SOME SPECIES OF CALLIGRAPHA.

[Coleoptera, Chrysomelidæ.]

By Frederick Knab.

In those forms of *Calligrapha* in which the pale elytra show a pattern composed of sutural stripes, humeral lunules, and a number of irregular spots, the specific limits have been largely a matter of individual opinion. This must continue to be the case while collectors and systematists are content to dispose of such questions by a furtive examination of the specimens that chance puts in their way. The writer has long been dissatisfied with the accepted definition of the species and for some years has observed these beetles in nature whenever opportunity offered. It has become constantly clearer that distinct species are confused under the same specific name and that the definition of the species will have to be entirely reformulated. While the writer is not prepared to do this at present it seems advisable to characterize a few of these forms and it is hoped that this will stimulate others to give their attention to this group. Determination of the food-plants of the different species is the key to a proper understanding of them; unfortunately our knowledge in this direction is still very incomplete. Furthermore, it is only with large series before him that the student can hope to gain a mastery of these difficult forms.

The two species described here as *rhoda* and *rowena* group with *scalaris* LeConte. There seems to be no doubt as to the form LeConte had before him when he described *scalaris*. It is the one which occurs upon the elm (*Ulmus americana* L.) and the linden (*Tilia americana* L.) and the form most frequently referred to under the name *scalaris*. In *Calligrapha scalaris* the pronotum and the elytral pattern are bright metallic green, sometimes with a strong bluish cast; the form is rather elongate and depressed and the size averages larger than any of the other species. The surface appears shining; the punctuation of the pronotum is moderately coarse and close at the sides, fine and sparse upon the disc, though subject to considerable variation. The punctures limiting the elytral pattern are rather fine, the markings are flat, and show little if any convexity. The punctures upon the disc are very fine and well separated. The white ground-color of the elytra shows a silvery luster in sexually mature specimens.

Calligrapha rhoda, new species.

Form subovate, convex. Color of the body and elytral pattern dark olivaceous, submetallic; the legs, antennæ, and palpi ferruginous yellow.

Ground-color of the elytra creamy white; in sexually mature specimens the greater part of the disc becomes suffused with dull red and those parts that remain pale take on a yellowish-silvery luster. The red color occupies the posterior two-thirds of the disc, beginning behind the humeral lunule; a broad outer margin and narrow margins around the dark pattern are silvery. The elytral pattern consists of a double sutural stripe, to which are joined a heavy arcuate stripe along the middle third and a spot near the apex; the humeral lunule is double to beyond its middle and its inner branch extends obliquely close to the upper end of the arcuate mark; the humeral lunule encloses two spots which are sometimes joined; close to the outer margin near its middle is a small spot and there are a number of irregular small spots scattered over the disc. The epipleura are pale, with their outer and inner margins ferruginous. The punctures limiting the elytral pattern are coarse and close and the markings are distinctly convex. The punctuation of the pale surface is coarser and closer than in *C. scalaris*. The head and pronotum are finely alutaceous and coarsely punctured; the punctures of the pronotum are finer upon the disc, although nearly as dense as at the sides; towards the sides there is a depression of confluent punctures. The labrum is ferruginous and there is a ferruginous spot upon each mandible. The claws are but slightly divergent. Length, 7 to 8 mm.

Food plant: *Corylus americana* Walt.

Localities: West Springfield (21 May, 1903, 15 June, 1901, 13 July, 1902, 5 August, 1900, Knab), Chicopee (24 July, 1892, Knab), Westfield (5 September, 1903, Knab), Wilbraham (19 June, 1903, Knab), Notch Road, Mount Holyoke (24 June, 1898, Knab), Massachusetts; Canobie Lake (2 July, 1892, G. Dimmock), New Hampshire; Port Huron (June, Hubbard and Schwarz), Michigan; Marshall County (11 June, 1903, W. S. Blatchley), Indiana; Glen Ellyn (5 June, 1904, A. B. Wolcott), Illinois; Central Illinois (April, 1883, O. S. Westcott); Beaver Dam (W. E. Snyder), Milwaukee County (June, F. Rauterberg, 20 July, 1900, C. R. Brown), Wisconsin; Olmstead County, Minnesota (C. N. Ainslee); Creve Coeur Lake, St. Louis County (17 July, 1903, G. W. Bock), Missouri; Onaga (3 June, 1901, F. F. Crevecoeur), Kansas; Deer Park (4 July, Hubbard and Schwarz), Maryland.

Type—Catalogue No. 12571, U. S. National Museum.

Cotypes in the collections of the U. S. National Museum and of the author.

This species feeds exclusively upon the hazel, both in the imago and the larval states, and as far as known it is the only species of *Calligrapha* found upon this plant. While the elytral

pattern is practically identical with that of *C. scalaris,* the present species has a facies which makes it at once recognizable. The form is shorter and much more convex than *scalaris* and the elytra, on account of the coarser punctuation, look much rougher. The pronotum and the elytral markings are a very dark olive, while in *scalaris* these parts are bright green or blue-green. The red color upon the elytra is only apparent upon sexually mature specimens and disappears after death. The claws are less widely divergent than in *scalaris.* The species occurs but sparingly upon its food-plant.

Calligrapha rowena, new species.

Form subovate, convex. Color of the body and elytral pattern dark blue-green, submetallic; the legs, antennæ, and palpi ferruginous yellow; labrum ferruginous. Ground-color of the elytra yellow; in sexually mature specimens the greater part of the disc is bright orange-red, the anterior third and a broad outer margin golden. The elytral pattern consists of a double sutural stripe to which is joined, behind the anterior third, a short and heavy arcuate stripe; before the posterior third is a detached arcuate spot which represents the posterior branch of the complete arcuate stripe of *C. rhoda* and *C. scalaris;* the spots near the apex, which in *rhoda* are usually large and joined to the sutural stripe, are either obsolete or small and detached. The humeral lunule is short and very heavy, double to beyond the middle; it encloses a heavy, roughly lunate or rounded spot which is sometimes fused with it. There is a large spot on the outer margin near its middle; the spots upon the disc are small and vary in number from 3 to 8 upon each elytron, while in *rhoda* there are 10 or 11. The punctures limiting the elytral pattern are coarse and the markings are more or less convex. The punctuation of the disc is distinctly coarser than in *rhoda* and consequently the surface is uneven. The epipleura are pale with their outer margins ferruginous. The head and pronotum are alutaceous, but more shining than in *rhoda* and coarsely punctured. The punctures of the pronotum are rather sparse and those upon the disc but little finer than the ones at the sides; half-way down the sides is a depression with more or less confluent punctures and bounded by a more or less impunctate area. The claws are more divergent than in *rhoda.*

Length, 6.5 to 8.5 mm.

Food-plant unknown.

Localities: Montreal, Province of Quebec (6 June, 1899, 10 June, 1906, 23 June, 1907, G. Chagnon); Hamilton, Province of Ontario (from C. W. Leng); Massachusetts (from

J. D. Sherman, Jr.); New Britain (Knab), Bridgeport (June, 1895, Knab), Connecticut; Pennsylvania (National Museum collection).

Type—Catalogue No. 12572, U. S. National Museum.

Cotypes in the collections of the U. S. National Museum and of the author.

This species is of striking appearance on account of the reduction, both in number and size, of the discal spots of the elytra and in fresh specimens this is enhanced by the brilliant red discal color. It is even more robust in form than *rhoda*.

Calligrapha amelia, new species.

Closely related to *Calligrapha philadelphica* Linnæus. Form elongate-ovate, convex. Color of the body and elytral pattern dark blue-green, submetallic; the legs, antennæ and palpi ferruginous yellow; labrum, and the mandibles in part, ferruginous. Ground-color of the elytra white with slight creamy tinge and, in sexually mature specimens, with silvery luster. The elytral pattern is similar to *C. philadelphica*. The sutural stripe is very narrow, usually green but shading to ferruginous in some specimens. The subsutural stripe is broader, detached, and does not attain the apex; in some specimens it is abbreviated or interrupted posteriorly. Outside of the subsutural stripe, medianly, is a long arcuate stripe which is usually more or less broken in the middle. The humeral lunule is usually broken into four spots, of which the posterior oblique one is the largest; the spot enclosed by the lunule is rather large, rounded or roughly lunate. The spots upon the disc are heavy, more or less rounded, and about 12 to 15 in number upon each elytron. The punctures limiting the pattern are moderately coarse, the markings slightly convex; the punctuation of the disc is rather coarse and sparse. The epipleura are pale with ferruginous outer margin. The head and pronotum are obsoletely alutaceous, coarsely but not densely punctured; the punctures on the sides of the pronotum tend to form pits and those upon the disc are but little finer.

Length, 6.5 to 9 mm.

Food-plant: *Alnus rugosa* (Du Roi) K. Koch (*serrulata* Willd.).

Localities: Washington, D. C. (1 June, Hubbard and Schwarz, 20 May, 1906, Knab); Fort Washington (1 July, Hubbard and Schwarz), Hyattsville (27 August, Knab), Maryland; Pimmit Run (5 June, 1904, Knab), Glen Carlyn (30 May, 1906, Knab, 14 July, 1908, Heidemann), Great Falls (27 June, 1909, Knab), Virginia; White Sulphur Springs, West Virginia (A. Fenyes); New Jersey (J. B. Smith); Staten Island, New York.

Type—Catalogue No. 12573, U. S. National Museum.

Cotypes in the collections of the U. S. National Museum and of the author.

This species averages larger than *C. philadelphica;* it is a little more robust and the markings are heavier. The head and pronotum are shining blue-green, while in *philadelphica* they are distinctly alutaceous and the color is a duller brassy green. In *philadelphica* the inner lunule of the humerus is nearly always complete, gently arcuate and more slender; it encloses two widely separated slender spots and all the markings are more delicate.

C. amelia, in the imago and larva states, occurs exclusively upon the alder *(Alnus rugosa); C. philadelphica* lives only upon *Cornus* (*Cornus stolonifera* Michx., Massachusetts, G. Dimmock; *C. amomum* Mill., vicinity of Washington, D. C., Knab). In the vicinity of Washington these two species may often be found in close proximity upon their respective food-plants, a natural result of the habits of these two plants.

The writer is well aware of the extensive literature which deals with the species of the group to which the foregoing belong. However, until our knowledge is more complete, any attempt to handle this literature critically would only add to the existing confusion. Certain it is that the numerous misidentifications, not only of the beetles but of the food-plants as well, have made the subject a most complicated one.

NOTES ON MICROLEPIDOPTERA, WITH DESCRIPTIONS OF NEW NORTH AMERICAN SPECIES.

By August Busck.

Aristotelia placidella Zeller.

Gelechia placidella Zeller; Verh. Zoo.-Bot. Gesellsch. Wein, XXIV, p. 441; pl. 12, fig. 11, 1875.

Aristotelia natalella Busck; Proc. U. S. Nat. Mus., XXVII, p. 756, 1904.

Gelechia placidella Zeller, from Vancouver Island, has hitherto been overlooked and is mentioned neither in my Gelechiid revision nor in Dyar's List of North American Lepidoptera.

The type in Lord Walsingham's collection, which I have now examined, proves the above synonomy.

Sophronia roseicrinella, new species.

Second joint of labial palpi rosy white, exteriorly mottled transversely with fuscous; the well-developed brush dusky; terminal joint