

THE YOUNG LARVA OF ARSENURA RICHARDSONI, DRUCE.

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The eggs of this rare species were kindly sent me from Tacubaja, Mexico, by Mr. O. W. Barrett. The food-plant of the caterpillar was unknown to him. Heretofore we have only had the figures of the mature larva of three species of this genus, and four sketches of the caterpillar of *A. armida*, the better known species of this interesting genus, which ranges from Mexico to Brazil. The larva figured by Madam Merian, Stoll, Burmeister, and by Peters, is represented as being smooth, without any tubercles, horns, or hairs. The partly grown larva, when about one-half grown, is drawn as having a pair of high horns on the prothoracic and a longer pair on the third thoracic segment, and a caudal horn on the 8th segment, also a shorter median horn on the 9th abdominal segment. Peters* states that this armature is retained until the last moult. He also figures the caterpillar of *A. aspasia*, H. Sch., which has four thoracic and a caudal horn; one would infer from his brief account that this larva was fully fed, since he figures the pupa, but it may be found to belong to the penultimate stage. He also figures the larva of *O. xanthopus*, Walk. The small young (in stage III.?) has a pair of long, slender filamental metathoracic horns about half as long as the body, and a caudal filamental horn of nearly the same length. The older larva has no caudal horn, but retains the two thoracic appendages, which are about a quarter as long as the body. He does not positively say whether this is the full-fed larva or not, but the pupa (subterranean) is figured.

We had from a study of this genus (also of *Rhescyntis* and *Dysdæmonia*), referred these moths to the subfamily Agliinæ, the venation being similar to that of *Aglia tau*. And it is a matter of no little interest to find that the young freshly hatched larvæ, now for the first time described, is somewhat similar in armature to that European genus, whose nearest allies belong to the South American fauna.

Stage I.—Length, 4 mm. Head large and round, wider than the body, and shaped as in *Adelocephala*. The body is rather thick, and tapers somewhat to the end. The first thoracic segment is rather wide,

*Die Heteroceren-Raupen (und Puppen) des H. T. Peters' schen manuskriptwerkes; Biologische Beiträge zur Brasilianischen Schmetterlings-fauna, Neudamm (1898)—1901.

but not so wide as the head; the front edge is somewhat raised, *i. e.*, flares up, and bears a remarkably complex armature. The two dorsal tubercles are broad, thin (in a fore-and-aft sense), and divided into seven heads or subtubercles, one or two of which are smaller and shorter than the others, each digitiform tuberculet bearing a long spinulate black seta; the setae are of nearly equal length, and nearly as long as the entire main or master tubercle. As compared with those of *Eacles imperialis*, Stage I., these tubercles are much thinner, and are 7-headed instead of being 2-headed, *i. e.*, simply forked.

Below on the front edge of each side is a smaller tubercle of the sub-dorsal series about one-third as long and large as those of the dorsal pair, ending in three subtubercles, each of which bears a black spinulated seta. Just below the spiracle is a small, simple, infrspiracular tubercle, and below this a low minute 3-headed one. Behind this series of four tubercles (on each side) is a dusky, narrow, chitinous band or rudimentary prothoracic plate or shield, which passes down each side of the segment, not quite reaching a point opposite the spiracle, *i. e.*, not as far down as the spiracle.

On the 2nd thoracic segment are two dorsal tubercles (*i*), which are small, digitiform, 2-headed, the heads diverging. These are smaller than the corresponding pair on the 1st abdominal segment, but larger than those of the hinder pair (*ii*) on the same abdominal segment.

On the 3rd thoracic segment is a pair of enormous horns, which are slightly more than half as long as the body. They are not stiff, and easily bend over, but with a thin integument, the surface of which is crowded with short, erect spinules, some of which are conical, others blunt. These two appendages are nearly as thick as the segment is long, their greatest diameter being a little above the base; they are forked at the end, each fork being about twice as long as thick, and much rounded at the end, and giving rise to a stout spinulated seta, which is of moderate length, *i. e.*, about twice as long as the greatest diameter of the horn itself. The horns of this pair are much larger than those of *Agria tau* of the same stage, and differ in the trunk, and two branches of the fork being much thicker, while the short spinules do not give rise to a hair. It is most probable that the caterpillar moves these horns with more or less freedom, and that they are deterrent structures.

On the back of abdominal segments 1-7 are two pairs of dorsal tubercles, those of the anterior pair (*i*) digitiform, as long as the horns are thick;

they are separated by a space nearly as long as one of the tubercles themselves. Those of the second pair (*ii*) are a little wider apart, but situated close to the anterior pair, and with shorter and smaller setæ. The presence of a second pair of tubercles on the tergum, the four tubercles arranged in a short trapezoid, is a very primitive feature. I have observed them in the 1st stage of *Cerura Heterocampa*, *Macrurocampa*, and other *Notodontidæ*, as well as in *Anisota* and *Adelocephala*, but not in *Eacles*.

The caudal horn is about as thick as the metathoracic horns, the distal half fully as thick through, and the two divisions of the fork are of the same size, including the terminal setæ. It is also equally flexible, and its armature is the same, the surface being beset with microscopic conical spinules which do not end in a hair. The horn is about half as long as the anterior horns, extending a little beyond the end of the dorsal setæ.

The horn is the fused homologues of the anterior pair of tubercles of the abdominal segments in front, for directly behind its base is a pair of short tubercles of the same size and shape as those of the posterior pair.

The 9th abdominal segment is armed dorsally with a pair of separate tubercles like, in shape and size, the anterior ones on segments 1-7, but situated close together at their base. The suranal plate is triangular, about as long as broad, with three small marginal tubercles on each side, and one twice as large near the base of the plate. The surface is not tuberculated. The anal legs are flat, square, not rough and tuberculated, but bearing three small setiferous tubercles near the lower edge.

The tubercles of the subdorsal 2nd row (*ii*) are simple and digitiform, as are those of the third or supraspiracular row (*iii*). These tubercles arise from a broad base, forming a dark or reddish discoloration. The tubercles of the lower or 4th supraspiracular row (*v*, *vi*) are on the abdominal segments united at their base, those of the 2nd and 3rd thoracic segments minute and single, as usual in all *Ceratocampidæ*.

The setæ are peculiar in the microscopic spinules being stout, conical, often blunt. They are of nearly equal length, the longest one being nearly or about two-thirds as long as the segment is thick, and necessarily add very much to the defensive nature of the armature of the young larva.

The ground colour, as shown by Mr. Joutel's drawing, is a reddish ochreous, the bases of the tubercles being surrounded by light reddish brown; the tubercles are all red, the middle of the big two dorsal horns and of the caudal horn being yellowish. There are no longitudinal or transverse stripes.