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LABORATORY STUDIES OF THE FOOD SELECTION OF SOME PREDATORS OF BARK BEETLES (*COLEOPTERA: SCOLYTIDAE*)

Introduction

In the study of the entomophages of bark beetles much attention has been paid to the species which supply food for predators and parasites. In the food selection, however, many researchers consider a few other factors more essential than the systematic category of the bark beetle species. Entomophages have developed a certain specialization towards the species and other taxa of trees (Nuorteva, 1959b; Morge, 1961; Krivosheina, Mamaev, 1966; Negrobov, Stackelberg, 1971; Зиновьев, 1957, 1959; Ковалев, 1974), the thickness of bark (Nuorteva, 1959a; Харитонова, 1972; Коломиец, Богданова, 1980), moisture and other microclimatic conditions (Nuorteva, 1959a; Morge, 1961; Krivosheina, Mamaev, 1966; Зиновьев, 1959; Негробов, 1971; Ковалев, 1974), the size of the xylophages and their galleries as well as the character of the latter (Зиновьев, 1959; Никитский, 1971б; Ковалев, 1974; Яновский, 1976) and the phenology of the xylophages (Ковалев, 1974; Яновский, 1976). The factors given above account for the occurrence of different entomophages in the galleries of various bark beetle species.

Many insects treated as bark beetle entomophages also feed on other xylobionts, other entomophages among them. As to *Heteroptera*, the larvae of *Scoloposcelis pulchella* Zett. suck out the larvae of *Medetera* sp. (Арефин, 1975) and *Aulonium ruficorne* Ol. (Mendel et al., 1990). The larvae of *Raphidia* sp. (*Raphidioptera*) feed on the eggs, larvae, pupae and even adults of many entomophages. H. Wichmann (1957) has emphasized the destroyal of the eggs of *Thanasimus formicarius* L. and *Medetera* spp.

It is known about *Coleoptera* that the larvae of *Thanasimus* sp. feed on the larvae and pupae of parasitic *Hymenoptera* (Lovaszy, 1941; Hedqvist, 1963) and *Medetera* spp. (Nuorteva, 1959a, 1959b) as well as on the larvae of the species of *Nitidulidae* (Escherich, 1923). According to B. M. Mamaev (Мамаев, 1977), the larvae of the species of *Cleridae* feed on the larvae of all insects in experimental conditions. On the other hand, the destroyal of the larvae of *Thanasimus* sp. by the larvae of *Nitidulidae* has been observed (Ekstein, 1921 in Escherich, 1923) as well as the destroyal of the larvae of *Th. substriatus* Gebl. by the adults of *Paromalus flavicornis* Hbst. (Арефин, 1975). The larvae and adults of *Cylister lineare* Er. eat the larvae and pupae of *Coeloides abdominalis* Zett. (Арефин, 1975). *Tachys nanus* Gyll. can feed on small larvae of *Cucujidae* and *Colydiidae* (Никитский, 1971а) while the larvae of *Pytho depressus* L. eat the larvae of *Medetera* spp. and *Xylophagus* sp. (Харитонова, 1972).

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Feeding on entomophages occurs also in *Diptera*. The larvae of *Medetera striata* Parent eat immature individuals of *Aulonium ruficorne* Ol. (Mendel et al., 1990). The larvae of *Medetera* sp. have been observed to eat the larvae of *Thanasimus formicarius* L. (Воронцов, Харитонова, 1971) and those of *Diptera* and *Hymenoptera* (Beaver, 1966). The larvae of *Xylophagus cinctus* Deg. feed on several *Coleoptera* and *Diptera* (Krivosheina, Mamaev, 1966; Криволуцкая, 1965). The larvae of *Phaonia gobertii* Mik can feed to an essential extent on the larvae of *Medetera* spp. (Nuorteva, 1959a, 1959b).

The entomophages of bark beetles have also displayed cannibalism. Such data have been found in the following species: *Thanasimus formicarius* L. (Istrate, Ceianu, 1976; Воронцов, Харитонова, 1971), *Th. substriatus* Gebl. (Арефин, 1974), *Rhizophagus grandis* Gyll. (Voolma, 1991), *Raphidia* sp. (Wichmann, 1957), *Xylophagus* spp. (Krivosheina, Mamaev, 1966), *Medetera aldrichii* Wh. (De Leon, 1935; McGhehey, Nagel, 1966), *M. signaticornis* Lw. (Kolubajiv, Srot, 1958), *Medetera* spp. (Nuorteva, 1959b; Beaver, 1966; Negrobov, Stackelberg, 1971; Зиновьев, 1957; Арефин, 1975). The mutual relations of xylobionts have been characterized expressively by M. Nuorteva (1959a), viz., "A war of all against all is going on under the bark".

The present paper is an attempt to examine the mutual relations of entomophages in laboratory conditions, and to find out whether the insects known as predators of bark beetles have a preference to them as compared to other entomophages.

Methods

In the experiments carried out by us the xylobionts were kept in glass vials of the diameter of 2 cm and the height of 5.5 cm. The vials were filled with frass gathered from bark beetle galleries to 1/3 of their volume. The vials were tightly closed with rubber corks, and kept in the vertical position in the dark at 18—20 °C.

Two entomophages or an entomophage together with a larva, pupa or callow adult of a bark beetle were put in every vial. The results of the experiments were registered once a day. When the inspection of the vial revealed that both insects were alive and not damaged, the vial was opened only for a short time for ventilation. In other cases, the contents of the vial was poured out for a thorough inspection. Dried frass was replaced by fresh one. The experiment was considered finished when one of the insects had been killed by the other or had perished for other reasons. The same was done after a larva had molted or pupated, an adult had emerged or a certain time had passed since the beginning of the experiment. The assignment of this time caused difficulties in some variants, viz., when the predator killed its prey in a very few days in some experiments and much later in others, while in some cases they lived together even for several months.

We proceeded from the assumption that the time passing until the extermination of the prey might give us an opportunity to explain the food selection of predators. Both the predators and their preys were of various sizes, and often we lacked any data on their feeding before the experiment. This is why the experiments were not differentiated as to which extent the predator fed on its prey, i.e., whether it was eaten entirely or partially. To evaluate the differences in the time needed to exterminate different preys, the duration of the experiment was divided into intervals of one or several days. The differences were evaluated with the aid of χ^2-criterion, using the formula (Закс, 1976)

$$\chi^2 = 2 \sum_i n_i \ln\left(\frac{n_i}{\tilde{n}_i}\right),$$

where n_i is the frequency of experiments (empirical distribution) in which an insect exterminated the other during the period i, $\tilde{n}_i$ is the expected frequency of such experiments. In some variants there were several possibilities to choose the intervals of time. In such a case the zero-hypothesis (the time up to the extermination of two species of preys by the predator is not different) was considered rejected when $\chi^2 \geqslant \chi^2_{cr}$ at least in one time selection (χ^2_{cr} is a critical value taken from the Table).

Results and Discussion

Scoloposcelis pulchella Zett.

201 experiments were made with the larvae of *S. pulchella* Zett. The larvae of this species fed on the larvae and pupae of bark beetles (*Ips typographus* L., *Hylurgops palliatus* Gyll., *Polygraphus polygraphus* L., *Pityogenes chalcographus* L.), *Medetera* sp., and parasitic *Hymenoptera*. They themselves served as preys for the larvae of *Thanasimus* sp. and the larvae and adults of *Nudobius lentus* Grav. The results of the experiments with a greater number of replications have been presented in Table 1.

Table 1

The number of xylobionts exterminated by the larvae of *Scoloposcelis pulchella* Zett. in our experiments

Xylobionts	Time until the extermination of the xylobionts (days)										Number of experiments
	1	2	3	4	5	6	7	8	9	Mean	
Larvae of *Scolytidae*	19	6	6	0	1	0	0	0	1	1.9	33
Larvae of *Medetera*	34	6	0	0	1	0	0	1	0	1.4	42
Larvae of *Hymenoptera*	15	6	1	2	0	0	1	2	0	2.3	27

These experiments did not reveal any significant difference in the time passing until the extermination of the larvae of bark beetles and *Hymenoptera* by the larvae of *S. pulchella* Zett. ($\chi^2 = 5.14$, $\chi^2_{cr} = 7.81$, $P = 0.95$). However, there was a great difference in the time needed to kill the larvae of bark beetles and *Medetera* sp. ($\chi^2 = 8.28$, $\chi^2_{cr} = 7.81$, $P = 0.95$) and, respectively, the larvae of *Hymenoptera* and *Medetera* sp. ($\chi^2 = 6.36$, $\chi^2_{cr} = 5.99$, $P = 0.95$). As the larvae of *Medetera* sp. were killed during the shortest period of time, i. e., 1.4 days on the average (Table 1), it can be said that in their food selection the larvae of *S. pulchella* Zett. preferred the larvae of *Medetera* sp. to those of both *Hymenoptera* and bark beetles.

Nudobius lentus Grav.

393 experiments were carried out with the adults of *N. lentus* Grav. and 207 with its larvae. The adults of this predatory *Coleoptera* fed on the larvae and pupae of bark beetles (*I. typographus* L., *H. palliatus* Gyll., *P. polygraphus* L., *P. chalcographus* L.), and parasitic *Hyme-*

noptera, the larvae of *S. pulchella* Zett., *Hypophloeus linearis* F., *Nemosoma elongatum* L., *Medetera* sp. and *Phaonia* sp., and also the callow adults of *I. typographus* L., *P. chalcographus* L. and *H. linearis* F.

When the adults of *N. lentus* Grav. and the larvae of *Thanasimus* sp. were kept in the same vial, *N. lentus* Grav. killed *Thanasimus* sp. in 16 experiments, the opposite result was observed in 5 experiments. These two insects lived together for a long time — for 11 days on the average. The adults of *N. lentus* Grav. revealed cannibalism. While two adults could live in one vial for a long time, the adults ate up the larvae and pupae most frequently already during the first day.

It becomes clear according to the results presented in Tables 2 and 3 that the experiments made with the adults of *Nudobius lentus* Grav. did not reveal any significant difference in the time needed to kill the larvae and pupae of bark beetles, the larvae of bark beetles and *Medetera* sp., the pupae of bark beetles and the larvae of *S. pulchella* Zett., the pupae of bark beetles and the larvae of *Hymenoptera* as well as the larvae of *S. pulchella* Zett. and *Hymenoptera*. The larvae of bark beetles, however, were exterminated by the adults of *N. lentus* Grav. within a

Table 2

The number of xylobionts exterminated by the adults of *Nudobius lentus* Grav. in our experiments

Xylobionts	Time until the extermination of the xylobionts (days)							Number of experiments
	1	2	3	4	5	6	Mean	
Larvae of *Scolytidae*	55	4	1	1	0	0	1.1	61
Pupae of *Scolytidae*	39	8	2	0	0	0	1.2	49
Larvae of *S. pulchella*	18	3	2	0	2	1	1.8	26
Larvae of *Hymenoptera*	16	4	2	2	1	0	1.7	25
Larvae of *Medetera*	50	3	0	0	0	0	1.1	53

Table 3

Comparison of the time until the extermination of the xylobionts by the adults of *Nudobius lentus* Grav. with the aid of the χ^2-criterion (numerator — χ^2, denominator — χ^2_{cr}, $P=0.95$)

Xylobionts	Larvae of *Scolytidae*	Larvae of *S. pulchella*	Larvae of *Medetera*	Larvae of *Hymenoptera*
Pupae of *Scolytidae*	2.78 / 5.99	4.43 / 5.99	5.17 / 3.84	4.70 / 5.99
Larvae of *Scolytidae*		6.65 / 5.99	0.66 / 3.84	8.51 / 7.81
Larvae of *S. pulchella*			8.61 / 3.84	1.97 / 7.81
Larvae of *Medetera*				11.23 / 3.84

comparatively shorter time than the larvae of *S. pulchella* Zett. and *Hymenoptera*; the larvae of *Medetera* sp. were also eaten within a significantly shorter period than the pupae of bark beetles and the larvae of *S. pulchella* Zett. and *Hymenoptera*, the probability for the latter two being $P=0.99$ ($\chi^2=8.61$, $\chi^2_{cr}=6.63$) and $P=0.999$ ($\chi^2=11.23$, $\chi^2_{cr}=10.83$), respectively. This means that the adults of *N. lentus* Grav. ate first and foremost the larvae of *Medetera* sp. and bark beetles, preferring them to the larvae of *S. pulchella* Zett. and *Hymenoptera*. The larvae of *Medetera* sp. were also preferred to the pupae of bark beetles.

The larvae of *N. lentus* Grav. destroyed the larvae and pupae of bark beetles (*I. typographus* L., *H. palliatus* Gyll., *P. polygraphus* L., *P. chalcographus* L.) and parasitic *Hymenoptera*, the larvae of *S. pulchella* Zett. and *Medetera* sp., and the callow adults of *I. typographus* L. and *P. chalcographus* L. mostly during the first day. In four experiments the larvae of *N. lentus* Grav. fed on the larvae of *Thanasimus* sp. but in five experiments they themselves served as preys. The experiments with two larvae of *N. lentus* Grav. in one vial resulted in a rapid extermination of one individual by the other, viz., during the first day in 7 experiments and the second day in one experiment.

The results of the experiments with a greater number of replications reveal no significant difference in the time until the extermination of the larvae and pupae of bark beetles and the larvae of *Medetera* sp. and parasitic *Hymenoptera* by the larvae of *N. lentus* Grav. (Tables 4 and 5).

Table 4

The number of xylobionts exterminated by the larvae of *Nudobius lentus* Grav. in our experiments

Xylobionts	Time until the extermination of the xylobionts (days)					Number of experiments
	1	2	3	4	Mean	
Larvae of *Scolytidae*	42	2	1	0	1.1	45
Pupae of *Scolytidae*	23	2	1	1	1.3	27
Larvae of *Medetera*	42	2	1	0	1.1	45
Larvae of *Hymenoptera*	18	3	2	0	1.3	23

Table 5

Comparison of the time until the extermination of the xylobionts by the larvae of *Nudobius lentus* Grav. with the aid of the χ^2-criterion (numerator — χ^2, denominator — χ^2_{cr}, $P=0.95$)

Xylobionts	Larvae of *Scolytidae*	Larvae of *Medetera*	Larvae of *Hymenoptera*
Pupae of *Scolytidae*	$\frac{1.38}{5.99}$	$\frac{1.38}{5.99}$	$\frac{0.49}{5.99}$
Larvae of *Scolytidae*		$\frac{0}{5.99}$	$\frac{3.18}{5.99}$
Larvae of *Medetera*			$\frac{3.18}{5.99}$

***Thanasimus* sp.**

445 experiments were carried out with the larvae of *Thanasimus* sp. The larvae of this species usually killed the larvae, pupae and callow adults of bark beetles (*I. typographus* L., *I. amitinus* Eichh., *H. palliatus* Gyll., *P. polygraphus* L., *P. chalcographus* L., *Dryocoetes* sp.), the larvae and pupae of parasitic *Hymenoptera*, and the larvae of *Medetera* sp. during the first day. The larvae of *Thanasimus* sp. also fed on the larvae of *Scoloposcelis pulchella* Zett., *Hypophloeus linearis* F. and *Epuraea* sp.; the process, however, took more time than that with the insects mentioned above. In three experiments out of five the larvae of *Thanasimus* sp. ate the larvae of *Pytho depressus* L. and fell their victims in two. When the larvae of *Thanasimus* sp. and *Cylister lineare* Er. were kept in one vial, it was *Thanasimus* sp. that was eaten up in two experiments, and *C. lineare* Er. in the other two.

The larvae of *Thanasimus* sp. revealed cannibalism: a larva killed the other in 28 experiments out of 31; in 10 cases it happened during the first day.

Table 6

The number of xylobionts exterminated by the larvae of *Thanasimus* sp. in our experiments

Xylobionts	Time until the extermination of the xylobionts (days)						Number of experiments
	1	2	3	4	5	Mean	
Larvae of *Scolytidae*	88	4	2	1	0	1.1	95
Pupae of *Scolytidae*	69	6	0	0	1	1.1	76
Adults of *Scolytidae*	16	3	1	0	1	1.4	21
Larvae of *Medetera*	58	1	2	0	0	1.1	61
Larvae of *Hymenoptera*	26	1	0	0	0	1.0	27

Table 7

Comparison of the time until the extermination of the xylobionts by the larvae of *Thanasimus* sp. with the aid of the χ^2-criterion (numerator — χ^2, denominator — χ^2_{cr}, $P=0.95$)

Xylobionts	Pupae of *Scolytidae*	Larvae of *Scolytidae*	Larvae of *Medetera*	Larvae of *Hymenoptera*
Adults of *Scolytidae*	2.92 / 5.99	4.28 / 7.81	6.03 / 5.99	4.56 / 3.84
Pupae of *Scolytidae*		1.65 / 5.99	3.62 / 5.99	0.97 / 3.84
Larvae of *Scolytidae*			0.87 / 5.99	0.50 / 3.84
Larvae of *Medetera*				0.07 / 3.84

According to the results presented in Tables 6 and 7 there was no great difference in the time needed for the extermination of the larvae, pupae and callow adults of bark beetles by the larvae of *Thanasimus* sp. The same can be said about the larvae and pupae of bark beetles and the larvae of *Medetera* sp. and *Hymenoptera.* An essential difference, however, existed as to the time before the destroyal of the callow adults of bark beetles and the larvae of *Hymenoptera* as well as the callow adults of bark beetles and the larvae of *Medetera* sp. The larvae of *Thanasimus* sp. preferred the larvae of *Medetera* sp. and *Hymenoptera* to the callow adults of bark beetles.

***Phaonia* sp.**

105 experiments were made with the larvae of *Phaonia* sp. One larva under inspection reared into an adult — *Ph. gobertii* Mik.

The larvae of *Phaonia* sp. fed on the larvae and pupae of bark beetles (*I. typographus* L., *H. palliatus* Gyll., *P. polygraphus* L., *P. chalcographus* L.) and the larvae of *Medetera* sp. and parasitic *Hymenoptera.* Most of these insects were killed during the first day. The larvae of *Phaonia* sp. themselves were eaten up within a short time by the adults of *N. lentus* Grav.

38 experiments were carried out with the larvae of *Phaonia* sp. and the pupae of bark beetles. In 36 of them the pupae of bark beetles were annihilated during the first day and in the remaining two during the second day, i. e., within 1.1 days on the average. In all 49 experiments with the larvae of *Medetera* sp. the latter were eaten up during the first day. No essential difference was found in the time needed to kill the pupae of bark beetles and the larvae of *Medetera* sp. ($\chi^2=3{,}39$, $\chi^2_{cr}=3.84$, $P=0.95$).

***Medetera* sp.**

In 694 experiments made with the larvae of *Medetera* sp. 6 adults developed from the larvae, all of them *M. signaticornis* Lw.

The xylobionts used in the experiments can be divided into four groups: 1) the insects eaten by the larvae of *Medetera* sp. in all experiments (the larvae and pupae of *I. typographus* L., *H. palliatus* Gyll., *P. polygraphus* L. and *P. chalcographus* L.); 2) the insects eaten by the larvae of *Medetera* sp. only in some experiments (the larvae and pupae of parasitic *Hymenoptera*, the pupae of *Hypophloeus linearis* F. and *Epuraea* sp.); 3) the insects that lived together with the larvae of *Medetera* sp. without killing each other (the larvae of *H. linearis* F.

Table 8

The number of xylobionts exterminated by the larvae of *Medetera* sp. in our experiments

Xylobionts	Time until the extermination of the xylobionts (days)										Xylobionts alive at the end of experiments	Number of experiments
	1	2	3	4	5	6	7	8	9	Mean		
Larvae of *Scolytidae*	63	11	2	2	1	2	1	1	0	1.6	0	83
Pupae of *Scolytidae*	58	10	3	0	0	0	1	0	0	1.3	0	72
Larvae of *Hymenoptera*	4	7	0	0	0	0	0	0	1	—	12	24

and *Epuraea* sp., the pupae of *Nudobius lentus* Grav.); 4) the insects that fed on the larvae of *Medetera* sp. (the larvae and adults of *N. lentus* Grav., the larvae of *Scoloposcelis pulchella* Zett., *Cylister lineare* Er., *Pytho depressus* L., *Thanasimus* sp., and *Phaonia* sp.).

Cannibalism was observed in the larvae of *Medetera* sp.; however, as it was not precisely known to which species the larvae belonged, it might not have been cannibalism but the destroyal of one species by another. In 16 out of 67 experiments a larva of *Medetera* sp. ate up the other within 1—56 days. In other experiments one of the larvae perished due to some other reason, or both of them remained alive up to the end of the experiment whose maximum duration was 151 days.

The results of the experiments with a greater number of replications (Table 8) demonstrate that the time needed for the larvae of *Medetera* sp. to kill the larvae and pupae of bark beetles was not very different ($\chi^2=3.29$, $\chi^2_{cr}=7.81$, $P=0.95$). A significant difference, however, could be observed in the time to kill the larvae of bark beetles and *Hymenoptera* ($\chi^2=29.80$, $\chi^2_{cr}=13.82$, $P=0.999$) and the pupae of bark beetles and the larvae of *Hymenoptera* ($\chi^2=36.72$, $\chi^2_{cr}=13.82$, $P=0.999$). Hence, the larvae of *Medetera* sp. preferred the larvae and pupae of bark beetles to the larvae of *Hymenoptera*.

The facts given above reveal that several predators known as the entomophages of bark beetles feed on both the bark beetles and entomophages. Of all the observed predators it were only the larvae of *Medetera* sp. that ate other entomophages only in a few experiments, and that clearly preferred the larvae and pupae of bark beetles to the larvae of *Hymenoptera*. Among the rest of the entomophages it were only the adults of *Nudobius lentus* Grav. that preferred the larvae of bark beetles to those of *Scoloposcelis pulchella* Zett. and *Hymenoptera*.

It was unexpected that the larvae of *S. pulchella* Zett., *N. lentus* Grav., *Thanasimus* sp., and *Phaonia* sp. did not destroy the bark beetles within a shorter period than the entomophages. Moreover, the larvae of *S. pulchella* Zett. preferred the larvae of *Medetera* sp. to the larvae of bark beetles and *Hymenoptera*. The adults of *N. lentus* Grav. preferred the larvae of *Medetera* sp. to the pupae of bark beetles and the larvae of *S. pulchella* Zett. and *Hymenoptera*. The larvae of *Thanasimus* sp. preferred the larvae of *Medetera* sp. and *Hymenoptera* to the callow adults of bark beetles. Consequently, the larvae of *Medetera* sp. belong to the insects preferred to others by the xylobiont predators. The comparison of the results of the remaining variants of the experiments did not reveal any clear-cut food selection by the predators.

Keeping two entomophages in one vial gave us the possibility to observe certain relation between the size and mobility of the insects with the results of the experiments. Small and immobile or slowly moving insects, e. g., the larvae and pupae of *Hymenoptera*, the larvae of *S. pulchella* Zett., *Medetera* sp., *Hypophloeus linearis* F., and *Epuraea* sp. were eaten by bigger individuals (the larvae and adults of *N. lentus* Grav., the larvae of *Thanasimus* sp. and *Phaonia* sp.) or more mobile ones (the larvae and adults of *N. lentus* Grav., the larvae of *Thanasimus* sp. and *S. pulchella* Zett.). In case of two relatively mobile insects of more or less the same size (the larvae and adults of *N. lentus* Grav., the larvae of *Thanasimus* sp., *Pytho depressus* L., and *Cylister lineare* Er.) the results varied in different experiments.

The mutual relations between the predators in natural habitats can be somewhat different from those in experimental conditions. This is

due, among other factors, to the differences in the conditions of motion and hiding in the galleries under the bark and in the frass in the vial. This is especially valid for the relations of the larvae of *Medetera* sp. with others. The larvae of *Medetera* sp. often dig into the phloem, and move between the phloem fibres. Thanks to such a way of motion they are not so easily caught by the predators in nature. On the other hand, it is probable that from the phloem fibres the larvae of *Medetera* sp. can also attack some insects that could not be endangered by them in our experiments.

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ÜRASKLASTE (*COLEOPTERA*: *SCOLYTIDAE*) ENTOMOFAAGIDE TOITUMISE LABORATOORSEST UURIMISEST

Ürasklaste entomofaagidena tuntud röövputukaid (*Nudobius lentus* Grav. vastseid ja valmikuid ning *Scoloposcelis pulchella* Zett., *Thanasimus* sp., *Phaonia* sp. ja *Medetera* sp. vastseid) kasvatati klaasprobiirides ürasklaste näripurus. Igasse probiiri asetati kaks entomofaagi või entomofaag koos üraski vastse, nuku või noormardikaga. Ohvrite hävitamiseks kulunud aja alusel hinnati, missugust toitu röövputukad eelistavad.

Kõik nimetatud röövputukad toitusid nii ürasklastest kui ka entomofaagidest. *Medetera* sp. vastsed olid ainsad, kes selgesti eelistasid toituda ürasklaste vastsetest ja nukkudest. *Medetera* sp. vastsed ise kuulusid nende putukate hulka, keda ksülobiontsed röövputukad meelsamini sõid. *N. lentus* Grav. vastsetel ja valmikutel ning *Thanasimus* sp. ja *Medetera* sp. vastsetel täheldati kannibalismi.

Хейно ЫУНАП

ЛАБОРАТОРНОЕ ИЗУЧЕНИЕ ВЫБОРА ПИЩИ НЕКОТОРЫМИ ХИЩНИКАМИ КОРОЕДОВ (*COLEOPTERA*: *SCOLYTIDAE*)

Личинок и имаго *Nudobius lentus* Grav., личинок *Scoloposcelis pulchella* Zett., *Thanasimus* sp., *Phaonia* sp. и *Medetera* sp., известных в качестве хищников короедов, содержали в стеклянных пробирках в буровой муке короедов. В каждую пробирку было помещено по два энтомофага или энтомофаг вместе с личинкой, куколкой или имаго короеда. По времени, которое хищникам требовалось для уничтожения жертв, оценивали, какую пищу хищники предпочитают.

Все вышеуказанные хищники питались как короедами, так и энтомофагами. Личинки *Medetera* sp. были единственными хищниками, которые явно предпочитали питаться личинками и куколками короедов. Сами же личинки *Medetera* sp. наиболее быстро поедались другими видами подкорных хищников. У личинок и имаго *N. lentus* Grav. и личинок *Thanasimus* sp. и *Medetera* sp. зарегистрирован каннибализм.