubt about its taxonomic position, the more so, as some characters seem to indicate a relationship to the cryptines, or even to the ophionines. Nevertheless, I believe, that the tribe is better placed in the Ichneumoninae than in any of the other subfamilies. Observation of these insects in the field, particularly of the way they behave and move, seems to confirm this hypothesis.

The tribe is evidently confined to the Ethiopian region, and it comprises only one genus, *Ceratojoppa* Cameron. Previously only one species was known from the African continent and a second from Madagascar. Five further species will be added in this paper.

As the diagnosis of the tribe is identical with that of the only included genus it does not seem necessary to give a detailed description of structure here.

24. Genus *Ceratojoppa* Cameron

Figs. 42-46

Ceratojoppa Cameron, 1905, Zeitschr. f. Hym. u. Dipt., Heft 6, p. 346.

Type species.—*Ceratojoppa cornuta* Cameron

Ceratojoppa Heinrich, 1938, Mém. de l'Acad. Malg., XXV, pp. 121, 122; redescription of genus; figs.: pl. VI, fig. 48 (base of abdomen), fig. 49 (lateral view of abdomen).

Distribution

Tropical and subtropical Africa south to eastern Cape Province, and Madagascar.

Morphological characters

Flagellum.—Very long and slender; in females bristle-shaped, ventrally flattened beyond middle, and sometimes a trifle widened, dorsally flattened in the region of white annulus, basal segments enormously elongate, apex very long and sharply attenuated; of males not nodose except apex, with a row of extremely narrow, dash-shaped, almost imperceptible tyloids, reaching from before the white annulus to beyond it, the basal segments not apically truncate, but obliquely cut and overlapping each other.

Head.—Temple profile not or little narrowed behind eyes, strongly curved; eyes protruding; cheeks wide in lateral view and swollen; frons concave, in type species with 5 longitudinal carinae (fig. 45), a short median one below lower ocellus, two longer ones running from the inner part of the projecting antennal sockets upwards in nearly straight line to about middle of frons, and another pair starting on each side of frons below level of lower ocellus and converging toward middle of antennal concavity; these frontal carinae show specific variations in their degree of development and shape; in the following treatment of the species, the pair connected with the antennal sockets will be called "exterior frontal carinae", the other pair "converging frontal carinae"; the latter have a tendency to develop projections on their inferior part, the former are more or less prominent, so-

metimes subobsolete, sometimes bifurcate above; ocellar triangle somewhat raised and surrounded by a furrow; median field of face slightly convex; clypeus with oblique sides, rounded corners, straight apex and distinct foveae; labrum slightly projecting; mandibles short, wide, strongly curved, with deeply gaping teeth, the upper somewhat longer and slenderer than the lower; sculpture very fine, mostly alutaceous.

Thorax (fig. 42).—Median lobe of mesoscutum raised, with flattened anterior surface, the lateral lobes strongly depressed, their outer margins forming elevated rims, particularly toward apex; notauli extremely pronounced, forming throughout their length wide, shallow furrows, irregularly and coarsely transversely rugose; scutellum strongly raised above postscutellum, perpendicularly declivous and with high carinae laterally and sometimes also apically, dorsally flat or convex; propodeum with pronounced basal furrow; area basalis and areae superoexternae confluent into one usually smooth, transverse basal field, which is laterally and apically bordered by distinct carinae; carina metapleuralis also distinct; the rest of carination obsolete; propodeum from apical border of the smooth basal field gradually declivous toward apex, coarsely, irregularly reticulate-rugose; apex of areae dentiparae sometimes slightly indicated; posterior end of pronotal ridge with acute or obtuse (Madagascan species) projection.

Legs.—Fairly long; femora extremely slender, coxae relatively small, coxae III sometimes with distinct scopa.

Wings.—Clear, sometimes with apical infuscation; areolet quadrangular, sometimes even petiolate; nervullus interstitial; radius basally sinuate.

Abdomen.—First segment long and slender, postpetiole but little wider than petiole, without median field, more or less densely punctured, gastrocoeli forming elongate longitudinal lateral impressions, terminated by very large, widened thyridia; second tergite always considerably longer than apically wide, in the two species from Madagascar (fig. 43) base of third tergite with very distinct thyridia; sculpture of anterior tergites varying specifically from very densely punctured and subopaque to nearly alutaceous; apex of female abdomen oxypygous, with slightly projecting ovipositor, sometimes (species from Madagascar) compressed.

Key to the species and subspecies of *Ceratojoppa* Cameron
Females and Males

1. Mesoscutum and scutella bright yellow, with slight orange tinge. (Head black, with small whitish marks only on vertical orbits; abdomen black, with white anal mark on seventh tergite; tarsi III extensively white; length 15 mm.) ..... 4. *citriscuta*, new species, ♂
   East Tanganyika: Uluguru Mts.
   Mesoscutum and scutella uniformly or extensively ferruginous or red. 2
2. Abdomen predominantly or entirely ferruginous or light ochreous. 3
   Abdomen predominantly black, usually with fairly rich white pattern. 6
3. Tarsi III blackish, without white markings. (All frontal carinae very strongly developed, converging carinae with large, hornlike projections; white anal pattern restricted; length 13-16 mm.) 4
   Tarsi III extensively white. (Frontal carinae and hornlike projections less prominent than in alternative species; white anal pattern more conspicuous; length 12-17 mm.) 5
4. Mesoscutum and occipital region slightly olive-brownish-tinged; tibiae III dor-

sally fairly strongly infuscated. ..... 1a. *cornuta cornuta* Cameron, ♀♂
Natal, eastern Cape Province

Mesoscutum and occipital region without olive-brownish tinge, light ferruginous; tibiae III dorsally not blackish. .....
..... 1b. *cornuta aequatorialis*, new subspecies, ♀♂
Tanganyika

5. Large white patches on frontal orbits; apical tergites partially blackish-infuscated before white anal pattern; flagellar annulus of females on segments 8-16. ..... 2a. *idonea idonea* (Tosquinet), ♀♂
Togo

No white patches on frontal orbits; apical tergites not conspicuously infuscated before white anal pattern; flagellar annulus of females on segments 7-22.
..... 2b. *idonea angolica*, new subspecies, ♀
Northeastern Angola

6. Head black, except large white patches on frontal orbits; pronotum and anterior part of mesoscutum infuscated to black. (Areolet usually distinctly petiolate.) 7

Head and thorax red or orange-red, without black marks and distinct pure white pattern. 8

7. More than basal third of metatarsus III black, rest of tarsi III white; propodeum dorsally blackish-infuscated or black; converging frontal carinae with distinct projections; exterior frontal carinae rather prominent; tegulae with steeply declivous sides and front. (In female from Angola posterior end of pronotal ridge with a sharp, thornlike point; length 15-17 mm.)
..... 3. *insperata* (Tosquinet), ♀♂
Togo, Angola

Tarsi III uniformly snow-white, including entire metatarsus; propodeum uniformly red; converging frontal carinae without projections; exterior frontal carinae abbreviated and weak; tegulae almost flat. (Apex of abdomen of female compressed; length 13 mm.) ..... 7. *guineensis*, new species, ♀♂
Spanish Guinea

8. Apex of forewing with deeply infuscated cloud; coxae III of females with dense and distinct scopa; basal field of propodeum smooth; cheecks much more swollen than in alternative species. (Length 13-18 mm.) 5. *seyrigi* Heinrich, ♀♂
Madagascar

Forewings without infuscated cloud; coxae III of females without trace of scopa; basal field of propodeum distinctly rugose; cheeks less swollen than in alternative species. (Length 18-20 mm.) 6. *immaculata*, new species, ♀♂
Madagascar

1. *Ceratojoppa cornuta* Cameron

Figs. 42, 45

Distribution

Eastern Cape Province; Natal; southern Tanganyika: Mbeya; eastern Tanganyika: Lake Manyara and Morogoro.

Preamble

Chromatically distinguished by the predominantly light ferruginous basic color of the entire body and the absence of white on tarsi III; structurally by the strongly elevated converging frontal carinae (fig. 45), which form in their lower part hornlike projection (approximately triangular in lateral view), and also by the dorsally flattened and strongly circumcarinate scutellum. Populations from tropical East Africa show a slight subspecific difference in color of mesoscutum, occiput, and hind legs from South African populations.

Female

Light ferruginous (= pale ochreous), ocellar region and frons, except

lowest part, black; face, clypeus, cheeks and orbits, sterna, anterior coxae, and most of pleura whitish; in southern populations mesoscutum and occiput olive-brownish, tibiae and tarsi III blackish-infuscated; flagellum predominantly black, with complete white annulus; length 13.5-16 mm.

Flagellum.—With 40-42 segments, the first perhaps 8 or 9 times as long as wide, the widest less than twice as wide as long. Black, with complete white annulus on segments 8 (apex) or (usually) 9 to 15 or 16; segments before annulus narrowly pale at apex, the first segment ventrally extensively lighter-colored than dorsally; scape uniformly ferruginous.

Head.—All frontal carinae (fig. 45) strongly prominent, lower part of converging frontal carinae with strong hornlike projections, triangular in lateral view; sculpture of entire head nearly smooth, with a very few, scattered, fine punctures. White; ocellar region, upper part of frons, and mandible teeth, black; occipital region in southern populations slightly olive-brownish-tinged, in tropical populations pale ferruginous.

Thorax.—Structure as described for the genus (fig. 42); scutellum with very strongly elevated lateral carinae and less raised apical carina, dorsally flat, apically perpendicularly declivous; basal transverse carina of propodeum medially interrupted; carinae dentiparae exteriores slightly indicated; declivity very coarsely reticulate-rugose; metapleura partially transversely striate; mesopleura predominantly smooth. Pale ferruginous, pleura and sterna pale yellowish, almost whitish; mesoscutum in southern populations slightly olive-brownish-tinged.

Legs.—Coxae III polished, with few, scattered punctures, without scopa. Pale ferruginous; coxae and trochanters I and II whitish-yellow; tarsi III and dorsal side of tibiae III very slightly to blackish-infuscated—in geographical variation.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole densely punctured, tergites 2 and 3 subopaque, very densely rugose-punctate, the fourth tergite less densely punctured, particularly toward apex. Uniformly pale ferruginous; tergites 6 and 7 with narrow whitish apical bands; rarely the seventh tergite dorsally infuscated.

Male

As female; tarsi III blackish; last tergites without whitish apical pattern; length 13-15 mm.

Flagellum.—With very narrow, elongate tyloids on segments 10-25. Black, with complete white annulus on segments 14 (apex) to 22; scape uniformly light ferruginous.

1a. *Ceratojoppa cornuta cornuta* Cameron

Ceratojoppa cornuta Cameron, 1905, Zeitschr. Hym. Dipt., V, p. 246, ♂.
Ischnojoppa visibilis Morley, 1917, Ann. S. Afr. Mus., XVII, pp. 194, 195, ♀♂; new synonymy.

Types

Holotypes.—*Ceratojoppa cornuta* Cameron, ♂, Natal, S. Africa. B.M. No. 3b-11; *Ischnojoppa visibilis* Morley, ♀, Natal, Kranzkloof, labeled "type" by Morley. S.A.M.

Paratype.—*Ischnojoppa visibilis* Morley, ♂, Zululand, Mfongosi, labeled "androtype" by Morley. S.A.M.

Distribution

Natal (type locality); eastern Cape Province: East London (C.G.H. II).

Female and *Male*

A shade darker in color than aequatorialis *new subspecies; in particular, mesoscutum and occipital region slightly olive-brown-tinged and tibiae III dorsally fairly strongly infuscated, blackish.*

1b. *Ceratojoppa cornuta aequatorialis*, new subspecies

Types

Holotype.—♀, "Morogoro, Tanganyika, 1.I.1963. G. Heinrich". C.G.H. II.

Allotype.—♂, same locality, 5.I.1963. C.G.H. II.

Paratypes.—1 ♀, "S. W. Tanganyika, Mbeya, 21.XII.1962"; 1♂, "Tanganyika, W. of Lake Manyara, Escarpment, 6.VIII.1962". C.G.H. II.

Distribution

Tanganyika.

Female and *Male*

Lighter-colored than cornuta cornuta, *in particular mesoscutum and occipital region light ferruginous instead of olive-brownish-tinged; tibiae III dorsally not blackish.*

2. *Ceratojoppa idonea* (Tosquinet)

Distribution

West Africa: Togo and Angola.

Preamble

Related to *cornuta* Cameron and agreeing with it in the predominantly ferruginous color of the entire body, in sculpture and in the main structural characters. Differs from *cornuta* by the predominantly white tarsi III, the considerably less raised frontal carinae, and by the slightly more widened flagellum of females.

Female

Light ferruginous, head extensively to predominantly yellowish-white; sixth tergite with white apical margin or apical band, seventh with white anal mark; tarsi III white, except first and last segments; flagellum black or blackish, with complete white annulus; length 12-17 mm.

Flagellum.—With 36-44 segments, the widest 1.5 to 2 times as wide as long. Complete white annulus on segments 8 to 16 or to 22.

Head.—Structure and sculpture as in *cornuta*, but frontal carinae considerably less elevated. Ferruginous, with geographically varying white pattern.

Thorax.—Structure as in *cornuta*. Light ferruginous; sterna and mesopleura more or less extensively whitish.

Legs.—Coxae III polished, with scattered punctures, without distinct scopa. Ferruginous, apex of tibiae III and sometimes of femora III somewhat infuscated; tarsi III white, except partially or entirely black first and last segment, anterior coxae whitish.

Wings.—Clear; areolet quadrangular.

Abdomen.—Sculpture and structure as in *cornuta*. Ferruginous; sixth tergite with white apical margin or band, varying geographically in extent, seventh tergite with white anal mark, varying in size; both tergites sometimes black before white anal pattern.

2a. *Ceratojoppa idonea idonea* (Tosquinet), new combination

Hoplismenus idoneus Tosquinet, 1896, Mém. Soc. Ent. Belg., pp. 56-58, ♀.

Types

Holotype.—♀, "Togo, Hinterland, Kling." Z.M.H.U. No. 26324.
Allotype.—♂, same locality. Z.M.H.U. No. 26323.

Distribution

Togo (type locality).

Female

Large white patches on frontal orbits, reaching up to vertex; sixth tergite with fairly wide white apical band, the seventh with large white anal mark, both tergites black before white anal pattern; flagellum with white annulus on segments 8 (apex) to 16; length 12 mm.

Male

As female, but only seventh tergite with white anal pattern, apical tergites more extensively infuscated; tarsi II black; white flagellar annulus on segments 12-17 or 14-22; length 14 mm.

2b. *Ceratojoppa idonea angolica*, new subspecies

Types

Holotype.—♀, "Angola, Cacolo, 1300 m, 23. Dec. 1957-27. Jan. 1958." C.G.H. II.

Distribution

Northeastern Angola: Cacolo (type locality).

Female

No white patches on orbits, only lower half of frontal orbits indistinctly and narrowly whitish; apical margin of sixth tergite very narrowly witish, the seventh with medium-sized anal mark, neither tergite black before anal pattern; flagellum with white annulus on segments 7 (apex) to 22; length 17 mm.

Flagellum.—With 44 segments, the widest twice as wide as long. Black, with complete white annulus on segments 7 (apex) to 22, segments before annulus apically narrowly brownish; scape ferruginous.

Head.—Frontal carinae considerably less raised than in *cornuta*, hornlike triangular projections on inferior part of converging frontal carinae

present, but scarcely half as long as in *cornuta*. Ferruginous; body of mandibles, clypeus, face, apex of cheeks, and lower part of frontal orbits narrowly indistinctly whitish.

Thorax.—Light ferruginous; only sterna whitish.

Legs.—Ferruginous; tarsi III white, basal half of first and apical half of last segment black; tarsi II blackish; apex of tibiae III slightly infuscated.

Abdomen.—As described above.

3. *Ceratojoppa insperata* (Tosquinet), new combination

Figs. 44, 46

Platylabus insperatus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, pp. 108-110, ♂.

Types

Holotype.—♂, "Bismarckburg, Togoland, R. Büttner." Z.M.H.U. No. 26337.

Neallotype.—♀, "Angola, 30 km north of Quiculungo, Sept. 6th, 1957." C.G.H. II.

Distribution

West Africa: Togo (type locality); northwestern Angola: Quiculungo (C.G.H. II).

Preamble

Markedly different in color and also distinctly different in structure, from *cornuta* Cameron: temple profile more narrowed behind eyes, considerably less strongly curved; converging frontal carinae with much less pronounced toothlike elevation, exterior frontal carinae (in female from Angola) bifurcate (fig. 46); areolet distinctly petiolate.

So far, only two males from Togo, and one female from Angola are known. The association of these two sexes is obvious, but there is a small chromatic difference: the mesoscutum is entirely ferruginous and the femora III are dark red in the female, the anterior half of the former and the latter entirely black in the males. This difference may well represent the normal sexual dichroism, but could also indicate subspecific differentiation.

Male

Head black, with large, half-moon-shaped white patches on frontal orbits between eyes and ocelli; thorax ferruginous; pronotum, anterior half of mesoscutum, and dorsal surface of propodeum black; abdomen black, second, third, and sixth tergites with white apical margins, seventh tergite with large white anal mark; legs III black, including coxae, their tarsi white, except basal half of metatarsus; flagellum blackish-brown with white annulus; length 17 mm.

Flagellum.—With 39 segments. Complete white annulus on segments 13-18.

Head.—Smooth, with few, scattered punctures; temple profile somewhat narrowed behind eyes, slightly curved. Black: mandibles, except teeth and large half-moon-shaped patches on upper frontal orbits white.

Thorax.—Structure generally as in *cornuta*. Ferruginous; black are: pronotum, dorsal surface of propodeum, and anterior half of mesoscutum.

Legs.—Legs III black, their coxae apically red, their tarsi white, except basal half of metatarsus; coxae I and II predominantly, trochanters I and II ventrally, white; tibiae and tarsi I light ochreous, II brownish; femora I light ochreous, dorsally and ventrally brownish, femora II darker.

Abdomen.—Postpetiole medially sparsely, laterally more densely punctured; tergites 2 and 3 densely rugose-punctate, subopaque, the following tergites shiny and rather smooth. Black; apical margin of postpetiole reddish; tergites 2, 3, and 6 with yellowish-white apical bands, the seventh with anal mark.

Female

Description based on specimen from Angola. *Head black, with large half-moon-shaped white patches on frontal orbits between eyes and ocelli; thorax ferruginous, the pronotum predominantly blackish-infuscated, dorsal surface of propodeum black; abdomen black, tergites 1-3 and 6 with white apical bands, seventh tergite with large white anal mark, all tergites laterally whitish, apical margin of tergites 4 and 5 indistinctly whitish; legs III extensively black including coxae and trochanters, femora III predominantly dark red; tarsi III white, except less than the basal half of metatarsus; flagellum black, with complete white annulus; length 15 mm.*

Flagellum.—With 44 segments, the widest not quite twice as wide as long. Black, with complete white annulus on segments 9-17, segments before annulus apically narrowly brownish; scape predominantly black.

Head.—Color as in male.

Thorax.—Scutellum somewhat less raised, posterior thornlike projection on pronotal ridge (fig. 44) more pronounced than in *cornuta;* scutellum not apically carinate. Light ferruginous; pronotum and prosternum predominantly blackish-infuscated, dorsal surface of propodeum black.

Legs.—Coxae III ventrally polished, with few, scattered punctures, without scopa. Coxae and trochanters I and II whitish, dorsally partially blackish-infuscated; coxae and trochanters III black; femora I and II pale ferruginous, III dark ferruginous-red, apically infuscated; tibiae I and II and the tarsi I almost whitish on anterior side, infuscated on posterior; tarsi II blackish; tibiae III dorsally blackish-infuscated, ventrally pale; tarsi III white, except less than basal half of metatarsus, which is black.

Wings.—Clear; areolet very distinctly petiolate.

Abdomen.—Postpetiole laterally strongly and fairly sparsely punctured, medially almost smooth, with few, scattered punctures; second and third tergites densely rugose-punctate, subopaque; fourth tergite basally finely punctate, alutaceous toward apex—as are the following tergites. Black; tergites 1-3 and 6 with white apical bands, the seventh with large white anal mark, fourth and fifth with indistinctly whitish apical margins; all tergites laterally fairly extensively whitish.

Remark

In the female (neallotype) the posterior ends of pronotal ridges are drawn out into a sharp-pointed thorn, and the scutellum is not carinate apically; in the male (holotype) the posterior ends of pronotal ridges are only slightly projecting and less sharply pointed. Whether these differences are sexual or geographical remains to be investigated.

4. *Ceratojoppa citriscuta*, new species

Types

Holotype.—♂, "Tanganyika, Uluguru Mts., 1500-1800 m, 14.XII." C.G.H. II.

Distribution

Eastern Tanganyika: Uluguru Mts.

Preamble

Chromatically far away from all other species of this genus; possibly an endemic form of the Uluguru Mountains, which are so interesting zoogeographically, harboring not only two endemic species of birds, *Cinnyrus loveridgei* Hartert and *Malaconotus alius* Friedmann, but even an endemic genus, *Scepomycter winifredae* (Moreau).

Male

Black, including entire head and most of legs; mesoscutum, scutella, upper anterior part of mesopleura (between subalarum and apex of prepectus), and upper part of propleura, including pronotal ridge, bright yellow, with a slight orange tinge; seventh tergite with large white anal mark; tarsi III, except nearly basal half of metatarsus and apex of fifth segment, white; flagellum black including scape, with complete white annulus; length 15 mm.

Flagellum.—With 41 segments; dash-shaped tyloids on segments 14-22. Black, with complete white annulus on segments 16-23.

Head.—Frontal carinae well developed, except median carina which is obsolete; hornlike projections on lower part of converging frontal carinae almost as conspicuously raised as in *cornuta* Cameron; temple profile somewhat narrowed behind eyes, as in *insperata* Tosquinet; clypeus with distinct medio-apical impression; predominantly smooth with scattered punctures, face along sides of median field more densely punctured. Black, with small whitish marks on vertical orbits.

Thorax.—Scutellum strongly raised above postscutellum, fairly wide, not apically carinate and sloping down in a steep curve; posterior projections of pronotal ridge mediocre. Color as described above.

Legs.—Black; apical margins of trochanters partially, the ventro-anterior side of tibiae I and II and of metatarsi I whitish; tarsi III white, except nearly basal half of metatarsus and apex of fifth segment.

Wings.—Clear; areolet quadrangular.

Abdomen.—Postpetiole coarsely and fairly densely punctured; second tergite densely rugose-punctate, third tergite rather densely punctured to beyond middle, smooth toward apex; following tergites smooth and shiny. Black, seventh tergite with large white anal mark.

5. *Ceratojoppa seyrigi* Heinrich

Fig. 43

Ceratojoppa Seyrigi Heinrich, 1938, Mém. de l'Acad. Malg., XXV, pp. 122, 123, ♀♂, and pl. III, fig. 16: color picture of female.

Types

Holotype.—♀, "Madagascar, Sihanakawald, 800 m, IX.1931, leg. A. Seyrig." C.G.H. I.

Allotype.—♂, "Madagascar, Fanorana, V.1932, leg. A. Seyrig." C.G.H. II.

Distribution

Madagascar: Sihanaka Forest (type locality), Fanorana, Rogez (C.G. H. II), Ampandrandava (M.N.H.N.).

Preamble

This, and the following species differ from the four continental species treated under Nos. 1-4, by a reduction of the frontal carinae, by the distinctly compressed apex of female abdomen, by distinct thyridia on base of third tergite (fig. 43), and by the dorsally rather strongly convex and coarsely punctured scutellum; the converging frontal carinae bear no trace of hornlike projections and in this species are even obsolete in their upper part; the exterior frontal carinae are still more reduced and abbreviated in this, and also in the two following species.

Ceratojoppa seyrigi Heinrich is uniquely distinguished within the genus by two characters: 1. the strongly infuscated apical part of anterior wings, 2. a very distinct scopa on coxae III of females.

Female

Head and thorax uniformly red, without white markings; abdomen bluish-black, with conspicuous white apical bands on tergites 3-7; wings with deeply infuscated cloud behind areolet; legs III, except red coxae, predominantly black or blackish, legs I and II, including coxae, predominantly ferruginous; flagellum black with white annulus; length 13-18 mm.

Flagellum.—With 44 segments, the widest scarcely wider than long. Black, with complete white annulus on segments 8 or 9 to 15 or 16; scape red.

Head.—Median frontal carina and exterior frontal carinae obselete, or indicated at the very base only; converging frontal carinae obsolete above, distinct in the lower part, but without hornlike projections; temple profile wide, strongly curved; smooth, with a few, scattered punctures on clypeus and cheeks, face sparsely punctured. Uniformly red.

Thorax.—Posterior projection of pronotal ridge not pointed as in continental species, but rounded and fairly short; tegulae dorsally concave, dish-shaped; scutellum dorsally strongly convex and very coarsely and densely reticulate-rugose-punctate, not apically carinate, with rather steep, but not quite perpendicular, more or less distinctly longitudinally striate apical slope; about apical third of median lobe with very prominent, U-shaped, parallel rugae; basal field of propodeum smooth and shiny. Uniformly red.

Legs.—Coxae III strongly and moderately sparsely punctured, with conspicuous, dense scopa. Ferruginous are: all coxae, trochanters I and II and fenora I and II; black or blackish are: posterior side of tibiae I and II, tibiae III predominantly, all tarsi, trochanters III; tibiae I whitish on anterior side, tibiae II pale ferruginous; femora III dark ferruginous-red to blackish.

Wings.—Clear, their apex beyond areolet with deeply infuscated cloud; areolet more or less distinctly quadrangular.

Abdomen.—Postpetiole and second tergite polished, with sparse, strong punctures; third tergite finely and fairly sparsely punctured, the following tergites smooth; fourth and following tergites compressed. Bluish-black; tergites 3-7 with wide apical bands, usually also the very margin of first and second tergite, whitish.

Male

(Allotype). *As female, but segment 1 (apex) to 4 of tarsi III white; white flagellar annulus on segments 14-23; white apical band on third tergite reduced.*

6. *Ceratojoppa immaculata*, new species

Ceratojoppa Seyrigi, var. 1, Heinrich, 1938, Mém. de l'Acad. Malg., XXV, p. 123.

Types

Holotype.—♀, "Madagascar, Ivondro, V.40, A. Seyrig." M.N.H.N.
Allotype.—♂, same locality, XII.38. M.N.H.N.
Paratypes.—2 ♀♀, Maroantsotru (Vadon), XI.34; 1 ♀, 1 ♂, Rogez, I.37 and II.37; 3 ♂♂, Ivondro, XII.38 and V.40. M.N.H.N.; 2 ♀♀, 2 ♂♂, Ivondro, XII.38 and I.29. C.G.H. II.

Distribution

Madagascar: Ivondro, Rogez, Maroantsotru.

Preamble

In general appearance rather similar to *seyrigi* Heinrich; differing very distinctly as a species by the entire lack of scopa on coxae III of females, the longer and more strongly developed converging frontal carinae, the rather coarsely rugose (instead of smooth) basal field of propodeum, the presence of pronounced thyridia on base of third tergite and the entire lack of apical cloud on forewings; temples and cheeks less swollen than in *seyrigi.*

Female

Head and thorax uniformly red, without white markings; abdomen bluish-black, tergites 1-3 without bluish tinge and more or less extensively dirty-brownish or reddish-discolored; tergites 3-7 with conspicuous, medially moderately narrowed, white apical bands; wings clear, without apical infuscation; all coxae, trochanters, and femora ferruginous, tibiae and tarsi extensively infuscated; flagellum black, with complete white annulus; length 18-20 mm.

Flagellum.—With 46 or 47 segments, the widest almost twice as wide as long. Black, the basal segments more or less extensively brownish-tinged, with complete white annulus on segments 7 or 8 to 15 or 16; scape red.

Head.—Temple profile slightly narrowed behind eyes, strongly curved; cheeks less swollen than in *seyrigi;* converging frontal carinae more developed and longer, reaching above to almost level with lower ocellus; occipital carina lamelliform; sculpture smooth, with very sparse punctures, face somewhat more densely punctured. Red; body of mandibles, clypeus, apex of cheeks, and face partially indistinctly yellowish-tinged.

Thorax.—Posterior part of median lobe of mesoscutum rather strongly convex and protruding above the posterior part of mesoscutum and the lateral lobes; scutellum as in *seyrigi:* dorsally strongly convex and coarsely rugose-punctate, not apically carinate; sometimes, however, a low apical carina indicated; basal field of propodeum, in contrast to *seyrigi,* not smooth, but irregularly rugose; posterior projection of pronotal ridge short and blunt; tegulae dorsally deeply concave, dish-shaped. Uniformly ferruginous, sterna slightly yellowish tinged.

Legs.—Coxae III ventrally polished, sparsely and strongly punctured, without scopa. Ferruginous, including all coxae and trochanters; tarsi I and II moderately, tarsi III blackish-infuscated; tibiae I and II only slightly infuscated, ivory on anterior and ventral side; tibiae III dorsally blackish, ventrally pale ferruginous.

Wings.—Clear; areolet more or less distinctly quadrangular.

Abdomen.—Postpetiole sparsely and strongly punctured; second tergite sparsely and moderately strongly, the third finely punctured, all polished, the following tergites smooth; third tergite bears at base very distinct, large, transverse, finely coriaceous thyridia; fourth and following tergites compressed. Black, the basal three tergites more or less extensively brownish- or reddish-discolored, the following tergites bluish-tinged; tergites 3-7 with wide, medially narrowed, white apical bands; second tergite often with minute medio-apical white spot.

Male

As female, but segment 2, or apex of 2 to 4, or 3 and 4 only, of tarsi III white; white flagellar annulus on segments 12 or 13 to 23 or 24; length 18-20 mm.

Flagellum.—With dash-shaped tyloids on segments 6 or 7 to 22 or 23.

Remark

A. Seyrig had already recognized this species as new and different from *seyrigi;* the name "*immaculata*" is derived from the type label he had written and attached to the intended type specimen.

7. *Ceratojoppa guineensis,* new species

Types

Holotype.—♀, "Westafrika, Uelleburg, VI.-VIII.08, Tessmann S. G." Z.M.H.U.

Allotype.—♂, "Span. Guinea, Nkolentangan, XI.07-V.08, G. Tessmann S. G." C.G.H. II.

Distribution

Spanish Guinea.

Preamble

Chromatically extremely similar to *insperata* (Tosquinet), but smaller and slenderer and distinguished by uniformly snow-white tarsi III, entirely red propodeum, the much less developed frontal carinae and the compressed apex of the abdomen of females; in the latter structural characters closely related to the preceding two species from Madagascar.

Female

Head black with large white patches on frontal orbits; thorax orange-red, the prothorax, prosternum, and anterior part of mesoscutum blackish-infuscated; abdomen dorsally black, tergites 6 and 7 with white anal marks, tergites 1-3 with whitish apical and lateral margins; legs, including coxae, orange-red, the tarsi III uniformly snow-white, femora and tibiae III partially infuscated; length 13 mm.

Flagellum.—Broken; scape and basal five segments blackish-brown.

Head.—Median frontal carina obsolete; exterior frontal carinae only recognizable at antennal bases; converging frontal carinae weak and short, without projections; temple profile distinctly narrowed behind eyes, nearly straight; cheek profile moderately curved; smooth and impunctate. Black; large white half-moon-shaped patches on frontal orbits, reaching up to vertex and down close to antennal bases.

Thorax.—Posterior projections of pronotal ridges not pointed, but short and blunt; scutellum dorsally almost flat, strongly and sparsely punctured, laterally, but not apically, carinate; tegulae almost flat, laterally and apically only slightly sloping; basal field of propodeum smooth and shiny. Orange-red; the following blackish-infuscated: prosternum except apex, pronotum, anterior part of mesoscutum.

Legs.—Orange-red; tarsi III snow-white; the following infuscated: femora III and tibiae III dorsally, apex of tibiae III, tarsi II, tarsi I slightly.

Wings.—Clear; areolet petiolate.

Abdomen.—From apex of fourth tergite on distinctly compressed; postpetiole and second and third tergites strongly and densely punctured. Tergites black, the sixth and seventh with white anal marks; petiole pale orange; tergites 1-3 apically and laterally narrowly reddish-whitish, the third also basally.

Male

White anal mark on sixth tergite considerably reduced, the length of white frontal patches slightly; otherwise like the female.

Flagellum.—Apices broken; with a row of very long and narrow, dash-shaped tyloids on segments 9 to 26, the first three and last five shorter than the rest, almost oval. Black, with complete white annulus on segments 13-22; scape black.

III. *Tribe Ischnojoppini* Heinrich

Ischnojoppini Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 117.

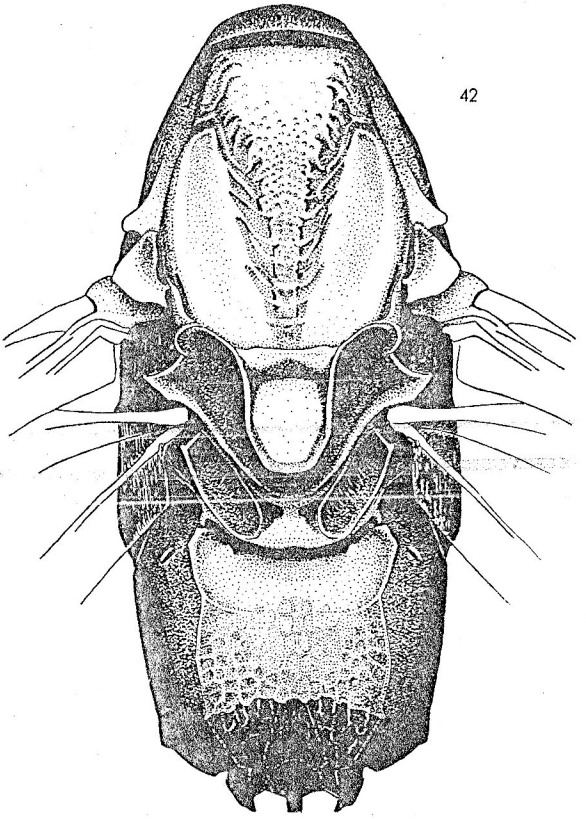
Type genus.—*Ischnojoppa* Kriechbaumer

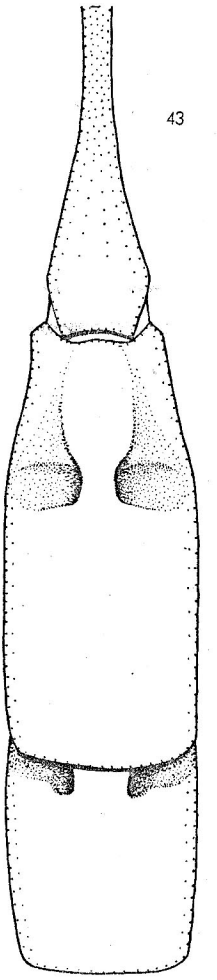
Distribution

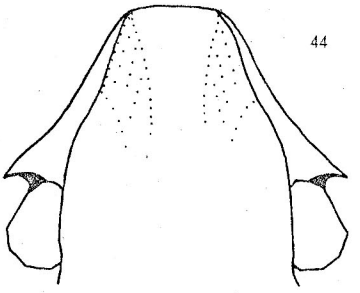
Mainly Ethiopian region, including Madagascar; only one species known from the Oriental region (including Indomalaya).

Host

Unknown; morphology, as well as ecology of all species of this tribe suggest cryptophagous, probably stem-boring larvae of some Lepidoptera Heterocera as the possible hosts.

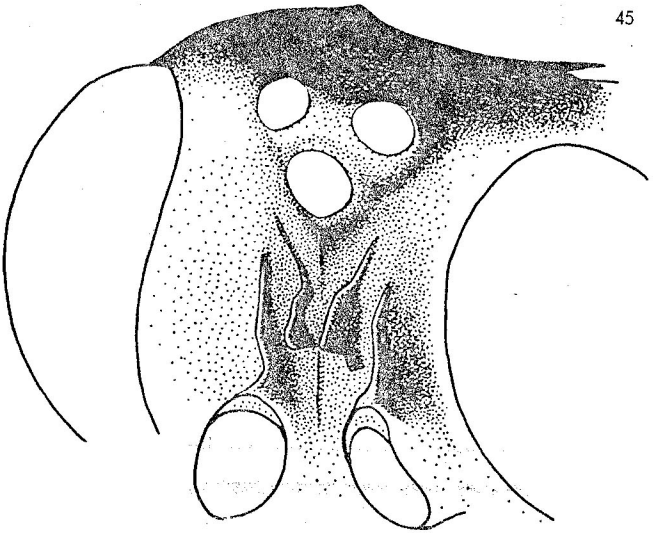


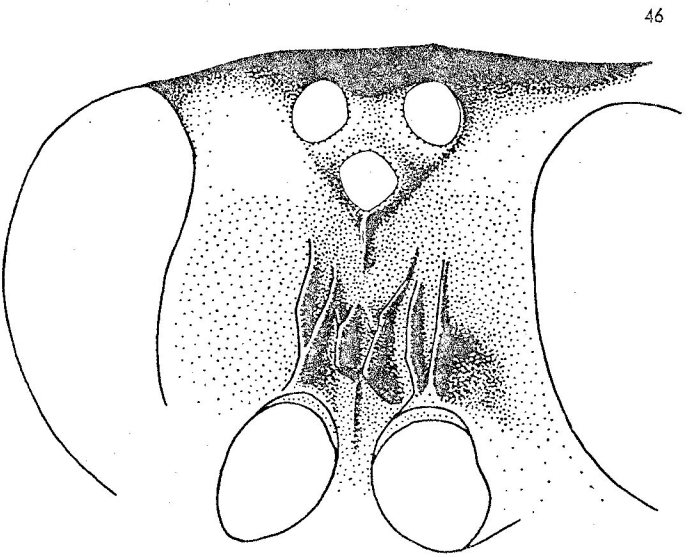




VII

Figs. 42-44. 42, *Ceratojoppa cornuta* Cameron, ♀, thorax; 43, *Ceratojoppa seyrigi* Heinrich, ♀, tergites 1-3; 44, *Ceratojoppa insperata* (Tosquinet), ♀, pronotal ridge.





VIII

Figs. 45-46. 45, *Ceratojoppa cornuta* Cameron, ♀, frons with carination; 46, *Ceratojoppa insperata* (Tosquinet), ♀, frons with carination.

Preamble

The head and mandible structure of this tribe is almost identical with that of the Listrodromini. I suppose that this is a case of convergency rather than a sign of relationship. All Ischnojoppini are distinguished in appearance by their graceful, slender and elongate body. They differ from the Listrodromini structurally by the propodeum which in the type genus is long, nearly cylindrical, with the declivity conspicuously shorter than the horizontal part (usually about half as long) and with the area superomedia, if recognizable, several times longer than wide, and in addition by the structure of the flagellum in both sexes (see below). In *Pseudischnojoppa,* new genus, the propodeum is shorter, the area superomedia only slightly longer than wide. Chromatically, the Ischnojoppini show no similarity to the Listrodromini.

Morphological characters

Flagellum.—Of females moderately long, bristle-shaped, lanceolate, ventrally extensively and clearly flattened beyond middle and usually distinctly to considerably widened, sharply attenuated at apex; of males nodose, with distinct, transverse bristle-ridges and with a long row of rather unobtrusive or indistinct tyloids.

Head (fig. 47).—Very similar to Listrodromini: face, clypeus, and malar space forming together one continuous, slightly convex plane, not interrupted by distinct sutures, depressions, or elevations; malar space long, at least as long as width of mandible base, in the genus *Ischnojoppa* much longer, sometimes twice as long; temples wide, their profile not narrowed behind eyes, occiput deeply emarginate, cheeks in lateral view unusually wide, as compared with width of eyes which are comparatively small and not protruding; mandibles short and wide, with subequal teeth, separated by a wide gap.

Thorax.—Mesoscutum somewhat longer than medially wide; basal fifth of notauli usually fairly distinct or at least indicated; scutellum strongly raised above postscutellum, fairly short and apically rounded, dorsally strongly convex, laterally with high carinae, apically steeply delivous; propodeum (fig. 48) elongate, the declivity much shorter than horizontal part, usually about half as long, slightly longer than horizontal part only in *Pseudischnojoppa,* new genus; areolation usually rather indistinct or partially obsolete; area superomedia, if distinguishable, much longer than wide, confluent with area basalis and gradually narrowed toward apex; in *Pseudischnojoppa* carination complete.

Legs.—Fairly slender, moderately long; coxae III of females sometimes with indistinct scopa; apex of tibiae III in one species slightly projecting dorsally (fig. 55).

Wings.—Areolet pentagonal, though strongly narrowed in front; radius nearly straight; nervulus usually interstitial, in some species strongly postfurcal.

Abdomen.—Narrow, parallel-sided, elongate (figs. 52, 53); postpetiole well separated from petiole, the median field convex, but laterally not clearly defined, rugose-punctate, sometimes more or less distinctly longitudinally striate; gastrocoeli rather deep, with approximately quadrangular outline, with distinct thyridia, space between aciculate; tergites 2-5

distinctly longer than wide, densely sculptured and subopaque; apex in females usually acute, oxypygous, with slightly projecting ovipositor; in one new species (fig. 56) blunt, semiamblypygous, with truncate last tergite and hidden ovipositor; hypopygium of males fairly short, apically broadly and bluntly rounded.

Chromatic characters

Rather monotonous; basic color in all known species light ferruginous or yellowish, sometimes with restricted white anal pattern; apices of femora and tibiae III in type species of *Ischnojoppa* and in several African species black; flagellum of females always, of males sometimes with white annulus.

Key to the genera of the *Ischnojoppini* Heinrich

1. Propodeum (fig. 48) elongate, the declivity much shorter than horizontal part, usually only about half as long; collare usually with backward bent lamella, where the lamella is indistinct, there is an excavation on the posterior side under the middle of the collare. ..... 25. *Ischnojoppa* Kriechbaumer

Propodeum (fig. 51) shorter, its declivity distinctly longer than horizontal part medially; collare without lamella and without median excavation on posterior side, instead the slight furrow behind collare medially interrupted by a small convexity. ..... 26. *Pseudischnojoppa*, new genus

25. Genus *Ischnojoppa* Kriechbaumer

Figs. 47-49 and 53-56

Ischnojoppa Kriechbaumer, 1898, Entom. Nachr., XXIV, p. 32.

Ischnojoppa Szépligeti, 1910, Sjöstedt's Kilim.-Meru Exped., VIII, pp. 65/66; key to 5 species.

Ischnojoppa Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, pp. 117-120; revisional notes on the species of the genus; key to 7 species.

Type species.—*Ichneumon luteator* Fabricius, monobasic.

Morphological and chromatic characters

The description given above for the tribe covers the characters of this genus. The collare, in most species, has a backward bent lamella which laterally reaches usually to the base of epomia and which has often a small median notch; in two species this lamella is medially rather deeply incised (fig. 49); in two others (*melanopyga* Holmgren and *similis* Szépligeti) the lamella is almost lacking and only slightly indicated in the middle of the collare.

Variability

All *Ischnojoppa* species are chromatically monotonous, showing amazing degree of similarity in color. The sexual dichroism is relatively small. Individual, as well as geographical variability are inconspicuous, in spite of the wide, often transcontinental, distribution of most of the species.

Zoogeographical and ecological remark

Only one species of this genus seems to occur in the Oriental region — the type species. From Africa, seven further species are known, a parallel to the distributional pattern of the subtribe Apatetorina of the Protichneumonini, and also of the tribe Compsophorini.

In contrast to the two latter groups, the genus *Ischnojoppa* is not found in humid tropical forests; it is part of the Ethiopian grassland fauna, confined to open and more or less dry habitats, savannah woods and edges of forests.

Key to the species of *Ischnojoppa* Kriechbaumer
Females and Males

1. Legs III without black markings. (Abdomen without white anal marks; coxae III of females with weak scopa.) 2
   Legs III with black markings. (Abdomen often with white anal marks; coxae III of females without scopa.) 3
2. Head predominantly to entirely black. (Tergites 5-7 black; length 12-15 mm.) ..... 2. *melanopyga* (Holmgren), ♀♂ Southern Cape Province
   Head without black, except in males ocellar region and part of frons, and in females sometimes ocellar region. (Tergites 5 or 6 to 7 black; length 11-16 mm.) ..... 4. *similis* Szépligeti, ♀♂ Cape Province to Kenya and Angola
3. Tibiae and tarsi III uniformly black or blackish. (Lamella of collare with moderate median incision; females with two, males with one anal mark; length 14-16 mm.) ..... 6. *madagascariensis* Heinrich, ♀♂ Madagascar
   Tibiae III only basally and apically, tarsi III usually only partially, black — if at all. 4
4. Lamella of collare with distinct median incision (fig. 49). (Seventh tergite in both sexes with white anal mark, flagellum in both sexes with dorsal white annulus; length 13-16 mm.) ..... 1. *flavipennis* (Brullé), ♀♂ Tropical and subtropical West and East Africa
   Lamella of collare without median incision. 5
5. Apex of abdomen of female semiamblypygous (fig. 56), the seventh tergite apically broadly truncate, ovipositor concealed; seventh tergite of females black, with white apical margin. (Nervulus interstitial; length 15 mm.) ..... 7. *diversapex*, new species, ♀ Southern Tanganyika
   Apex of abdomen of female sharply oxypygous (fig. 53), seventh tergite not truncate, ovipositor projecting; seventh tergite either entirely black or with white anal mark. 6
6. ♀♀. 7
   ♂♂. 8
7. Seventh tergite with white anal mark; tibiae III distinctly ascending dorsally at apex, the tip, seen in lateral view, forming a hump (fig. 55); first trochanters of legs III with small ventral projection on inner rim; nervulus very strongly postfurcal. (Length 14-16 mm.) ..... 5. *seyrigi* Heinrich, ♀ Madagascar, Tanganyika, Angola
   Seventh tergite without white markings; tibiae III dorso-apically, and inner rim of coxae III on ventral side normal and straight, without humps; nervulus interstitial or moderately postfurcal. (Tergites 5, or 6 to 7 black; length 14-15 mm.) ..... 3. *geniculata* (Tosquinet), ♀ Cape Province to northern Tanganyika
8. Coxae III ventrally on inner rim with small elevation; tibiae III dorsally at tip slightly raised; nervulus very strongly postfurcal. (Flagellum only exceptionally with annulus; only seventh tergite infuscated, exceptionally with white dot; length 14-16 mm.) ..... 5. *seyrigi* Heinrich, ♂ Madagascar, Tanganyika, Angola
   Inner rim of coxae III on ventral side and tibiae III dorso-apically completely straight; nervulus moderately postfurcal. (Flagellum usually with annulus; seventh tergite, and usually part, or most, of sixth black, the former never white-marked; length 13-15 mm.) ..... 3. *geniculata* (Tosquinet), ♂ Cape Province to northern Tanganyika

1. *Ischnojoppa flavipennis* (Brullé)

Figs. 47-49 and 53-54

Joppa flavipennis Brullé, 1846, in Lepeletier, Hist. Nat. Ins. Hym., IV, p. 278, ♀.
Microjoppa flavipennis Berthoumieu, 1904, Gen. Ins., XVIII, p. 10, ♀.
Ischnojoppa flavipennis Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, pp. 119 and 120, ♀.

Types

Holotype.—♀, Senegal, Coll. M. Serville. Not located. The Keeper of the Museum in Turin informed me that there was no type of a species *flavipennis* Brullé in the Serville collection.

Distribution

Evidently found throughout tropical and subtropical Africa. Recorded so far from: Senegal (type locality), Togo (Z.M.H.U.), northeastern Tanganyika: Eastern Usambara Mts. and Uluguru Mts. (C.G.H. II.), southern Tanganyika: Mbeya (C.G.H. II.), northeastern Angola: Province of Lunda (C.G.H. II.), northwestern Angola: south of the Cuanza river (C.G.H. II.), Northern Rhodesia (National Museum, Bulawayo), Kenya: Mombasa (C.G.H. I.).

Preamble

Although the type is not available for examination, the species described below may without hesitation be considered to match the original description of *flavipennis* Brullé. One of the most common and most widely distributed of the African species of this genus. By the combination of white anal pattern with black marks on legs III, it is chromatically convergent with the Oriental type species, which does not occur in Africa. All records of the latter from the Ethiopian region have, most probably, originated from misidentification of this species.

Easily recognized in both sexes by a deep median incision on the lamella of the collare (fig. 49), an excellent character for distinguishing this species from the Oriental *luteator* and from all other continental Ethiopian species. Further distinctive characters of the species are: 1. the extremely wide cheeks (in lateral view); 2. the very strongly elevated scutellum with very high lateral carinae; 3. the extremely strongly widened flagellum of females.

The only known species sharing the median incision of the lamella of the collare with *flavipennis* is *madagascariensis* Heinrich from Madagascar, distinguished by the uniformly black or blackish tibiae and tarsi III and two white anal marks in female.

Female

Pale yellowish-ferruginous; apicès of femora III and of tibiae III and the base of tibiae III narrowly black; the tarsi III brownish, usually slightly infuscated toward apex, varying to entirely blackish in some populations from tropical West Africa; seventh tergite black, with longitudinal white anal mark, the sixth tergite—at least apically—often entirely black, rarely (in western populations) also apex of fifth tergite black; flagellum basally brownish or ferruginous, with dorsal white annulus, apically black; length 13-16 mm.

Flagellum.—With 40-43, usually 42 segments, the first fully 4 times as long as wide, about the 9th square, the widest 2.5-3 times as wide as long. Segments 1-5 brownish or ferruginous; dorsal white annulus on segments 7 (apex) or 8 to 12 or (usually) 13; apex black; scape pale ferruginous.

Head.—Temples wide, temple profile rather long, slightly curved, not narrowed behind eyes; occiput deeply emarginate; cheeks in lateral view very wide; malar space nearly twice as long as width of mandible base. Pale ferruginous, without black markings, except teeth of mandibles; face, clypeus, and lower cheeks more yellowish-tinged.

Thorax.—Basal fifth of notauli indicated; scutellum strongly elevated above postscutellum, dorsally very strongly convex, the lateral carinae conspicuously raised, lamelliform; area superomedia (fig. 48) confluent with area basalis, usually fairly distinct, very long, slightly constricted at base of area basalis, then gradually narrowed toward apex; collare raised, forming a high, slightly backward-bent lamella bearing in the middle a deep incision. Uniformly pale yellowish-ferruginous.

Legs.—Coxae III without trace of scopa. Yellowish-ferruginous; the following black: apex of femora and tibiae III, base of tibiae III narrowly; tarsi III brownish, some of the apical segments usually more or less infuscated; in western populations tarsi III dorsally often entirely blackish-infuscated.

Wings.—Nervulus slightly to distinctly postfurcal; almost clear.

Abdomen.—Structure as described for genus (fig. 53); the eighth tergite usually visible and ovipositor slightly projecting. Yellowish-ferruginous, sixth tergite apically or sometimes entirely and tergites 7 and 8, rarely also apex of fifth tergite black, seventh and eighth with longitudinal, medio-apical white mark.

Male

Generally as female; sterna, pleura, face, clypeus, and lower cheeks yellow; black on apices of femora and of tibiae III and on base of tibiae III more restricted—on the average; seventh tergite black, with white anal mark, rarely (in Togo) also apical part of sixth tergite black; ocellar region sometimes slightly infuscated, rarely black; flagellum ferruginous with dorsal white annulus, apically blackish; length 13-16 mm.

Flagellum.—With 40-45 segments; short, bacilliform tyloids on approximately segments 8-20, the longest not covering more than about median third of segments, all inconspicuous and hard to recognize. Ferruginous, with dorsal white annulus on segments 12 or 13 or (usually) 14 to 19 or even 22; apex and a few segments before annulus dorsally blackish.

2. *Ischnojoppa melanopyga* (Holmgren)

Ischnus melanopygus Holmgren, 1868, Konigl. Svenska Fregat. Eug., Zoologi VI, p. 396, ♀♂.

Ischnojoppa melanopyga Roman, 1910, Ent. Tidskr., XXXI, p. 172 (transferred to genus *Ischnojoppa* Kriechbaumer).

Ischnojoppa extremitas Morley, 1916, Ann. S. Afr. Mus., XV, p. 358, ♂, new synonymy.

Types

Lectotype.—*Ischnus melanopygus* Holmgren, ♀, "Cape B. Spei, Victorin"; designated by G. Heinrich, 1964. N.R.

Paratypes.—1 ♀, 1♂, same locality. N.R.

Holotype.—*Ischnojoppa extremitas* Morley, ♂, "South Africa". S.A.M.

Distribution

Cape of Good Hope (type locality); southernmost part of South Africa. Rather common around the foot of Table Mountain, near Cape Town.

Preamble

The species is uniquely distinguished in color within the genus, in both sexes, by the predominantly or entirely black head and black apical tergites, and by the lack of white anal pattern and of black on legs III.

Female

Light ferruginous-yellow; head predominantly or entirely and tergites 5-7 uniformly black; legs III without black; flagellum tricolored; length 12-14 mm.

Flagellum.—With 37-39 segments, the first about 4 times as long as wide, the 11th square, the widest fully 1.5 times as wide as long. Tricolored: the first 6 or 7 segments ferruginous, becoming blackish before dorsal white annulus covering segments 8 (apex) to 13 or 14; black beyond annulus.

Head.—Structure as described for tribe; face, frons, vertex, and occiput strongly and densely, clypeus and cheeks less densely punctured; malar space about 1.5 times as long as width of mandible base. Black; mandibles except teeth and sometimes basal mark, apical margin of cheeks and clypeus, sometimes entire margin around clypeus more or less extensively yellowish or pale ferruginous.

Thorax.—Structure as described for tribe; basal fifth of notauli fairly distinct; scutellum rather strongly raised above postscutellum and dorsally strongly convex. Uniformly yellowish-ferruginous.

Legs.—Coxae III with fairly distinct scopa. Uniformly pale ferruginous, the tarsi III brownish.

Wings.—Nervulus interstitial; clear.

Abdomen.—Structure as described for tribe; sharply oxypygous. Yellowish-ferruginous; tergites 5-7 black.

Male

Generally as female; clypeus, on the average, apically more extensively yellowish, usually also laterally and basally; sometimes predominantly yellow; flagellum not tricolored, but black, with dorsal white stripe, instead of annulus; length 12-15 mm.

Flagellum.—With 36-40 segments; bacilliform tyloids on segments 6 to 26 or 27. Black, with dorsal white stripe on segments 14 or 15 or 16 to 19 or 20 (rarely white stripe subobsolete), ventrally usually dull brownish toward base; scape black, ventrally yellow.

3. *Ischnojoppa geniculata* (Tosquinet), new combination

Ischnus geniculatus Tosquinet, 1896, Mém. Soc. Ent. Belg., V, pp. 117-119, ♂♀.

Types

Lectotype.—♀, "Capland, Krebs". Z.M.H.U. No. 9085.
Paratypes.—2 ♀♀, 5♂♂, same locality. Z.M.H.U.

Distribution

Eastern Cape Province, region of Grahamstown (type locality); southern Cape Province, near Cape Town (C.G.H. II.); southern Tanganyika: Livingstone Mts. and Mbeya (C.G.H. II.); northern Tanganyika: West Usambara Mts. 2100 m (C.G.H. II.), East Usambara Mts., Amani (Z.M.H.U.).

Preamble

Shares with *flavipennis* Brullé and with *seyrigi* Heinrich the black-tipped femora and tibiae III and the black basic color of apex of abdomen. Females differ from both these species by complete lack of white anal pattern. Both sexes differ structurally from *flavipennis* by lack of the median incision in lamella of collare, from *seyrigi* by lack of the apical hump on tibiae III.

Female

Yellowish-ferruginous; black are: ocellar region, apex of femora III and of tibiae III fairly broadly, base of tibiae III narrowly, tergites 5 (entirely or apically) to 7, exceptionally only 6 and 7; flagellum tricolored: base ferruginous, apex black, middle with dorsal white annulus; length 14-15 mm.

Flagellum.—With 40-41 segments, the first fully 4 times as long as wide, about the 9th square, the widest 2.5 times as wide as long. Basal 5-7 segments usually ferruginous, rarely dorsally blackish and only ventrally ferruginous; dorsal white annulus on segments 9 or 10 to 12 or 13; apex black; scape orange, ventrally yellow.

Head.—Temples wide and, in contrast to *flavipennis* Brullé, distinctly swollen; temple profile similar to *flavipennis:* fairly long and slightly curved, not narrowed behind eyes; cheeks, in lateral view, rather wide; malar space about 1.5 times as long as width of mandible base. Orange; ocellar triangle black; clypeus, mandibles except black teeth, and usually also face and cheeks yellow-tinged.

Thorax.—Structure as in *flavipennis.* Yellowish, dorsally more or less orange-tinged.

Legs.—Coxae III without scopa; apex of tibiae III without hump. Pale orange, coxae and trochanters yellow; apex of femora III and of tibiae III broadly, base of tibiae III narrowly black; tarsi III brown, usually medially infuscated.

Wings.—Nervulus more or less distinctly postfurcal, sometimes interstitial; almost clear.

Abdomen.—At least tergites 6 and 7, usually also the 5th tergite except base, black; the rest yellowish-ferruginous or orange; anterior tergites often yellow.

Male

Generally as female; yellowish-ferruginous; the following black: ocellar triangle with adjacent part of frons down to antennal depressions, apex of femora III and of tibiae III broadly, base of tibiae III narrowly, tergites 6 and 7, the sixth tergite usually basally more or less extensively, rarely predominantly, ferruginous; flagellum dorsally infuscated, ventrally ferruginous, with narrow dorsal white annulus which is often reduced, seldom entirely obsolete; length 13-15 mm.

Flagellum.—With 40-41 segments; bacilliform, rather indistinct tyloids on approximately the segments 7-18. Dorsally more or less distinctly brownish infuscated, ventrally pale ferruginous, usually with narrow dorsal white annulus on segments 15 or 16 to 18 or 19, tending to be reduced to a row of white spots and sometimes, particularly in populations from Cape Town, indistinct or even entirely lacking; scape dorsally orange, ventrally yellow.

4. *Ischnojoppa similis* Szépligeti

Ischnus melanopygus var. 1. Holmgren, 1868, Konigl. Svenska Freg. Eug., Zool. VI, p. 396, ♂.

Ischnojoppa similis Szépligeti, 1910, Sjöstedt's Kilim.-Meru Exped., VIII, p. 65, ♀.

Ischnojoppa dubia Szépligeti, 1910, loc. cit., p. 65, ♂; (nec ♀, as stated in original description, but correctly altered, loc. cit. in key).

Ischnojoppa similis Heinrich, 1935, Mission Scientif. de l'Omo, III, p. 244, ♀♂; (Mt. Elgon, Kenya, 2470 m; *Ischnojoppa dubia* Szépligeti as synonym).

Types

Holotypes.—*Ischnojoppa similis* Szépligeti, ♀, "Kilimandjaro, Sjöstedt, 1905-6, Kibonoto Kulturzone, 23.IV." N.R.; *Ischnojoppa dubia* Szépligeti, ♂, same locality, "9. Mai". N.R.

Distribution

Northern Tanganyika: Kilimanjaro (type locality); Kenya: Mt. Elgon, 2470 m (Heinrich, loc. cit.); northern and eastern Tanganyika: Mt. Meru, 1800 m, Uluguru Mts., 1800 m and W. Usambara Mts. 2100 m (C.G.H. II.); southern Tanganyika: Mt. Rungwe, 2600 m, Dabaga, 2100 m, Mbeya, 2000 m (C.G.H. II.); Cape Province: East London (C.G.H. II.); northwestern Angola: north and south of the Cuanza River.

This species is evidently distributed over the entire African continent south of the Sahara, inhabiting the higher elevations around and above 2000 m in the tropical belt, and the lowlands in the Temperate Zone, a distributional pattern typical of so many African species.

Preamble

The most gracile of all species of the genus. Besides *melanopyga* Holmgren, the only one without black on legs III. Females share with *melanopyga* the presence of a weak scopa on coxae III. Differs from the latter species by the normal, light color of the head and by slenderer general appearance.

The extent of the black color on the apex of abdomen in this species varies geographically, and to a minor degree also individually. Populations from Mt. Kilimanjaro, Mt. Meru, and Mt. Elgon have tergites 5-7 black, South African populations only tergites 6-7. In some mountain ran-

ges, in the vicinity of Mt. Kilimanjaro, in the Western Usambaras, and the Uluguru Mts., the extent of the black abdominal color is more or less restricted, just as in South African populations, whereas in southern Tanganyika, Mt. Rungwe, another population with extensive black on abdomen occurs, — surrounded by populations with restricted black color. With regard to these interdigitations and intergradations, there is a choice of naming either a separate subspecies from almost every mountain range or none at all. I prefer the latter alternative.

Female

Orange, head and thorax ventrally and laterally yellowish-tinged; legs III without black; tergites 5 or 6 to 7 black; no white anal pattern; flagellum black with dorsal white annulus; segments before annulus either entirely or apically narrowly and ventrally entirely ferruginous; length 11-16 mm.

Flagellum.—With usually 37 or 38, sometimes up to 41 segments, the first about 4.5 times as long as wide, the 11th square, the widest from 1.5 times to twice as wide as long. Black, with dorsal white annulus on segments 8 or 9 to 13 or 14, the segments before annulus apically narrowly and ventrally entirely ferruginous, segments 1-5 sometimes uniformly ferruginous; scape ferruginous.

Head.—Temples wide, slightly swollen; temple profile fairly long and slightly curved, not narrowed behind eyes; malar space about 1.5 times as long as width of mandible base; cheeks rather wide in lateral view. Orange; ocellar region sometimes infuscated; the following yellowish-tinged: mandibles except teeth, clypeus, face, frontal orbits, lower part of cheeks.

Thorax.—Structure as in *flavipennis* Brullé. Predominantly yellowish, mesoscutum slightly orange-tinged.

Legs.—Coxae III with weak scopa. Light orange; tarsi III a shade darker.

Wings.—Nervulus interstitial to slightly postfurcal; almost clear.

Abdomen.—Light orange basally, becoming slightly darker toward the fourth tergite; fifth tergite apically to entirely, sixth and seventh entirely black.

Male

Generally as female; light orange; the following black: ocellar triangle and immediately surrounding area, frons below ocelli down almost to antennal sockets (except frontal orbits), tergites 6 and 7, the fifth tergite apically or entirely; flagellum black, in typical populations with restricted, or without, in southern populations with rather wide, dorsal white annulus; length 12-15 mm.

Flagellum.—With 36-40, usually 37 or 38 segments; inconspicuous narrow tyloids on segments 7 or 8 to 20 and beyond. Black, both ventrally and dorsally; in populations from Mt. Kilimanjaro and Mt. Meru without, or with reduced dorsal white annulus; usually with conspicuous dorsal white annulus on segments 14 or 15 to 19 or 20 or 21; scape black, ventrally yellow.

5. *Ischnojoppa seyrigi* Heinrich

Fig. 55

Ischnojoppa Seyrigi Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 121, ♀♂.

Types

Holotype.—♀, "Mandraka, Madagascar, VII.28, leg. A. Seyrig." C.G.H. I

Allotype.—♂, "Madagascar, Bekily, Reg. Sud de l'ile, 1.34, leg. A. Seyrig." C.G.H. II.

Paratypes.—2 ♀♀, "Fianorantsoa, Madagascar, IX.30, leg. A. Seyrig." C.G.H. I.

Distribution

Madagascar: Mandraka (type locality), Tananarive, Fianorantsoa, Bekily (C.G.H. I. and II.); Angola: Luanda (C.G.H. II.); southwestern Tanganyika: Mbeya (C.G.H. II.).

Preamble

Another species with black apices of femora and tibiae III. Clearly distinguished from all the others, in both sexes, by the dorsally slightly ascending and projecting tip of tibiae III and by the considerably postfurcal nervulus. Last tergite black, in females with, in males without white anal mark. Flagellum of males without annulus, of females only moderately widened beyond middle. First trochanters of legs III with small hump on inner rim.

The species was originally described from Madagascar. It has now been found to be distributed, without significant geographical variation, over tropical East and West Africa.

Female

Dull yellowish; abdomen orange or brownish-tinged toward apex, seventh tergite blackish-infuscated, with white anal mark; ocellar triangle, apices of femora and tibiae III and the base of tibiae III black; flagellum black with white dorsal annulus, basal segments sometimes partially brownish; length 14-16 mm.

Flagellum.—With 39-41 segments, the first about 4.5 times as long as wide, the 10th square, the widest only twice as wide as long. Black, with dorsal white annulus on segments 8 or 9 to 12, the basal segments apically narrowly brownish, in continental populations also ventrally brownish; scape orange, ventrally yellowish.

Head.—Structure as described for tribe; temples distinctly swollen; temple profile not narrowed behind eyes, distinctly curved; malar space 1.5 times as long as width of mandible base. Dorsally orange; in continental populations only ocellar triangle, in Madagascan specimens also frons below it black; face, clypeus, cheeks, mandibles except teeth, and frontal orbits yellow.

Thorax.—Structure as in *flavipennis* Brullé, but scutellum not quite as strongly elevated, dorsally less convex and lateral carinae lower; collare without median incision. Yellow; mesoscutum slightly orange-tinged.

Legs.—Coxae III without trace of scopa; tibiae III (fig. 55) dorsoapically raised, in lateral view forming a hump at tip; coxae III ventrally on inner rim bearing a small, rounded protrusion. Yellow, tibiae and

femora slightly orange-tinged; tarsi III more or less extensively blackish-infuscated; apex of femora III and of tibiae III and the base of tibiae III black.

Wings.—Nervulus unusually strongly postfurcal; nearly clear.

Abdomen.—Basally yellow, gradually more intensely orange-tinged toward apex; seventh tergite, in continental populations also apex of sixth tergite, black, the seventh with longitudinal white anal mark.

Male

Generally as female, but flagellum, with rare exceptions, without annulus; seventh tergite extensively blackish-infuscated, usually without, rarely with small white anal mark; ocellar region and adjacent part of frons down close to antennal sockets black; length 14-16 mm.

Flagellum.—With 39-42 segments; tyloids indistinct. Dorsally blackish or dull brownish, ventrally brownish or orange, as a rule without annulus, except one specimen from Luanda, Angola.

Remark

Males of this species can be mistaken for *geniculata* Tosquinet, particularly the (rare) variants with white anal spot and white flagellar annulus. The only way to distinguish such variants from *geniculata* is to look for the elevation of the tip of tibiae III, the hump on inner rim of ventral side of coxae III and the more postfurcal nervulus.

6. *Ischnojoppa madagascariensis* Heinrich

Ischnojoppa madagascariensis Heinrich, 1938, Mém. de l'Acad. Malgache, XXV, p. 120, ♀♂.

Types

Holotype.—♀, "Madagascar, Rogez, 600 m, VI.-VII.1931, leg A. Seyrig." C.G.H. I. (Partially destroyed by dermestids.)

Allotype.—♂, same locality, I.-II.1931, leg A. Seyrig. C.G.H. II.

Distribution

Madagascar: Ampandrandava, Betroka, Ihosy, Rogez, Fanorana. Prefers dry habitats below 1000 m; occurs throughout the year.

Preamble

The only known species with uniformly black or blackish tibiae and tarsi III (in both sexes); flagellum of female strongly widened; shares this character as well as a median incision in the lamella of collare with *flavipennis* Brullé. The two species seem therefore to be closely related. In female sixth and seventh tergite, in male the seventh only, black or blackish-brown, with white anal marks.

Female

Abdomen pale ferruginous, toward apex orange, head and thorax predominantly yellow; tip of femora III and the entire tibiae and tarsi III black or blackish; sixth and seventh tergites black or blackish-brown, both with large white anal markings; flagellum black, with dorsal white an-

nulus, the segments before annulus apically narrowly, sometimes ventrally entirely brownish; length 14-16 mm.

Flagellum.—With 40 segments, the first nearly 4 times as long as wide, the 9th, square, the widest 3 times as wide as long. Black with dorsal white annulus on segments 9 or 10 to 12; segments before annulus apically narrowly, sometimes ventrally entirely brownish; scape orange.

Head.—Structure as in *flavipennis* Brullé, but cheeks in lateral view not quite as wide, malar space and temple profile behind eyes slightly shorter. Yellow, dorsal parts and frons orange; ocellar triangle sometimes infuscated.

Thorax.—Structure as in *flavipennis;* scutellum likewise strongly raised above postscutellum, dorsally strongly convex, with highly elevated lateral carinae. Yellow, dorsally slightly orange-tinged.

Legs.—Coxae III without trace of scopa. Yellow; all femora and the tibiae I and II pale-orange-tinged; tibiae and tarsi III dorsally black or blackish, very tip of femora III somewhat infuscated; tips of tarsal segments of legs III brownish

Wings.—Nervulus fairly strongly postfurcal; nearly clear.

Abdomen.—Basally yellow, becoming a deeper shade of orange from tergite to tergite, the sixth and seventh tergites black or blackish-brown, both with large white anal marks.

Male

Generally as female; ocellar region and adjacent median part of frons down close to antennal sockets black; flagellum black, without annulus; only the seventh tergite with white anal mark; length (allotype) 16.5 mm.

Flagellum.—(Allotype); with 39 segments; rather indistinct tyloids on segments (approximately) 10-20. Black, ventrally blickish-brown; scape black, ventrally yellow.

7. *Ischnojoppa diversapex*, new species

Fig. 56

Types

Holotype.—♀, "S. W. Tanganyika, Mbeya, 20.XI.62." C.G.H. II.
Paratype.—1 ♀, same locality, 19.XI.62. C.G.H. II.

Distribution

Southwestern Tanganyika: Mbeya (type locality).

Preamble

A perfectly typical species of this genus, except only for the apex of the abdomen of females; in contrast to all other known species, the apex is not pointed and oxypygous, but blunt and semiamblypygous, the seventh tergite being broadly truncate and the ovipositor concealed.

Female

Light yellowish-ferruginous (pale orange); apices of femora III and of tibiae III and the base of tibiae III narrowly black; tarsi III partially infuscated; ocellar triangle slightly infuscated or black; apex of sixth and

the seventh tergite black, apical margin of the former very narrowly, of the latter more broadly, white; flagellum predominantly black, with dorsal white annulus; length 15 mm.

Flagellum.—With 39—40 segments, the first not quite 4 times as long as wide, the 10th square, the widest slightly more than twice as wide as long. Black, with dorsal white annulus on segments 8 (apex) or 9 (apex) to 12; the basal 3-5 segments apically narrowly and ventrally more or less extensively brownish; scape orange.

Head.—Structure as in *flavipennis* Brullé; malar space almost twice as long as width of mandible base. Yellowish; dorsal parts, except frontal orbits, slightly orange-tinged; ocellar triangle slightly infuscated or black.

Thorax.—Structure as in *flavipennis*, but anterior part of central area of propodeum (space of area basalis) obliterated by rugosity. Yellow, mesoscutum faintly orange-tinged.

Legs.—Coxae III without trace of scopa. Slightly orange, coxae and trochanters I and II more yellowish-tinged; apex of femora and tibiae III fairly broadly, base of tibiae III narrowly black; segments I (apex) to 4 of tarsi III dark brownish-infuscated.

Wings.—Nervulus interstitial; clear.

Abdomen.—General structure and sculpture as typical for the genus, the seventh tergite, however, apically broadly truncate (fig. 56) and the ovipositor abbreviated and not projecting; postpetiole rather strongly and densely punctured, including middle. Basally pale orange-yellow, becoming progressively deeper orange from tergite to tergite; apex of sixth and seventh tergites black, the former with narrow, the latter with wider, white apical margin.

26. Genus *Pseudischnojoppa*, new genus

Figs. 50, 51, 52

Type species.—*Pseudischnojoppa mbeyana*, new species

Distribution

Southern Tanganyika.

Preamble

Agrees with *Ischnojoppa* Kriechbaumer in structure of mandibles and abdomen and in chromatic pattern. Propodeum shorter, its declivity distinctly longer than horizontal part medially, with complete and distinct carination; area superomedia clearly separated from area basalis, hexagonal, longer than wide; head similar to *Ischnojoppa*, but temple profile much shorter and temples declivous from shortly behind eyes.

The genus stands on the borderline between Ischnojoppini and Ichneumonini, but it seems to me to be closer to the former.

Morphological characters

Flagellum.—Of females fairly long, bristle-shaped, ventrally flattened beyond middle, sharply attenuated at apex, but, in contrast to *Ischnojoppa*, not widened.

Head (fig. 50).—Similar to *Ischnojoppa* by the relatively long malar space and wide cheeks, but not quite as featureless as in *Ischnojoppa*; a

slight, longitudinal depression on the malar space is indicated, and there is also a very faint indication of a suture between face and clypeus; the latter with very small, bipartite, median projection; temples much shorter, in dorsal view, than in *Ischnojoppa*, declivous shortly behind margin of eyes, with distinctly curved outline, mandibles as in *Ischnojoppa*.

Thorax.—Collare without lamella; transverse furrow behind collare medially interrupted by a slight convexity; basal part of notauli sharply impressed; scutellum as in *Ischnojoppa;* propodeum (fig. 51) differing as described in preamble; area superomedia somewhat longer than wide, hexagonal, with costulae usually before middle; areae dentiparae distinctly slanting; carina coxalis distinct; sculpture less coarse and dense than in *Ischnojoppa*.

Legs.—Fairly slender, moderately long; coxae III of females without scopa.

Wings.—Areolet pentagonal, but strongly narrowed in front, close to quadrangular; nervulus interstitial; radius nearly straight.

Abdomen.—As described for the tribe, tergites 4 and 5, however, not longer than wide but square (fig. 52); the fifth tergite less densely punctured than in *Ischnojoppa*, not subopaque.

Chromatic characters

As described for the tribe: legs without black marks; white anal marks present.

1. *Pseudischnojoppa mbeyana*, new species

Figs. 50, 51, 52

Types

Holotype.—♀, "S. W. Tanganyika, Mbeya, 20.XI.62." C.G.H. II.

Paratypes.—5 ♀♀, type locality, 18.-20.XI.62. C.G.H. II.

Distribution

Southwestern Tanganyika, Mbeya (type locality).

Female

Pale orange; the following are whitish-yellow: mandibles except teeth, clypeus, face, orbits broadly around eyes, cheeks, collare, scutella, sterna, propleura and mesopleura, coxae and trochanters I and II; apex of sixth tergite partially and the seventh tergite black, the former with medially widened white apical band, the latter with large oblong white anal mark; flagellum tricolored; length 9-11 mm.

Flagellum.—With 37-38 segments, the first fully 4 times as long as wide, about the 15th square, the widest scarcely wider than long, the last seven segments distinctly longer than wide. Black, with dorsal white annulus on segments 7-14 (in all specimens); basal 2-3 segments ferruginous.

Head.—Structure as described for genus; malar space slightly longer than width of mandible base; face and base of clypeus fairly densely though not very strongly, vertex sparsely punctured, the rest almost smooth. Color as described above.

Thorax.—Structure as described for genus; anterior fourth of notauli sharply impressed; mesoscutum moderately densely and strongly punctu-

red, coriaceous between punctures; scutellum dorsally sparsely punctured, extremely finely coriaceous, shiny; mesopleura and metapleura, except polished speculum, densely and strongly rugose and punctate. Color as described above.

Legs.—Light orange, coxae and trochanters I and II yellowish; tarsi II and III brownish-orange.

Abdomen.—Second tergite distinctly longer than apically wide, the third only slightly longer than wide, the fourth and fifth about square; lateral fields of postpetiole densely and strongly punctured, the median field finely and irregularly rugose, with only a few punctures on base; space between gastrocoeli aciculate; tergites 2-4 densely rugose-punctate, subopaque, the fifth finely and sparsely punctured, finely coriaceous between punctures and somewhat shiny. Color as described above; basal segments yellowish-orange, becoming deeper orange toward apical segments.

IV. Tribe *Trogini* Ashmead

Figs. 57, 58, 59

Trogini Ashmead, 1895, Proc. Ent. Soc. Wash., III, p. 278.

Type genus.—*Trogus* Panzer

Distribution

Subtribe *Callajoppina* Heinrich (Can. Ent., Suppl. XXIX, p. 809-810; *type genus.*—*Callajoppa* Cameron): Holarctic, Oriental, Neotropic, and (only a few species) also Ethiopian regions.

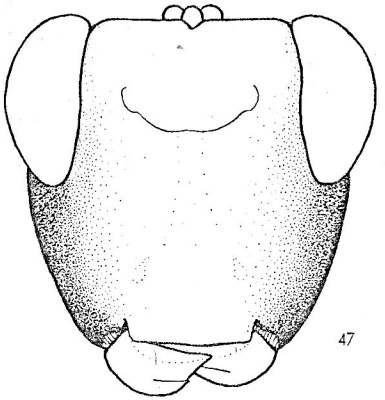
Subtribe *Trogina* Heinrich (op. cit. p. 844; *type genus.*—*Trogus* Panzer): Holarctic and Oriental regions; not recorded from and apparently not present in the Ethiopian region.

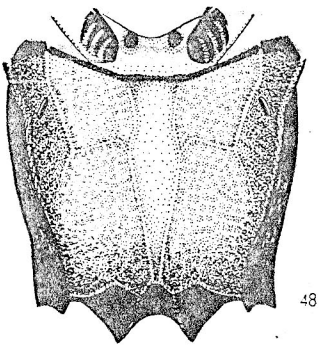
Genus *Pepsijoppa* Heinrich: Central Africa.

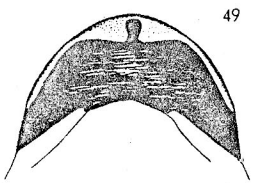
Preamble

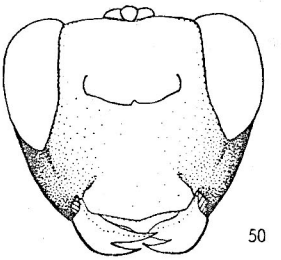
In 1961 (Cat. and Reclass. of Indo-Austr. Ichn.) Townes changed the position of the subtribe *Callajoppina* from the tribe Trogini to the tribe *Protichneumonini* (syn. *Ichneumonini* Townes). The existence of a certain relationship between the *Protichneumonina* (as explained in this paper) and the *Callajoppina* is obvious and was already indicated in my sketch of a genealogical tree of the subfamily 30 years ago (Mitt. Zool. Mus. Berlin, 1934), in which I put *Protichneumon* on the base of the branch leading up to *Callajoppa* Cameron and *Trogus* Panzer. But at least the same degree of relationship seems to connect the *Callajoppina* with the *Trogina*. There are forms which can be regarded as structurally intermediate between these two subtribes, as for example the Oriental species *Erythrojoppa tibialis* Cameron and the genus *Neofacydes* Heinrich, one species of the latter genus even being recorded as a parasite of Sphingidae. Therefore I do not see any practical advantage nor any progress in an alteration of the status quo ante. For a more detailed discussion and explanation of this matter see Heinrich, Can. Ent., Suppl. XXIX, p. 808.

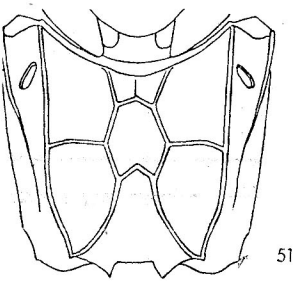
The character regarded so far as fundamentally (and practically alone) distinctive of the tribe is the abbreviated structure of the propodeum, with its smooth culminating boss or arch and two declivites, slanting down from

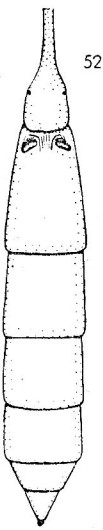






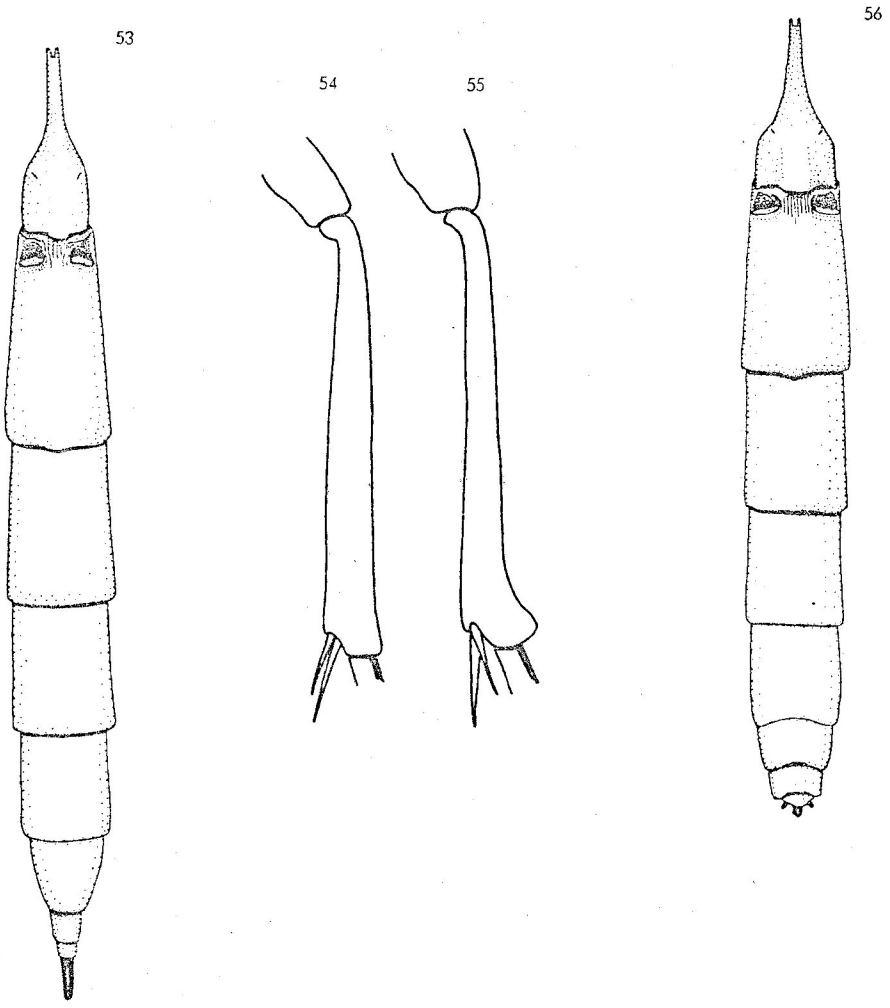






IX

Figs. 47-52. 47, *Ischnojoppa flavipennis* (Brullé), ♀, head (frontal; 48, same species, ♀, propodeum: 49, same species, ♀, collaral lamella; 50, *Pseudischnojoppa mbeyana* Heinrich, ♀, head (frontal); 51, same species, ♀, propodeum; 52, same species, ♀, abdomen.



X

Figs. 53-56. 53, *Ischnojoppa flavipennis* (Brullé), ♀, abdomen; 54, same species, ♀, tibia III; 55, *Ischnojoppa seyrigi* Heinrich, ♀, tibia III; 56, *Ischnojoppa diversapex* Heinrich, ♀, abdomen.

the culminating point toward the front and rear of the propodeum. Less attention has been paid to the wing venation, which seems to offer a second, no less valuable character: the shape of the areolet; this shows in all *Callajoppina* a clear and constant tendency to be petiolate and obliquely trapezoidal by prolongation of the second intercubitus and abbrevation of the second abscissa of cubitus. This tendency is almost always recognizable, though it has reached different degrees of development, the highest in the American genus *Tricyphus*, where the areolet comes close to a triangular outline, recalling the areolet of a *Pimpla*. The peculiar structural tendency of the areolet described is not found in the Protichneumonini, where the areolet is most usually regularly pentagonal and retains a regular rhomboidal shape with the intercubiti of equal length, even when (in some tropical genera) the intercubiti are coalescent. The areolet is never petiolate in the Protichneumonini. If we use the structure of the areolet as a second distinction of the Callajoppina, it becomes evident that their relationship to the Trogini is closer than to the Protichneumonini, and it gives us a character which permits us to draw a rather clear boundary between the tribe Trogini and the Protichneumonini.

That the subtribe *Trogina* is seemingly not represented at all in Africa south of the Sahara, the subtribe *Callajoppina* only by three described forms, is strange, as the hosts of *Trogina*, species of *Papilio*, as well as *Sphingidae*, the hosts of the *Callajoppina*, abound in Africa.

As no species of the subtribe Trogina is recorded from Africa, in consideration of the geographical restriction of this paper no general diagnosis of the tribe is given, but only the description of the subtribe Callajoppina.

The strange genus *Pepsijoppa* Heinrich is tentatively attributed to this tribe for reasons discussed in the description of the genus, which does not fit in the subtribe Trogina nor in the subtribe Callajoppina.

IV. A. Subtribe *Callajoppina* Heinrich

Callajoppina Heinrich, 1962, Can. Ent., Suppl. XXIX, pp. 809, 810.

Type genus.—*Callajoppa* Cameron

Preamble

The three African forms of this subtribe belong to one genus, *Afrotrogus* Heinrich, which is related to the Oriental genus *Dimaetha* Cameron (syn. *Erythrojoppa* Cameron, according to Townes, 1961), but not identical with it. On account of the geographical restriction of this paper, the discription of the structural characters of the subtribe, given below, is based on the genus *Afrotrogus* only.

Morphological characters

Flagellum.—Of females bristle-shaped, moderately long, ventrally flattened and strongly widened beyond middle, sharply pointed at apex: of males with rather small short-oval tyloids, slightly nodose by distinct. subapical transverse bristle-ridges on the segments.

Head.—Outline of temples behind eyes only slightly narrowed and distinctly curved; cheeks wide and convex between middle of outer orbits and carina genalis, more or less narrowed towards mandible base; exterior edge of clypeus and of face somewhat raised, the middle of face and of

the base of clypeus convex, face and clypeus between this median convexity and the outer edge slightly concave (fig. 58); mandibles stout and wide, with strong, widely gaping teeth, the upper somewhat longer and slightly slenderer than the lower; ocellar triangle, except behind, surrounded by a deep furrow.

Thorax.—Mesoscutum moderately convex, very densely punctured, opaque; notauli only basally indicated; scutellum densely and strongly punctured, with indication of lateral carinae, only uppermost part smooth, gibbose in females, clearly pyramidal in males (fig. 59); propodeum (fig. 57) abbreviated, slanting downward from a culminating, smooth, narrow arch (replacing the anterior bordering carina of the rudimentary area superomedia) backwards toward the base of coxae III as well as in front into the deep and wide basal furrow of the propodeum; anterior slope smooth and without carinae, the posterior slope densely and coarsely rugose-punctate and mainly occupied by the two unusually large areae dentiparae, which are carinate all around, and by the very long area posteromedia; metapleura bulging, without carinae coxales; mesopleura with longitudinal, fairly deep and wide depressions in the middle, reaching from posterior border of mesopleura nearly to anterior border.

Legs.—Fairly stout and short; coxae III of females with rather strong scopa; tarsi I and II distinctly widened and ventrally flattened.

Wings.—Nervulus postfurcal; areolet irregularly trapezoidal and short-petiolate, radius sinuate.

Abdomen.—Longish-oval, of females distinctly oxypygous; postpetiole wide, slightly convex, without median field, coarsely irregularly punctate, the middle very finely, longitudinally striate; tergites 2 and 3 very densely and coarsely punctate, without aciculation; gastrocoeli fairly deep, triangular, with distinct thyridia, the space between gastrocoeli slightly narrower than one of them; sternites 2-3 or 4 with plica, second sternite with distinct but small thyridia.

Chromatic characters

All known African forms are distinguished by deeply infuscated wings and light-ferruginous color of the body, including legs and sometimes part of flagella, combined with entirely or partially blue-black abdomen; legs III and flagella sometimes predominantly black.

Hosts

The hosts of all Callajoppina are Sphingidae; it can be assumed that the Ethiopian members of the subtribe are no exceptions, although their hosts are not yet recorded.

27. Genus *Afrotrogus* Heinrich, new status

Erythrojoppa Cameron, subgenus *Afrotrogus* Heinrich, 1938, Mém. Acad. Malg., XXV, pp. 26-27.

Type species.—*Camarota madagascariensis* Szépligeti, original designation.

Distribution

Central and East Africa, and Madagascar.

Preamble

The few Ethiopian forms of the subtribe Callajoppina, treated below under this genus, are distinguished by a sharply oxypygous abdomen in females and by a conspicuous scopa on the ventral side of their coxae III. The densely punctured sculpture of the anterior tergites, lacking any trace of aciculation, is another character of the group, differentiating it from the Oriental genus *Erythrojoppa* Cameron (synonym of *Dimaetha* Cameron, according to Townes, 1961); the sexually dimorphic structure of the scutellum, which is simply gibbose in females but clearly pyramidal in males, may be considered an additional generic distinction.

Morphological and chromatic characters

As described for the subtribe.

Key to the species of *Afrotrogus* Heinrich

Females

1. About 14 basal segments of flagellum light orange; all legs, including coxae, uniformly light ferruginous; propleura ferruginous with black mark on lower part. (Abdomen blue-black, only petiole ferruginous to varying extent; length 20-22 mm.) ..... 2. *rufipedalis* (Morley)
   Eastern Africa from Kenya south to Southern Rhodesia

   Flagellum uniformly black; legs partially black, propleura ferruginous, without black mark. 2

2. Femora and tibiae III uniformly black, coxae III partially black; abdomen uniformly blue-black. (Length 19-21 mm.) ..... 3. *nigripedalis* (Morley)
   Uganda and Congo

   Femora, tibiae, and coxae III uniformly ferruginous; usually tergites 1-3, at least the first tergite ferruginous. (Length 22 mm.) ..... 1. *madagascariensis* (Szépligeti)
   Madagascar: Montagne d'Ambre

1. *Afrotrogus madagascariensis* (Szépligeti)

Camarota madagascariensis Szépligeti, 1903, Bull. Mus. Hist. Nat. Paris, IX, pp. 336 to 337, ♀.

Erythrojoppa (Afrotrogus) madagascariensis Heinrich, 1938, Mém. Acad. Malg., XXV, p. 27, ♀♂.

Types

Holotype.—♀, "Muséum Paris, Madagascar, E. Fleutiaux, 1903". M.N.H.N.

Distribution

Madagascar: Montagne d'Ambre.

Female

Head, thorax, legs (except tibiae and tarsi I and II, and tarsi III), and at least the first tergite, usually tergites 1-3, ferruginous; the following tergites black; flagellum black, without annulus; tibiae I and II dorsally and all tarsi predominantly or entirely, black; wings uniformly deeply infuscated; length 22 mm.

Flagellum.—Structure as described for the subtribe; with 40 segments, the first about 2.5 times as long as wide, the 9th square, the widest more than twice as wide as long, the last seven segments distinctly longer than wide. Black, the flat part light brown, scape and pedicel ferruginous-red.

Head.—Structure as described for the subtribe. Uniformly ferruginous, only the teeth of mandibles black.

Thorax.—Structure and sculpture as described for the subtribe; mesopleura very coarsely and densely rugose-punctate, distinctly longitudinally striate below speculum, which is large, in type specimen extending over nearly the whole length of mesopleura. Uniformly ferruginous.

Legs.—Structure as described for the subtribe; coxae III coarsely and densely punctured, with fairly large scopa. Ferruginous; in type specimen tibiae I and II and all tarsi dorsally black, except about basal half of metatarsus III.

Wings.—As described for the subtribe.

Abdomen.—Structure and sculpture as described for the subtribe. Black, usually tergites 1-3, rarely only the first and the base of the second tergite, ferruginous.

Male

Abdomen seemingly more extensively black than in female, in one of the two known specimens entirely black, in the other with only the first tergite and base of the second ferruginous; otherwise, according to Heinrich 1938, as female.

2. *Afrotrogus rufipedalis* (Morley), new combination

Figs. 57, 58, 59

Erythrojoppa rufipedalis Morley, 1919, Proc. Zool. Soc. London, pp. 124/125, ♀.

Types

Holotype.—♀, "Nyasaland, Mlanje, May 26, 1913, S.A. Neave". B.M. No. 3b-29.

Neallotype.—♂, "Tanganyika, Morogoro, I.1963". C. G. H. II.

Distribution

Nyasaland: Mlanje (type locality); Ruo Valley and southwest of Lake Chilwa, 2000-3000 ft. (Morley, loc. cit.); Tanganyika: West Usambara Mts., 1700 m, Uluguru Mts., 700 m, Mbeya (C.G.H. II.); Kenya: Masongaleni, 3000 ft. (Morley, loc. cit.); Southern Rhodesia: Chirinda Forest and Mt. Selinda (N.M.B.).

Preamble

Females of this species are distinguished from the females of the other two Ethiopian forms by light-orange color of the (about) 14 basal segments of the flagellum and by uniformly light-ferruginous color of all legs, head, and entire thorax, except for a black mark on the lower part of propleura. The associated male (collected along with several females at the same spot and time near Morogoro, Tanganyika) differs from the female by dorsally black flagella and predominantly black legs III, and thus seems to be very similar to the male of *nigripedalis Morley*, as described by Morley.

Female

Head, thorax, and legs uniformly light ferruginous (except for a black mark on lower propleura); abdomen, except petiole, uniformly blue-black;

wings uniformly and deeply infuscated; flagellum light orange, the apex black; length 20-22 mm.

Flagellum.—Structure as described for the subtribe; with 43 or 44 segments, the first about 2.5 times as long as wide, the 10th square, the widest more than twice as wide as long. Scape and segments 1 to about 14 light orange, the rest black.

Head.—(Fig. 58); structure as described for the subtribe; clypeus, face and apex of cheeks fairly densely punctured, middle of face very finely alutaceous between punctures; frons below ocelli usually with fine rugosity, sometimes converging in V-shape toward the middle of frons. Uniformly light ferruginous.

Thorax.—(Fig. 57); structure and sculpture as described for the subtribe; mesopleura densely rugose-punctate, with fine longitudinal striation below speculum. Uniformly light ferruginous, except for a black mark on lower propleura.

Legs.—Structure as described for the subtribe; fairly short and stout; coxae III densely punctured, with fairly large scopa. Uniformly light ferruginous.

Wings.—As described for the subtribe.

Abdomen.—Structure and sculpture as described for the subtribe. Uniformly blue-black, only petiole light ferruginous to varying extent.

Male

Scutellum pyramidal (fig. 59); femora, tibiae, and tarsi III, tarsi II and part of ventral side of coxae III, black; flagellum dorsally black, the basal segments ventrally orange; otherwise as female, including black mark on lower propleura; length 21 mm.

Flagellum.—With 41 segments, segments with distinct, subapical bristle-ridges, and thus slightly nodose, with only very small, inconspicuous oval tyloids on segments 9-19. Black, basal segments ventrally pale orange, from third segment on to gradually decreasing extent; scape ferruginous.

Remark

As the structure of *rufipedalis* is identical with *madagascariensis* Szépligeti, the two are probably vicariant forms; the strong and constant discrepancy in color seems to suggest, however, that the differentiation has reached specific status.

3. *Afrotrogus nigripedalis* (Morley), new combination

Erythrojoppa nigripedalis Morley, 1919, Proc. Zool. Soc. London, p. 125, ♀♂.

Types

Holotype.—♀, "Uganda, Entebbe, 1.-11. Sept. 1911, S. A. Neave". B.M. No. 3b-30.

Distribution

Uganda: Entebbe (type locality) and Buddu, 3700 ft. (Morley, loc. cit.); Congo: Bambesa (C.M.); Morley's record from Nyasaland, Mlanje, needs confirmation (it was perhaps based on a male which can not be distinguished yet from *rufipedalis* ♂).

Preamble

Very similar to *rufipedalis* Morley and perhaps its vicariant form, as sympatric occurrence of the two forms is still questionable; but even if they indeed replace each other geographically, I think they should be considered distinct species, as they differ somewhat in the structure of the head: in *nigripedalis* ♀ the outline of cheeks is somewhat more narrowed toward mandible base, and the cheeks in lateral view at about middle of outer orbits are less convex and distinctly narrower compared with the diameter of eyes at the same place than in *rufipedalis;* puncturation of cheeks, particularly on upper part, coarser and denser than in *rufipedalis.*

Female

Head, thorax, and legs ferruginous, except femora, tibiae, and tarsi III, the tarsi II and ventral side of coxae III, which are black; abdomen uniformly blue-black; wings uniformly and deeply infuscated; flagellum uniformly black; no black mark on propleura; length 19-21 mm.

Otherwise as *rufipedalis* ♀, and as described for the tribe.

Male

According to original description, agrees with the female, except that the scutellum is pyramidal.

If my association of sexes of *rufipedalis* is correct, then the males of the two species are almost completely alike; their separation needs further investigation.

28. Genus *Pepsijoppa* Heinrich

Pepsijoppa Heinrich, 1935, Miss. Scient. de l'Omo, III, p. 232; first publication of the name and designation of the type species.

Pepsijoppa Heinrich, 1936, Dt. Entom. Zeitschr., pp. 199-200; description of the genus.

Type species.—Trogus gryps Morley, monobasic.

Distribution

Uganda, Nyasaland, northern Tanganyika, Southern Rhodesia.

Preamble

The type species is the largest known African species of the subfamily. It has a striking similarity in general appearance to some fairly common forest-dwelling species of African spider wasps (Pompilidae).

The taxonomic position of this genus is rather problematic. Within the subfamily, this huge insect comes closest in general appearance to the species of the subtribe Callajoppina of the Trogini, but the structure of the propodeum is quite different from the norm of this group and quite unique (see below). The presence of a recognizable, though oddly shaped, area superomedia and the lack of an anterior declivity of the propodeum seems to indicate some relationship to the Protichneumonini, but the structure of the areolet is exactly the same as in the Callajoppina and wholly inconsistent with the supposed relationship. The areolet is petiolate and strongly *irregularly*-trapezoidal, the second intercubitus being longer than the first and the second abscissa of cubitus shorter than the first. This venation is typical of the Callajoppina, but not found in the Protichneumo-

nini. So I think that the genus is best placed in the Trogini, without attributing it to one of the two named subtribes. It may perhaps represent an ancient form.

Morphological characters

Flagellum.—Of females bristle-shaped, rather short in comparison with the enormous size of the insect, of primitive structure, that is, not considerably widened beyond middle, not strongly attenuated, inconspicuously flattened on ventral side of apical part, with short segments even at base; of males likewise primitive, not nodose, with a row of very small, oval tyloids.

Head.—Rather normal, except for a very deep longitudinal impression on each side of the convex median field of face down to clypeal foveae; temple profile very slightly narrowed behind eyes and distinctly curved; frons concave; occiput behind ocelli with a small swelling in the middle and a concavity on each side of it; cheek profile narrowed toward mandible base and almost straight; malar space almost one-third shorter than the width of mandible base; carina genalis normal, straight, meeting carina oralis at mandible base; clypeus normal, its apical margin almost straight (very slightly curved); mandibles robust, normal, the upper tooth not pointed, but apically rounded.

Thorax.—Mesoscutum somewhat longer than wide, slightly convex, finely and densely sculptured, opaque, covered with a dense pile; notauli indicated only at the very base; each of the three lobes with a narrow, continuous, longitudinal median impression; scutellum very strongly raised above postscutellum but not at all raised above the level of mesoscutum, laterally carinate to about middle; propodeum very coarsely and irregularly reticulate-rugose (except for the more finely sculptured areae superoexternae), with deep, pronounced basal furrow, and, in contrast to the norm of the Callajoppina, with a horizontal part, which is medially considerably raised, bearing a clearly recognizable, long, triangular area superomedia, gradually narrowing from the broadly transverse posterior, toward the very narow anterior end; on each side of the raised median part a large, deep concavity, bordered on exterior side by the extremely prominent anterior sector of the outer edge of the horizontal part; costulae inserted at the posterior end of area superomedia; areae dentiparae steeply declivous from costulae, short, concave; their apices projecting in a short but distinct, broadly rounded, upward-curved tooth; areae coxales indicated; mesopleura strongly and moderately densely punctured, before coxae II coarsely rugose-punctate; a small, indistinct speculum indicated.

Legs.—Long and strong; bases of all claws pectinate in both sexes; coxae of females without scopa.

Wings.—Nervulus interstitial; areolet irregularly trapezoidal (the second abscissa of cubitus shortest, the second intercubitus longest), distinctly petiolate; radius slightly sinuate.

Abdomen.—Of females short-oval, amblypygous; petiole in the middle dorsally distinctly narrower than high, apically gradually widening into postpetiole; the latter flat, the apical part without the slightest indication of a median field, the base, however, with two short longitudinal carinae, finely and very densely punctured, subopaque, hairy; gastrocoeli very

small and superficial, thyridia obsolete; second and third tergites densely and extremely finely punctured, covered with short hairs (as are the following tergites also); apex of hypopygium of males with broad, slightly curved, apical margin.

Note

A trapezoidal areolet occurs occasionally also in the tribe Ichneumonini, but its structure is rather different from that of *Pepsijoppa* and the *Callajoppina,* and is found only in subtribes (as in the Aethioplitina) to which *Pepsijoppa* can not possibly be related.

Chromatic characters

Characteristic features are deep infuscations of wings (partially reduced in males) and the entire lack of white markings; the body is black, including coxae, the legs, and in males sometimes also the flagella, parts of head and first segment of abdomen are orange.

Pepsijoppa gryps (Morley)

Trogus gryps Morley, 1919, Proc. Zool. Soc. London, p. 122, ♀.
Pepsijoppa gryps Heinrich, 1935, Miss. Scient. de l'Omo, p. 232; description of male.
Pepsijoppa gryps Heinrich, 1936, Dt. Entom. Zeitschr., pp. 199-200, ♀; as type species of *Pepsijoppa*, new genus.

Types

Holotype.—♀, "Entebbe, Uganda, 17. June 1913, C. C. Gowdey." B.M. No. 3b-703.

Neallotype.—♂, Kilimanjaro: Kilema, 1440 m, March 1912, Ch. Alluaud and Jeannel. M.N.H.N.

Distribution

Uganda (type locality); northern Tanganyika (neallotype); Nyasaland; Southern Rhodesia (B.M.).

Female

Black, including coxae and trochanters, coxae and trochanters I and II sometimes ventrally ferruginous; femora, tibiae, and tarsi orange; wings evenly and deeply infuscated; basal 15-20 segments of flagellum ferruginous-orange; face, clypeus, and cheeks usually indistinctly and more or less extensively dark-red-tinged; length 27 mm.

Flagellum.—Structure as described for the genus; with 54 segments, the first not quite twice as long as wide, the 7th square, the widest nearly twice as wide as long. Black, the basal 15-20 segments and the scape ferruginous-orange.

Structure of all other parts as described for the genus. Color as described above.

Male

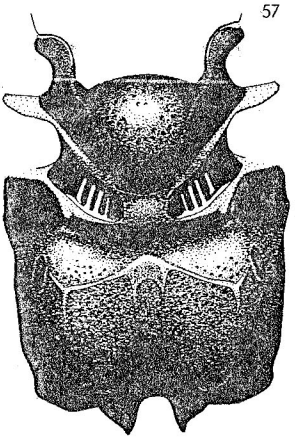
The neallotype from Kilimanjaro matches the holotype perfectly and agrees with it almost exactly in color. *Black, including coxae and trochanters; femora, tibiae, and tarsi orange; flagellum black (only segments 28-32 ventrally reddish); wings uniformly and deeply infuscated; face indistinctly dark-reddish-tinged; length 25 mm.*

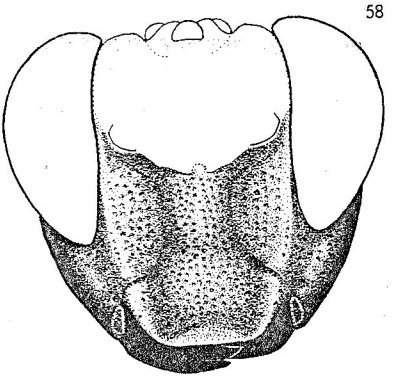
Variation

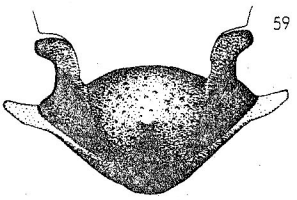
I have seen males with black and with bright-orange flagella, with uniformly deeply infuscated wings and with apically broadly whitish and translucent wings, also a specimen with orange postpetiole. The scantiness of the material does not permit a safe conclusion whether these are all variants of one and the same species, or whether the genus perhaps contains two different species; I favor the former alternative.

Note

The British Museum has a type No. 3b-104 under the name "*Aulojoppa sulcipes* Cameron". This is a ♀ of *Pepsijoppa gryps* from Uganda. The name *Aulojoppa sulcipes* seems never to have been published.







XI

Figs. 57-59. 57, *Afrotrogus rufipedalis* (Morley), ♀, propodeum; 58, same species, ♀, head (frontal); 59, same species, ♂, scutellum.

ADDENDA and CORRIGENDA

The following comprises additions and corrections to Volume I of this synopsis, already printed. Additions to already described species or genera will appear under the original numbers of these species and genera. The place where a new genus described in these addenda is supposed to go in the sequence of previously treated genera will be indicated by using the number of the particular taxon after which the new one should be inserted, with addition of an "a". New species will receive the number subsequent to the last one previously treated in the genus.

Acknowledgment

p. 7, add the following paragraph:

The continual appearance of new forms of African Ichneumoninae during my long years of work on this synopsis in many cases made reexamination of types or direct comparison of specimens with the type indispensable. All museums in Africa and continental Europe involved have magnanimously sent me the revelant types on loan. Mr. G. T. Kerrich of the Commonwealth Institute of Entomology in London most generously sacrificed his time to re-examine and make comparisons with types located in the British Museum (Natural History). To him I feel most deeply indebted for this efficient aid and wish to express my great gratitude.

Biological Notes

p. 18, first paragraph:

The remark that "altogether not more than three host records for the entire continent" are known, has been found to be not quite correct. The list of host records will be given at the end of the last volume of this synopsis. The number is at present estimated at about 10.

I. Tribe *Protichneumonini*
I B. Subtribe *Apatetorina*
9. Genus *Leptophatnus* Cameron

15b. *Leptophatnus pseudominor congicus*, new subspecies

Types

Holotype.—♀, "Elisabethville, VI.1962, Congo, M. S. Bourgeois." Collection H. Townes.

Distribution

Congo: Elisabethville.

Female

More melanistic than nominate form; the following black: head (except ferruginous face and clypeus and white markings as in nominate form), prosternum, prepectus, pronotal base broadly, mesolcus, mesosternum apically, subalarum with contiguous part of mesopleura, inferior apical part of mesopleura, areae coxales, and basic color of all coxae; first and second tergites with narrow white apical margins; otherwise as in nominate form.

13. Genus *Triangulora* Heinrich

Male

One male from Uganda in collection H. Townes belongs quite obviously to this genus. As is to be expected (in a parallel to the Oriental genus *Ileanta* Cameron), it does not share the specialization of the metatarsus III with the female. However, it also lacks the triangular projection on the end of the carina oralis, so characteristic of the holotype; instead the entire carina oralis is reduced to a vestige of a carina, with only a very small elevation at the extreme end, contiguous to the end of the carina genalis, that is, at exactly the same place where the female of the type species bears the triangular projection.

Whether the reduction of the carina oralis and of its apical projection in the male discussed above is a matter of normal sexual dimorphism or a specific character cannot be said until a female from Uganda is found.

In all other characters, structural and sculptural as well as chromatic, the male from Uganda agrees well with the female of the type species.

Flagellum.—With 36 segments, moderately nodose, with distinct bristle-ridges on ventral side of segments, without sigilla; tyloids indistinct, extremely small, hardly detectable, on about segments 13-16.

16. Genus *Liojoppa* Szépligeti

2b. *Liojoppa occidentalis ugandae*, new subspecies

Types

Holotype.—♀, "Kampala, Uganda, Oct. 1965, Denis F. Owen." Collection H. Townes.

Paratypes.—1 ♀, same locality, July. Collection H. Townes; 1 ♀, same locality, July. C.G.H. II.

Distribution

Uganda.

Preamble

This form shares all structural characters, in particular the specialization of lower cheeks and the proportions of the flagellum, with the West African *occidentalis* Heinrich; it thus differs clearly in the flagellar characters from *centralis* Heinrich from the Congo, which seems to confirm the specific status of *centralis*.

Female

More melanistic than the West African subspecies; mesoscutum entirely black, with only two short median lines and the prescutellar carinae yellow; black mark on mesopleura below subalarum emitting a black band into depression below speculum, sometimes extending to the posterior border of mesopleura; horizontal part of propodeum including areae spiraculiferae and the declivity more extensively black than in nominate form, the yellow reduced to bands surrounding the predominantly black areae; tarsi II and III and apex of tibiae III black or blackish, the tarsi I and dorsal side of femora and tibiae I and II slightly infuscated; length 9-11 mm.

20. Genus *Afrocoelichneumon* Heinrich

9. *Afrocoelichneumon clavicornis*, new species

Types

Holotype.—♀, "Zika Forest, Uganda, VIII.21.'63, G. Lancaster." Collection H. Townes.

Allotype.—♂, same data. Collection H. Townes.

Paratypes.—2♂♂, same locality, 21. and 23. VIII. C.G.H. II.

Distribution

Uganda.

Preamble

In structure and chromatic characters, a completely typical species of the genus, but in one unique character strikingly different from all others: the structure of the flagellum of females (see below). Scutellum laterally carinate to about middle as in *cornelliger* Morley; chromatically also somewhat simliar to *cornelliger*. Tarsi strikingly abbreviated and rather wide in female. Male without striking specialization.

Female

Basic color of head and thorax black, with very rich white markings; abdomen red, tergites 1 and 2 with small, latero-apical yellow marks, the third tergite with a faint indication of such marks, the apical margins of these tergites narrowly yellow-tinged; the first tergite basally and apically black-brown-infuscated; mesoscutum with rounded median white mark; postscutellum, and middle of scutellum broadly, white; coxae I and II predominantly, coxae III extensively, white; all femora and tibiae predominantly black or black-brown; flagellum with white annulus; length 14 mm.

Flagellum.—Short, of unique structure: strongly widened and ventrally flattened beyond middle, but without tapering apical section, instead abruptly ending with a short broad conical segment, the penultimate segment still more than twice as wide as long; the flagellum as whole thus has a slightly clavate appearance; with 26 segments, the first about 1.5 times as long as wide, the fifth square, the widest 3 times as wide as long. Black, with dorsal white annulus on segments 7 (apex) to 13; scape ventrally ferruginous.

Head.—Structure as described for the genus; temple profile only slightly narrowed behind eyes, broadly curved; cheeks in lateral view fairly wide and moderately swollen; malar space somewhat more than half as long as width of mandible base. White; the following black: antennal cavities, middle of frons broadly, ocellar, occipital, and temple regions (the black on the latter almost interrupting the white band on orbits), and a large mark on the middle of face (connected below on each side by a narrow black band with the clypeal foveae); clypeus medio-apically and the apices of mandibles ferruginous, the mandible teeth black.

Thorax.—Structure as described for the genus; mesoscutum distinctly more finely punctured than in *cornelliger*, anterior fourth of notauli recognizable but rather weak, anterior part of sternauli barely indicated; scutellum flat, laterally carinate to about middle; central area of propo-

deum highly polished. Black; the following white: collare, pronotal ridge and base, subalarum, a rounded mark on the middle of mesoscutum, a broad median longitudinal band on scutellum, postscutellum, a continuous longitudinal band on inferior half of mesopleura (which extends in front onto prepectus), carinal triangle, a large mark on posterior half of mesopleura, narrow lateral bands on declivity of propodeum (following the carinae dentiparae interiores).

Legs.—Stout and rather short; coxae III without trace of scopa; all tarsi (but particularly tarsi I and II) abbreviated, tarsi I and II (in a parallel to the Holarctic genus *Eupalamus* Wesmael) distinctly widened, their segments 3 and 4 wider than long. Red; the following white: coxae I and II predominantly, coxae III extensively dorsally, ventrally on inner side, and laterally on inner side toward apex, trochanters I and II (except a black-and-red patch on dorsal side), apex of trochanters III; tarsi II and III blackish, tarsi I dark red-brown; tip of femora II and III and of tibiae III narrowly infuscated; tibiae I and tip of femora I and II yellowish in front.

Wings.—Nervulus postfurcal; areolet irregularly rhomboidal.

Abdomen.—Structure as described for the genus. Color as described above.

Male

White on orbits broadly interrupted on temples and at apex of cheeks, sometimes also narrowly on vertex; black patch on face sometimes lacking; basic color of entire first tergite black; apical margins of anterior tergites not yellow-tinged; in addition to yellow anterior side of tibiae I and tips of femora I and II, yellow are: anterior side of tibiae II, of metatarsus I, of apical third of femora I and II, and the ventral side of femora I and II more or less extensively; otherwise as in female.

Flagellum.—With elongate narrow tyloids on segments 7-14, the longest on segments 9-11 nearly reaching from bases to apices of segments. Uniformly black; scape ventrally white.

Note

The quite extraordinary, bizarre structure of the flagellum of the holotype suggests the possibility that it could be a freak of nature. On the other hand, the fact that the tarsi too display an unusual dilatation and abbreviation, and that all the appendages seem to be in perfect symmetry and well proportioned, strongly convey the impression of a normally developed insect with specialized antennae and legs.

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