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**INSECTS-PARASITES OF THE NUN-MOTH (LYMANTRIA MONACHA L.)
IN BYELORUSSIA
A.M. TERESHKIN**

Institute of Zoology, BSSR Academy of Science, Minsk

According to literary data and our investigations the nun-moth is parasitized within its habitat by 163 insect species where of 126 species are treated as primary and 37 - as hyperparasites (Table).

Table

The total number of species of nun-moth parasites, recorded within area of the host.

	Primary parasites	Hyperparasites	Total
HYMENOPTERA	<u>59</u>	<u>34</u>	<u>93</u>
<i>Ichneumonidae</i>	39	21	60
<i>Braconidae</i>	12	3	15
<i>Chalcididae</i>	0	1	1
<i>Pteromalidae</i>	0	5	5
<i>Torymidae</i>	0	2	2
<i>Eulophidae</i>	2	1	3
<i>Eurytomidae</i>	0	1	1
<i>Trichogrammatidae</i>	2	0	2
<i>Scelionidae</i>	4	0	4
DIPTERA	<u>67</u>	<u>3</u>	<u>70</u>
<i>Bombyliidae</i>	0	1	1
<i>Muscidae</i>	3	0	3
<i>Sarcophagidae</i>	19	0	19
<i>Tachinidae</i>	45	0	45
<i>Phoridae</i>	0	2	2

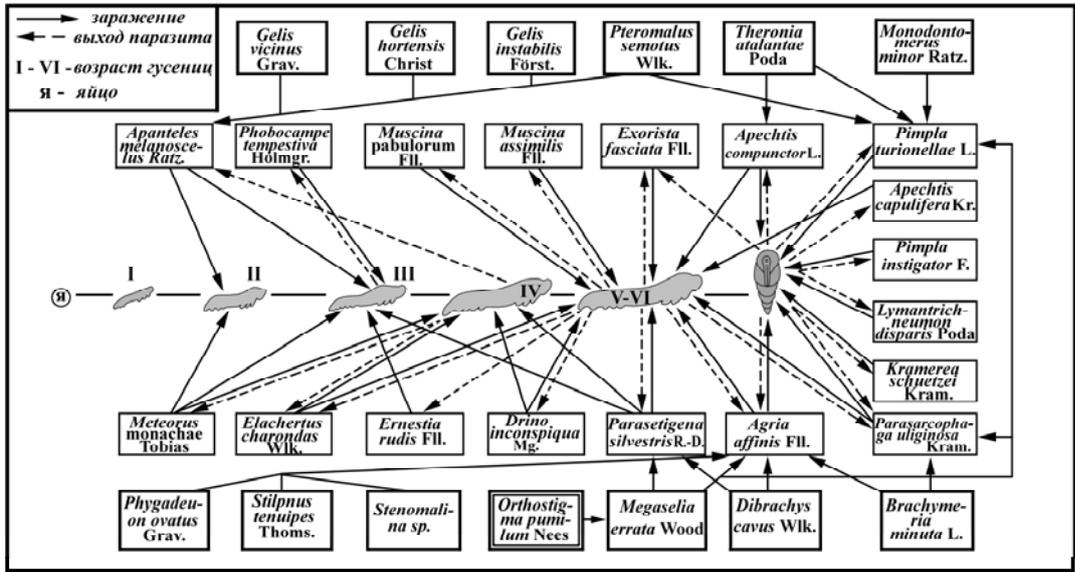
The study of the nun-moth-infested areas located in the pine forests of Byelorussia were performed from 1978 till 1984. It revealed a complex of parasites represented by 31 insect species from 10 families of the Hymenoptera and Diptera orders.

♥ A.M.Tereshkin. 1991,
ISBN 5-12-003316-4 Vorträge d. XII, SIEEC, Kiew, 1991.

Interrelations between parasite species and developmental stages of host are shown in the drawing. The complex of parasites is characterized by absence of egg parasites and species infesting the first-instar caterpillars. The insects-parasites attack caterpillars in the second instar, which are infested by the braconids *Apanteles melanoscelus* Ratz. and *Meteorus monachae* Tobias passing through one generation on the host and completing development in the fourth-instar caterpillars. When the nun-moth caterpillars reach the third instar, the intensive infestation of the host by principal parasite - tachinid *Parasetigena silvestris* R.D. begins, which in turn finishes development in the V-VI-instar caterpillars. The maximum species variety of nun-moth-infesting parasites is recorded on the V-VI-instar caterpillars. The species *Apechthis* are the only insects among 5 species of hymenopterous parasites developing in pupae, that attack both the caterpillars at the last instar and the pupae of the host and complete development in the last. Most of sarcophagids infested both the last-instar caterpillars and host pupae, preferring the latter.

Six species of primary parasites showed the signs of hyperparasite attack. The greatest number of hyperparasite species was recorded in sarcophagid *Agria affinis* Fll., infested by 6 species, in braconid *Apanteles melanoscelus* Ratz. - by 4 species and in ichneumonid *Pimpla turionellae* L. - 3 species. Most of revealed hyperparasites infested primary parasites directly on caterpillars and nun-moth pupae. Also, a single recorder third-order parasite, or the braconid *Orthostigma pumilum* Nees, developing in the phorid *Megaselia errata* Wood and completing development in their puparia, is quite synchronous. Asynchronous hyperparasites *Phygadeuon ovatus* Grav. and *Stilpnus tenuipes* Thoms. infested sarcophagid in forest litter sites.

The majority of hyperparasites passed through one generation on primary parasites and it was only *Pteromalus semotus* Wlk. that passed through the first generation on *Apanteles melanoscelus* and second - on *Pimpla turionellae* larva. From 13 species there were 4 hyperparasite species that completed development by the next year after infestation and hibernated in host body. *Brachymeria minuta* L. and its hosts *Parasarcophaga uliginosa* Kram. and *Agria affinis* Fll. had most synchronous developmental cycles. The bulk of parasites issued after hibernation in puparium by the onset of the next nun-moth generation parasitized by sarcophagids.



Interrelations between parasite species and the nun-moth

The complex of nun-moth insects-parasites within the host habitat and that of parasites recorded on the territory of Byelorussia, are both characterized by polyphagy and occasionally by oligophagy of species, by abundance of random parasites having several generations per year and requiring additional hosts for successful reproduction. In some reproduction areas throughout republic the species number is from 9 to 21 due to diversity of forest vegetation. From 18 species of primary parasites seven species were observed in all infested areas as a regular consorts of the nun-moth. They were *Parasetigena silvestris* R.-D. (Tachinidae), *Agria affinis* Fll., *Parasarcophaga uliginosa* Kram. (Sarcophagidae), *Apanteles melanoscelus* Ratz. (Braconidae), *Pimpla turionellae* L., *P. instigator* F., *Apechthis compunctor* L. (Ichneumonidae). Four of them - *Parasetigena silvestris*, *Agria affinis*, *Parasarcophaga uliginosa*, *Pimpla turionellae* were the most important in decreasing nun-moth abundance, and ichneumonid *Pimpla turionellae* was to change habits in response to host density and distribution and hence, varied in plantations with host abundance. Only the tachinid *Parasetigena silvestris* is oligophagous among above mentioned species, all the rest are widely polyphagous. The infection of nun-moth by parasites was very intensive at peak of host abundance and most intensive at the start of its reduction.