

ARTICLE III. — *On the Parasites of the Lesser Apple Leaf-Roller, Teras minuta* (Robs.). By CLARENCE M. WEED.

In a paper to be published in the Report of the State Entomologist of Illinois for 1886, I have discussed at length the literature and life-history of the Lesser Apple Leaf-Roller, originally described by Robinson as *Tortrix minuta*, and since re-described by Le Baron, Riley, Packard, and Zeller under the specific names of *malivorana*, *cinderella*, *vacciniivorana* and *variolana*. I have there shown that the life-history of the species when feeding upon apple is the same as when feeding upon cranberry, Dr. Riley having proved that in the latter case the species is dimorphic, — there being a yellow summer form and a gray winter form. The parasites described below were mostly bred at the Laboratory during 1886, though a few had been obtained during previous seasons. It is a little remarkable that although this leaf-roller has been so often injurious both upon apple and cranberry, and has frequently been treated of in entomological literature, there has heretofore been recorded but one species of parasite bred from it, (obtained from cranberry-feeding larvæ). Yet from the frequently recorded fluctuations in the numbers of the larvæ upon apple, it seems probable that they have been subject to parasitic attack for many years.

I desire to acknowledge my great obligations to Professor S. A. Forbes, to whose liberal-minded policy of allowing his assistants personal credit for much of the work done by them, I am indebted for the opportunity of publishing the present paper; and to Dr. C. V. Riley, who has kindly determined the generic position of the species of *Limneria*, *Cremastus*, and *Pimpla* described below.

LIMNERIA ELEGANS, sp. n.

Cocoon.—Length 6 mm. White, thin, sub-cylindrical.

Imago, ♀.—Length, 4.5 mm. Black, somewhat shining; mandibles straw-yellow, tipped with brown; palpi, white; four anterior legs rufous, with coxæ and trochanters whitish, and tips of tarsi dusky; posterior legs rufous, with coxæ (except tips) and proximal portion of trochanters black, and tips of trochanters, together with apical portion of tarsi dusky; ventrum of abdomen pale yellow anteriorly and darker posteriorly. Antennæ a little more than half as long as body, piceous, except ventral surface of the two basal joints, which are yellowish. Tegulæ whitish. Wings with nervures and stigma dull yellowish brown, former pale at base, and latter with a pale spot on proximal portion; areola entirely wanting. Scutum and scutellum of metathorax finely aciculate. Scutellum of metathorax very finely granulate; carinæ only slightly developed anteriorly, wanting posteriorly. First joint of abdomen smooth and shining, suddenly enlarging transversely about two thirds of the way back, the remaining segments having the appearance of being very finely squamulate. Ovipositor nearly half as long as abdomen.

Described from two specimens. The only other American species that has been described under the genus *Limneria*, having no areola, is *L. rufipes* Prov. (Nat. Can., Vol. VI., p. 149), from which the present species differs in the color of the stigma, ventral surface of the abdomen, anterior coxæ, etc.

LIMNERIA TERATIS, sp. n.

Cocoon.—Length 7 mm. Thin, white, nearly cylindrical in form.

Imago, ♀. — Length, 6 mm.; alar expanse, 8 mm. Black; mouth parts honey-yellow; first pair of legs pale rufous; second pair of same color, except tarsi, which are whitish tipped with dusky; coxæ and upper part of trochanters of third pair of legs black, femora pale rufous tipped with dusky, tibiæ whitish at base, then an imperfect dusky ring, then whitish again, and

tipped with a broad dusky ring, tarsi dusky, with whitish rings at the articulations; ventral surface of abdomen dull brown. Antennæ piceous, setaceous, two thirds as long as body. Tegulæ whitish. Wings subhyaline; nervures and stigma brownish black, the former pale at base, and the latter with a pale spot near where it arises; areolet petiolated. Scutum of mesothorax somewhat shining, finely granulate, with shallow punctures, and a faintly impressed longitudinal area on each side of the dorso-meson; very sparsely pubescent. Scutellum of mesothorax granulate, pubescent. Scutellum of metathorax granulate; carinæ prominent, so arranged as to enclose a sub-circular area on anterior dorso-lateral surfaces, a central pentagonal longitudinal area, the surface of which is transversely striate, and on each side of which there are two sub-triangular areas, with reticulated surfaces. Abdomen shining, with sparse, fine pubescence; first segment subcylindrical, enlarged posteriorly. Ovipositor nearly as long as abdomen.

Described from two specimens bred from *Teras minuta* in June.

Differs from *L. annulipes* Cresson in the larger ovipositor, and in the thoracic sculpture; and from *L. fugitiva* (Say) in its smaller size and black posterior coxæ.

PIMPLA MINUTA, sp. n.

Imago, ♂.—Length 5 mm. Black; tarsi, ventral surface of first two antennal joints, tegulæ and small spot just in front, first four legs (except tarsal claws of posterior pair and apical tarsal joint of middle pair), with trochanters of posterior legs, and ventrum of abdomen (except two dusky quadrangular spots on each segment), clear white. Posterior edges of middle abdominal terga whitish. Coxæ and femora of posterior legs pale rufous, latter tipped with black; posterior tibiæ white, with an imperfect dusky ring near base and a broad dusky ring at tip; first tarsal joint white tipped with black; second and third black, with white at base; the rest dusky throughout. Antennæ two thirds as long as body, setaceous, nearly piceous, the first two joints white beneath, and the under surface of the third,

fourth, and fifth lighter than the rest. Wings hyaline; nervures and stigma brownish black, paler at base; areolet moderate, sessile, sub-rhomboidal. Scutum and scutellum of mesothorax pubescent, shining, with numerous shallow punctures; scutum with two oblique impressed lines arising anteriorly on each side of the middle and meeting on the upper surface. Scutellum of the metathorax canaliculate. First joint of abdomen shining, with a prominent ridge arising anteriorly on each side of the middle and running obliquely back; between these ridges in front the segment is excavated and the sides are also somewhat hollowed out. Remaining segments punctate, pubescent.

Described from one specimen bred from *Teras minuta* in June.

This is a well-marked species, easily distinguished from those previously described.

CREMASTUS FORBESI, sp. n.

Cocoon. — Length 6 mm. Thin, whitish, sub-cylindrical.

Imago, ♀ — Length 7 mm. Black; eye orbits, mouth parts, ventrum of abdomen, and two anterior pairs of legs, honey-yellow; posterior legs approaching a chestnut color, with tips of tibiæ dusky; tarsi dusky, especially at the tips; posterior margin of abdominal terga (except first) dusky yellow. Antennæ 5 mm. long, setaceous, ventral surface nearly tawny olive. Scutum of mesothorax punctate, with a faint impressed line starting a short distance each side of the middle of the anterior margin, and running slightly obliquely to the posterior margin, being united on the medio-dorsal portion of the scutum by a broad, flattened, thickly punctured area. Scutellum of mesothorax punctate, having (in the specimen at hand) an indistinct, transverse, chestnut-colored band. Metathorax strongly sculptured; a well-developed longitudinal carina on each side of the dorso-meson, arising near the anterior margin, and running to posterior margin, the two being connected anteriorly by a transverse carina; on the outside of each of these runs another longitudinal carina, the latter being connected with the former by transverse carinæ, so as to enclose a quadrilateral area on the dorso-lateral angles of the

metathorax; another longitudinal carina on each side, below those last mentioned; a spot on the anterior margin each side of the dorso-meson shining, with scattered punctures; remainder of the dorsum transversely striate (between the carinae); sides punctate. Wings hyaline; tegulae straw-yellow; stigma of moderate size, dusky yellowish brown; veins straw-yellow at base, becoming dusky outwards. First abdominal segment shining, long, slender, slightly enlarged posteriorly; remaining segments pubescent. Ovipositor as long as abdomen.

Described from one specimen bred from *Teras minuta*, 13th June, 1886. Dedicated to Professor S. A. Forbes.

CLINOCENTRUS AMERICANUS, sp. n.

Cocoon.—Length 3 mm.; width 1 mm. Whitish, thin, without loose silk; usually formed within the cocoon of the host.

Imago.—Length, ♂ 1.7 mm.; ♀ 2–2.1 mm. ♂, ♀. Reddish or yellowish brown, with a black head, dark brown or piceous antennae (except at the base), and more or less black on the dorsum of the thorax, especially at the margin, and the anterior and posterior portions of the abdomen. Legs honey-yellow, with tips of tarsi dusky. Mandibles brownish, tipped with black; palpi whitish. Ovipositor whitish tipped with dusky. Antennae as long as body, basal joints testaceous. Wings subhyaline, tegulae and basal portion of veins testaceous; middle portion of costa dusky; stigma and remaining nervures dull brownish white. Mesoscutum with sparse pubescence, smooth, except for two impressed oblique lines which form a V-shaped marking, the base of the V being on the medio-posterior portion of the scutum, and the side of the V extending cephalo-laterad. Mesoscutellum smooth, sub-triangular. Scutellum of metathorax reticulate. Tergum of first abdominal segment with front slightly excavated; longitudinally rugose; terga of two following segments finely rugulose. Ovipositor exerted, nearly as long as abdomen.

The male of this species is usually darker in color than the female and much more slender in form.

Described from many specimens bred from *Teras minuta* in June.

I propose the above specific name for this species, because it is, I believe, the first insect of the genus to be described in America.

APANTELES CACŒCLÆ Riley.

As I have elsewhere noted*, a single specimen of this species was bred from *Teras minuta* during May, 1886.

MACROCENTRUS DELICATUS Cresson.

Professor Riley has recorded† the breeding of this species from the second brood of larvæ of *Teras* feeding upon cranberry in New Jersey.

*Notes on some Illinois Microgasters. Bull. Ill. St. Lab. Nat. Hist., Vol. III., Art. I., p. 5.

†U. S. Dept. Agr., Div. Ent., Bull. 4, p. 25.