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CALLIMORPHA AGAIN.

Larva of Haploa fulvicosta and notes on the male genitalia.

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The difficulty of defining species in this genus is increased by the constancy of the local forms or races. I have elsewhere referred (*Ent. News*, VII., 218) to the race of *fulvicosta* which Mr. O. D. Foulks has discovered at Stockton, Md. Mr. Foulks was so kind as to send me over 100 hibernated larvæ, from which I bred a long series of moths. The type form is large, the size of *reversa* and *colona*, both wings immaculate yellowish-white, head, collar and the tips of the abdominal rings ochre-yellow.

In *var. A* the fore wings are nearly pure white, the hind wings much yellower, suggesting *conscita*, though never so dark as that form.

In *var. B* the ground of fore wings is white, marked faintly with ochreous bands in which the full pattern of *colona* can be traced; the costa is narrowly brown-black; the hind wings are pale ochreous. This looks like a washed-out *colona*, related to it in the same way as *var. A*. is to *conscita*.

Var. C is only slightly yellowish on both wings, the hind wings scarcely at all darker; fore wings marked with various streaks and spots of brown-black, especially along the costa and margins, all more or less distinctly connected by ochreous shades, in which the full pattern of *reversa* can be read. This is a washed-out *reversa*, stained with the creamy yellow so characteristic of the Maryland race.

All these forms insensibly intergrade. I believe that this is practically the extent of variation in this Maryland race. There are no specimens that are true *colona*, *conscita* or *reversa*, but these forms are all strongly suggested. The view naturally presents itself that these names apply to local races rather than to distinct species. In his work on Callimorpha (*Proc. U. S. Nat. Mus.*, 1887, p. 338) Prof. J. B. Smith describes the genitalia of *colona*, *Lecontei*, *contigua*, *reversa* and *vestalis*. The differences shown are at best slight, and Prof. Smith assumes the

forms which he figures to be constant. In fact, they are not so. I have drawn the right side pieces of four males of the Maryland race of *fulvicosta*. They are shown in figures 1 to 4, viewed from within $\times 50$, the dorsal angles down. These are not specimens selected for their variation, but are all that were mounted. The only selection applied was in taking the poorest specimens for dissection. Fig. 1 shows the upper angle produced and rounded, the lower angle much more produced; fig. 2 shows the lower angle not produced, but simply rounded; fig. 3 both angles produced, the upper the most so; fig. 4 both angles produced, but the lobes of quite different shapes. There is as much variation in these specimens of *fulvicosta* as in all of Prof. Smith's "species," and I am of the opinion that the genitalia are valueless as a means of specific distinction in Haploa. However, I add drawings of most of the other forms and also reproduce Prof. Smith's figures.

It is possible that the larvæ, when fully known, will be of more help, yet this is doubtful, as they seem to possess all the same habits and hence are not markedly different in their colours. Very full descriptions are needed, especially of the mature larva, to test these points. The following observations were made on the larvæ sent by Mr. Foulks and on the young ones bred out of the eggs from the moths.

Normal number of stages six; hibernation in the fourth or fifth. The young larvæ that were selected for observation passed two interpolated stages between the normal II. and III. and died before reaching stage IV.

Egg.—Of the shape of two-thirds of a sphere, scarcely conoidal, the base flat; smooth, shining, rather dark yellow; diameter .6 mm. Reticulations obscure, visible in a strong reflected light, very narrow, linear, irregularly hexagonal, the cell areas flat, uniform, no shadows.

Stage I.—Head high, bilobed, the lobes blackish brown, clypeus pale, mouth brown; width .3 mm. Body pale yellowish, tubercles dusky pearly; hair short, stiff, white. Setæ single, normal, no subprimaries; feet pale. The larvæ grow considerably, becoming long and slender, the tubercles surrounded narrowly by brown.

Stage II.—Head black, shining, clypeus whitish, jaws brown; width .45 mm. Body whitish, warts rather small and with the shields deep shining black; hairs not numerous, but forming true warts, short, bristly, black. A wide space between tubercles i. suggests a dorsal band. Warts each narrowly edged with brown, most distinctly subdorsally, no connected marks. Subventral hairs pale.

Stage III. (interpolated)—Head shining black, clypeus and mouth brown; width .55 mm. Warts large, black, hairs short, bristly, black and white. Body elongated, broadly whitish between warts ii., fading to smoky black in the region of wart iii.; below this another pale band, marked with yellow, transversely annulated streaks behind wart iv., two on each segment; subventral region shaded with brown. Leg plates black. Later the appearance is more as in the next stage, though the bands are not really defined.

Stage IV. (interpolated) — Head black; width .65 mm. Body black, a broad diffuse dorsal gray line, joining a narrower subdorsal one. Region of warts iii. and iv. yellow spotted, joining a substigmatal gray band and subventral gray marks. Warts black; hair short.

Stage V. (normal III.)—Black; head .75 mm. Pale whitish dorsal, subdorsal and substigmatal lines, the subdorsal faintest; bright yellow superstigmatal line, not perceptibly joined to the substigmatal one. Warts black.

Normal Stage V. (from Mr. Foulks; after hibernation) — Head shining black; width 1.7 mm. Body black; dorsal line broad, subdorsal faint, stigmatal broad, substigmatal fainter, yellow, traces of a line subventrally, all more or less white spotted. Essentially as in the next stage.

Stage VI.—Head and warts shining black, the latter bluish; width 2.7 mm. Body deep black, the dorsal line broad, straight, narrowly broken in the incisures and centre of the segments, yellow, darker yellow or red in the centre of each segment, faint on joint 2. Traces of a subdorsal band, broken by wart ii., whitish, mottled. Lateral band broad, indented by warts iii. and iv., broken into three or four spots on each segment by transverse black lines, yellow, irregularly stained with darker yellow, connected inferiorly by mottlings and dots with a narrow substigmatal line which is yellow, mottled, broken and runs between warts iv. and v. Traces of a subventral line between warts v. and vi. on the base of each leg. Leg plates black. Venter broadly pale gray, blackish dotted. Hair very short, inconspicuous, black or black and white, stiff, pointed, not barbed. In some individuals the subdorsal whitish dots are absent, and in some the dorsal band is distinctly marked with red; otherwise there is very little variation. Corresponds well with Saunders's description of *reversa* (CAN. ENT., I., 20), and also with Riley's of *fulvicosta* (Third Report Ins. Mo., 134). The forms *colona* and *conscita* have not been bred.

Explanation of Plate iv.

- Figs. 1 to 4.—Side pieces of male genitalia of *Haploa fulvicosta* seen from within; four examples, specimens from Maryland.
Fig. 5.—The same, *H. clymene*, specimen from Kansas.
Fig. 6.—The same, *H. reversa*, specimen from Texas.
Fig. 7.—The same, *H. colona*, specimen from Texas.
Fig. 8.—Copied from Smith's figure of *H. colona*.
Fig. 9.—Side piece of male *H. lecontei*, var. *militaris*, specimen from Iowa.
Fig. 10.—Copied from Smith's figure of *militaris*.
Fig. 11.—Side piece of *H. vestalis*, specimen from Iowa.
Fig. 12.—Copied from Smith's figure of *vestalis*.
Fig. 13.—Side piece of *H. confusa*, specimen from Northern New York.
Fig. 14.—Copied from Smith's figure labelled *confusa* on the plate, but described as *reversa* in the text.
Fig. 15.—Side piece of *H. contigua*, specimen from New York.
Fig. 16.—Copied from Smith's figure of *contigua*.

SOME ANTS AND MYRMECOPHILOUS INSECTS FROM
TORONTO.

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During the summer of 1896 I received specimens of ants collected by Mr. R. J. Crew, of Toronto, in exchange for such Coleoptera as I could find for him in my locality. He writes me that he noticed no insects with the ants other than the Coleoptera and some aphids in a nest of ants, but did not capture any.

I have found, however, upon looking them over, they contain several very interesting species of various orders: some truly myrmecophilous, some occasional, while others were brought into the nests by the ants, to be used by them for food; this will apply to a number of Hemiptera collected by *Formica subsericea*, Say.

It may appear to some who are collecting ants'-nests Coleoptera only that the finding of *Agonoderus pallipes*, Fabr., and *Otiorhynchus oratus*, L., is merely occasional. The position in which these Coleoptera are found with the ants here in Massachusetts, and the frequently finding them with various species of ants, lead me to believe that they are more than incidental or casual visitors.

I am not familiar with the scattered literature treating upon the