NOTES ON GALERUCELLA NYMPHAEAE L., THE POND-LILY
LEAF-BEETLE (COLEOP.)BY HARRY B. WEISS AND ERDMAN WEST.
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This species occurs throughout New Jersey on the yellow pond-lily (*Nymphaea advena* Ait.) which is common along the lower Delaware River and adjacent ditches and tide-water streams. During the seasons of 1919 and 1920, it was particularly abundant at Monmouth Junction, Westville and several other places in New Jersey, defacing the leaves and flowers and rendering them ragged and unsightly.

Blatchley₁ states that the adult probably hibernates and this appears likely as adults have been taken during the middle and last of May and early June. The yellow eggs are deposited on the upper surfaces of the leaves in clusters of 18 to 20, each egg being stuck on end to the leaf surface and close to its neighbor. MacGillivray₂ states that he found clusters containing as few as 6 eggs and gives the number as ranging from 6 to 20. These hatch in about a week, each larva emerging from the upper half of the egg and feeding takes place in colonies on the upper layers of the leaf tissue, resulting in irregular, unsightly, denuded areas. As the larvae become larger they separate and feed independently on either side of a leaf.

In the latitude of New Jersey, many become full-grown about the third week of June, pupation taking place on the upper or under leaf surface. This stage lasts about one week, the beetles appearing the last of June and first part of July. There are at least two generations in New Jersey. During the middle and last of June it is possible to find all stages of the insect except eggs.

Chittenden₃ records the adult as attacking plants belonging to botanical families not at all related to its normal food plants such as aquatic species of *Nymphaea*, *Sagittaria*, *Brasenia*, *Nuphar* and mentions basket willow and beans. He further states that it frequently has received mention under the name *Galeruca sagittariae* Gyll, and is evidently of foreign origin, being found abundantly in northern Europe, and Siberia. In this country it has been recorded from Texas, California, Oregon, Indiana and occurs from the Hudson Bay region southward to the District of Columbia and Virginia. It is, therefore, a well distributed species. Both Schaupp₄ and MacGillivray₅ have described the early stages and the latter's descriptions being the most detailed are given below together with additional material in brackets which it was thought desirable to add.

Egg.—(Length 0.9 mm. Width 0.5 mm.) "Oblong or short cylindric with smoothly, obtusely rounded ends; yellow, shining." (The surface is sculptured with hexagonal markings having depressed centres.)

Larva. (Length 7 to 8.5 mm. Width about 1.8 mm.). Head black; the antennae mere tubercles, three jointed; the labrum three-sided, the distal and lateral margins in the form of a continuous convex curve constituting one side, the remaining sides formed by the proximal end of the labrum with an angle

1. The Coleoptera of Indiana, p. 1169.
2. Bull. 68, N. Y. State Mus., 1903, pp. 325-326.
3. Bul. 54, U. S. D. A. Bur. Ent., p. 58, 1905.
4. Bul. Brook. Ent. Soc., Vol. VI, p. 54.
5. Loc. cit.

on the median line, the distal margin with a row of comb-like bristles attached to the ental surface, two long discal and two long lateral setae, the two groups forming a transverse line, and four marginal setae; the mandibles tridentate, the two inner teeth subequal, the outer one much shorter; the thorax and abdomen black above except at the sutures and with fine whitish fuscous lines dividing the black into distinct areas—there is such a line on the meson of the notum of the three thoracic segments and a line on each abdominal segment dividing it into two parallel transverse bands, the posterior being the longer; at the end of each of these bands a subquadrangular spot, and laterad of each anterior spot another subequal in size which bears the spiracle, and laterad of the spiracle a much larger spot as long as the width of the segment," (bearing two comparatively long hairs; the last abdominal segment bears a row of long fine hairs on the posterior edge and the dorsal black spots on this segment are fused.) "The sternum of the thorax and abdomen pale except a spot on either side of the thorax laterad of the legs and homodynamous spots on each abdominal segment (all of the foregoing spots bearing one or two hairs,) a spot on either side mesad of the spots just described (each abdominal spot bears a short hair,) and a median broad spot; and the last ventral abdominal segment with a well developed proleg, legs blackish except at the sutures." (In many specimens the lines dividing the segments are decidedly yellow giving the larva a banded appearance dorsally. In others these lines and the lines dividing the black areas are indistinct and the entire dorsal surface appears black. The ventral surface is usually yellowish and the median brownish to black spots vary in area.)

Pupa. "Length (5 to) 7 mm. Width, (2.6 to) 4 mm. Black except the sternum of the thorax and abdomen, the apical segment of the abdomen which is covered by the cast skin of the larva, the basal segments of the legs, and a median tergal line which are yellowish; the legs, wing-pads and antennae not closely joined to the body; the very young pupae are lighter (yellowish at first) in colour."

Adult. This was described by Linnaeus in 1758 (Syst. Nat. p. 376). The following redescription is by Blatchley⁶.

"Oblong-oval, narrower in front, subdepressed. Piceous brown, finely pubescent; thorax dull yellow, usually with three piceous spots; side margin, apex and epipleura of elytra yellowish; under surface and antennae piceous, the basal joints of the latter partly dull yellow; legs pale. Thorax twice as wide as long, sides rather strongly angulate; front angles small, prominent, hind angles nearly obsolete; disk with median narrow depression and a larger one each side which is densely punctured and piceous; surface otherwise smooth or with a few coarse punctures. Elytra slightly broader behind, margins distinctly flattened, surface coarsely and rather closely punctate. Length 4.5-6 mm.

DeGeer as early as 1775 gave an account of this insect in *Memoires pour servir à l'histoire des Insects*, vol. V, pp. 326-329, Pl. 10, figs. 1-6, and it has received attention since then from other foreign authors.

Chittenden⁷ states that arsenicals are quite effective remedies in checking the beetle on willow and for aquatic plants suggests flooding together with a few drops of oil on the water to destroy the floating insects. If this is not possible

6. Loc. cit.

7. Loc. cit.

the arsenical could be applied to the infested plants either as a dust or as a spray. If applied as a spray, care should be taken not to use a pressure strong enough to submerge the pads. Plant parts well out of the water could be coated readily. It was noted that this insect was absent in areas where the pond-lilies were entirely covered by the tide each day.

A NEW GRACILARIA INJURIOUS TO AVOCADO (LEPID.).

BY AUGUST BUSCK, WASHINGTON, D.C.

Gracilaria perseæ, n. sp.

Labial and maxillary palpi ochreous shaded on the underside with black. Face light golden ochreous. Head and thorax purplish ochreous. Antennæ whitish with black annulations. Forewings light ochreous with a purplish sheen especially on dorsal half and apex; a few black scales on costa at basal fifth, a small black dot on costa near the middle, and a few scattered black scales at apical fifth seem to be constant in all the specimens before me; there are also a few scattered black scales on the dorsal margin and the extreme apex is slightly clouded with dark scales. Cilia very dark nearly black. Hind wings blackish fuscous with black cilia. Abdomen blackish fuscous above

Fig. 22.—Harps of *Gracilaria perseæ* (1), *G. burserella* (2) and *G. violacella* (3).

light golden yellow on the underside. Anterior tibiae thickened with blackish-brown scales; posterior coxæ and femora golden yellow with broad, black fasciae; all tarsi white with extreme tip of each point touched with light brown.

Habitat.—Miami, Florida. U. S. N. M. Type No. 23515.

Bred from leaves of Avocado (Aquacate), *Persea perseæ*, at Miami, Florida, during July by Mr. G. F. Mozzette, who states that the species is seriously destructive to the young growth. The larvæ are typical of the genus; they first make a small mine between the veins of the young leaves, and subsequently fold the tip or the sides of the leaf downwards. The cocoon is white, narrow, oblong, and is spun in a fold on the leaf.

The species is typical of the genus; in coloration it is similar to and intermediate between *G. violacella* Clemens and *G. burserella* Busck, but the male genitalia are so different in the three species as to indicate that they are not truly closely allied. The outline sketches of the harps suffice to separate the three species. The vinculum of *perseæ* is unusually short for the genus, and the harps are straight oar-shaped (Fig. 1), very different from the deeply-notched harps of *burserella* (Fig. 2), and the broadly-curved harps of *violacella* (Fig. 3); the last form is the more common in the genus.

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