

A NOTE ON LAELIUS SP., A PARASITE OF THE CARPET BEETLE ANTHRENUS SCROPHULARIAE (L.) (Hymenoptera, Bethyidae)

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On August 3, 1941, a mass of floor sweepings containing beetle larvae was sent in to the entomological laboratory at Kamloops, from Mazama, Osprey Station, about 30 miles north-west of Penticton; Mr. G. Allen Mail very kindly handed the debris over to me. It contained dermestid larvae and the chewed-up remains of several adult *Anthrenus scrophulariae* Linn. I kept the mass caged and secured over a dozen fresh beetles of this species.

Amongst the trash were a number of old larval skins in which beetles had pupated; three of these skins contained a mass of silk enveloping four silken pupal cases lying in the same axis as the dermestid skin. Attached to one mass, and partly enveloped in the silk, was the remains of a tiny dark hymenopteron while another lay nearly detached in the rubbish. Both wasps were somewhat battered, but were obviously parasites of these beetles.

I sent the specimens to Dr. G. S. Walley who turned them over to Dr. O. Peck. In his reply, Dr. Peck says, in part, ". . . this hymenopteron (Bethyid) agrees closely with the description of *Laelius occidentalis* Whittaker although somewhat lighter in colour. *L. occidentalis* has been known, up until now, only from the type; this was taken on a window in Chilliwack, B.C., and was described in the Trans. Ent. Soc. London (1927-28): 387-8 (1 fig.) . . . nothing is known of its biology except through other species of the genus. In this regard it is perhaps well for me to draw your attention to the method of pupation. Your letter of August 19th states that there are three or four pupal cases in each larva, suggesting internal parasitism which is contrary to the external parasitism in this genus (Vance and Parker,

1932, Proc. Ent. Soc. Wash. 34:1-7). However, Mr. W. J. Brown tells me that *Anthrenus* pupates within the last larval skin so that an external parasite may well appear to be internal."

Now the last larval skins of *Anthrenus*, in which the cocoons occurred, were intact so I could not see how the *Laelius* grubs could be external feeders without destroying this exuviae; in the one specimen I have left, there is no sign of the pupal case of the beetle. In that priceless book "Entomophagous Insects", Clausen, speaking of the attacks of *Laelius* adults on their hosts, says that they sting their victims—"The females of the genus *Laelius*, which attack the larvae of Dermestidae, bite away the covering of long hairs on the venter of the abdomen before depositing their eggs (Howard, 1901) . . . "In *Laelius anthrenivorous* Trani, the female . . . chews the throat, apparently with the object of injuring the cervical ganglion. The complete process of subduing the host may require several hours." For reference, I quote this passage from The Insect Book by Leland O. Howard, pp. 34-35, "Life History of a Parasitic Wasp":

"The *Laelius* is a little, black, slender, active, four-winged fly; and the female, when it finds one of these dermestid larvae, at once jumps upon its back and clings firmly, in spite of the struggles of the victim. As soon as the poor beetle larva quiets down a bit, *Laelius* places herself crosswise over the thorax and, curling her abdomen around under the side, inserts her sting just behind the second or third pair of legs, paralyzing the dermestid instantly, the sting apparently having entered one of the large thoracic nerve ganglia. Then the parasite relaxes its hold and begins

pulling the legs and hairs of its victim with its mandibles, its antennae vibrating in a contented manner. The pulling of the legs is evidently an attempt on the part of the parasite to see if the stinging has done its work with perfect effect. Having satisfied herself by all sorts of tests that the paralysis is complete, she proceeds to lay an egg, attaching it to the skin of the dermestid on the under side of the body, first pulling out the hairs carefully so that the egg can be firmly attached to the skin. If in the course of this operation, or even before the egg is laid, another dermestid larva comes within her range of perception, she leaves the first victim, mounts and stings the second, or even a third or a fourth, each time testing the completeness of the paralysis with the utmost care. Before attaching the egg she thrusts her sting into the spot several times, apparently making an orifice through which the larva, after hatching, can thrust its head, or which it can at least enlarge easily so as to insert its head. The egg is oval, soft, translucent, about a third of a millimeter long, apparently has no peduncle, and is not very firmly attached to the skin of the dermestid. From one to six eggs are laid upon a single victim. In a few days the larvae hatch, yellow in color and very indistinctly jointed. Immediately on hatching, their mouths are closely applied to the skin of the paralyzed dermestid and they begin to grow, not so rapidly as the somewhat similar *Euplectrus*, which will be described in a succeeding chapter, but still rather rapidly, reaching full growth in from ten to fourteen days. When full grown, a group of these larvae with their heads inserted at a central point, look not unlike the petals of a curious

flower growing out of the shrivelled dermestid larva. When only one *Laelius* larva occurs upon a host it sometimes enters the sucked-dry skin and spins its cocoon within it, but generally the white, rather loose, silken cocoons are spun outside the skin of the dermestid, which shows large holes where the parasitic larvae have been at work."

Now it is true, even as Mr. W. J. Brown mentioned, that *Anthrenus* pupates within the last larval skin; this skin takes on the form of a broad oval, sharply pointed at each end like a canoe very wide in the middle, with the bluntly-oval, delicately skinned pupa lying inside it. This is precisely the form of the exuviae of parasitized *Anthrenus* that I have but instead of the beetle puparium, four silken *Laelius* cocoons lie inside the split-open last larval skin which is otherwise intact. If the *Laelius* larvae had been external feeders, this last larval skin would have been shrivelled or at least, punctured; it is intact. Therefore in this instance at least, it appears as if the *Laelius* larvae had attacked the recently-formed pupa of the beetle. At first this did not seem feasible because the summer brood of *A. verbasci* (for comparison) is a rapid one and the pupa hardens quickly, but development of this beetle through this (1941) winter shows that the stage of the perfectly soft, white, helpless *Anthrenus* pupa, lying exposed in the widely-split-open last larval skin, may extend for over three weeks; at such a time a *Laelius* could do what she liked with it and her grubs could feed upon it externally, leaving the larval skin intact, and form their silken cocoons in this skin.

I am greatly indebted to Dr. O. Peck for his comments on this insect and for suggesting that this record may be worth publishing.

***Agabus ontarionis* Fall.** This dytiscid water beetle was unknown from British Columbia until June 8, 1941, when G. J. Spencer took a series of ten-eral adults. His specimens are from

Bachelor Swamp, between Pass Lake and Lac du Bois, high on the ranges north of Kamloops. A month or two later the meadowy swamp had dried up.—Hugh B. Leech.