

PSYCHE.

NOTES AND DESCRIPTIONS OF SOME NORTH AMERICAN LIBELLULINA.

SYNOPSIS OF NEUROPTERA, SECOND EDITION.

BY HERMANN AUGUST HAGEN, CAMBRIDGE, MASS.

1. CELITHEMIS EPONINA Drury.

I first established *Celithemis* for this species which is found everywhere in the United States, east of the Rocky Mountains from Minnesota to Florida and Texas; it also occurs in Cuba. It is rather variable in the spots of the wings.

2. CELITHEMIS FASCIATA Kirby.

Kirby, Trans. zool. soc. London, 1889, v. 12, p. 326, pl. 52, f. 2. Two males, one immature from Georgia. In the exhibition of Canadian insects (1886) in London, England, a young male said to be from Toronto, Ontario, was labelled by myself *C. anna* (no description), after two males from Enterprise, Fla. The female is unknown to me. I believe this species is near to *C. eponina* of which I have before me a large number from Enterprise. The discovery of the female is still needed.

3. CELITHEMIS ELISA Hagen.

I have placed this species in my Synopsis (1861, p. 182) in *Diplax* followed by *D. ornata* and *D. amanda*, of which

I had then before me very insufficient material. Walsh directly referred *D. elisa* to *Celithemis* and Kirby (l. c., p. 275) proposed the same for *D. ornata* and *D. amanda*. I have now before me a large material ranging from Canada to Georgia. The species is very remarkable in having the tips of all the wings blackish as in *C. fasciata*; all the other spots are more or less variable.

4. CELITHEMIS BALTEATA Hagen.

I have described the young female from western Texas in my Synopsis (1861, p. 140) among *Tetragoneuria* with the remark, "Does it belong to this genus?" Later I sent this female and the only male from Cuba (Poey) to DeSelys and he answered "a *Libellula* but difficult a placer." I have since received both sexes and fully colored specimens from Key West, Fla. There is no doubt but that the species belongs here and stands, though a little larger, between *C. elisa* and *C. ornata*. By a curious chance this species is omitted from my Synopsis of 1875. A new and full description is needed.

5. *CELITHEMIS ORNATA* Ramb.

Instead of two specimens mentioned in my Synopsis (1861, p. 182) I have a large number from the eastern parts of the United States and I have been told by Mr. Calvert that it has been collected in Maine.

6. *CELITHEMIS AMANDA* Hagen.

I have in my Synopsis (1861, p. 183) described this species after the type (♀) of Burmeister from Georgia (his *Libellula pulchella*, a name used long before) as the next to *D. ornata*, having only two series of discoidal areolets. I have now before me a larger material, some collected with *D. ornata* and I think it very probable that both forms may be the same species and perhaps may be found in South America also.

The other species *C. superba* given in my Synopsis, (1861, p. 148) of which I had then only a female is now referred to a separate genus, *Pseudoleon* Kirby. There are believed to exist four species, of which I can not now give an opinion. I believe that it is very near to *Celithemis*.

7. *LIBELLULA INCESTA* Hagen.

Teneral male, Front yellowish, superiorly darker with a black transversal band before the eyes; labrum yellow, margin black; labium paler, the outer and inner margin finely black; vertex brown, paler in the middle; occiput brown; eyes black behind two yellow spots on the inferior half of the border; prothorax brown, two spots in the middle and the posterior lobe yellowish

white. Thorax brown with a yellowish white band extending between the wings to the abdomen; sides yellowish white with an inferior blackish band above the legs, formed by four triangular spots; suture between meso- and metathorax with a superior blackish line; thorax beneath whitish, the black spots extending down between and behind the legs. Abdomen blackish brown with a broad yellowish band each side, paler and larger on segments 2-3, united on 1 and on the base of 2; very near to the outer border of the segment, which is finely black, on segments 3-9; segment 10 yellow with two black spots in the middle; abdomen beneath yellow, margin of the segments finely bordered with black; venter brown; appendages black, the inferior brown in the middle. Legs black, pale at the base, anterior femora pale brown above nearly to tip. Antecubitals 15-18 (12-13 ala inf.); postcubitals 11-13; $3\frac{1}{2}$ -4 areolets beneath pterostigma; 3 discoidal areolets; after the triangle sometimes 4; 1-2 transversals in the triangle. Length 53 mm.; abdomen 36 mm.; ala sup. 41 mm.; ala inf. 83 mm.; pterostigma $5\frac{1}{2}$ mm.; appendages $2\frac{1}{2}$ mm.; cap. 8.

HABITAT: Two males, Milton, Massachusetts July 1873 H. K. Morrison.

There are no differences between *L. incesta* and *L. lydia* except that the basal line and nodal point are fuscous black in the latter; *L. incesta* is generally smaller; the pterostigma is shorter. When I described *L. incesta* (Synopsis, 1861, p. 155) I had before me only two very old males from Carolina. Now

I have a dozen of both sexes young and adult from Canada to Florida. With an equally large material of *L. lydia* and of *L. axillena* it seems to be certain that all belong to the same species.

8. *DIPLAX RUBICUNDULA* Say.

Libellula rubicundula Say, Journ. acad. nat. sci. Philad. 1839, ser. 1, v. 8, 26, 14.

Diplax rubicundula Hagen, Syn. Neur. N. A. 1861, 176, 6—Proc. Bost. soc. nat. hist. 1873, v. 15, 267, 17; 377, 10; 1875, v. 18, 73, 3—Scudd. ibid, 1866, v. 10, 219.

Rufescent front and mouth parts yellowish; a narrow black band before the eyes between vertex and front; vertex brown, paler on tip, villous; eyes rufescent in life, behind olivaceous with two transversal darker marks; antennae black; prothorax rufous, hind border with two large rounded lobes, densely ciliated on border, thorax rufous, (♂) greenish brown (♀), sides same color more yellowish beneath; legs black, anterior femora sometimes the intermediate and posterior, luteous beneath at the base; abdomen long, slender, sanguineous (adult male), or yellowish with a maculose lateral black stripe, except at the base (♀); appendages, rufescent; superior ones of the male longer, apical half recurved, apex acute, beneath upon the middle with a stouter tooth, denticulated anteriorly; inferior appendage shorter, triangular, exceeding somewhat the tooth of the superior ones, the apex a little excised; the genital hamulus rather long, very bifid, the external

branch broader, triangular; the internal one a little longer, narrow, subincurved; the genital lobe short, triangular; the apex narrow; anterior plate widely notched on the tip; penis with two shorter pale apical setae; appendages of female cylindrical, pointed; vulvar lamina small, triangular, the base inflated, bifid by a channel to the base, forming two conical pointed, recurved lobes; concave inside; wings hyaline, the extreme base yellowish; pterostigma quadrangular, fuscous, at both sides paler; membranule white; antecubitals 7 (8); postcubitals 7 (7-9); 3 discoidal areolets.

Length 32-37 mm; alar expanse 50-58 mm.; pterostigma 2 mm.

HABITAT: Massachusetts summer to very late fall; New Hampshire, August, September; Maine; New York; New Jersey; Pennsylvania; Maryland; Washington, D. C.; Indiana (Say); Illinois; Lake Superior; British America;

9. *DIPLAX MADIDA* Hagen.

Diplax madida Hagen Syn. Neur. N. A. 1861, 174, 2—Proc. Bost. soc. nat. hist. 1875, v. 18, 80, 11.

Rusty brown, subvillous; front and mouth parts, paler, reddish, vertex, inflated, reddish, tip truncated a little notched; occiput pale brown, villous behind; antennae black; eyes behind yellowish, with three dark brown transversal bands; prothorax darker above; the hind border with two paler large rounded lobes, densely ciliated on the border; thorax dark rusty brown

with brown hairs, lateral sutures near the wings blackish; thorax of the female sometimes of a paler shade on the sides above and before the legs; legs black, trochanters red; anterior femora of the female pale on the basal half below; abdomen reddish, of the female sometimes paler, with the base of the 1st and 2nd segments, the dorsal suture about the 8th and 9th segments, and a lateral stripe in some segments blackish; most of the females with the abdomen reddish without any marks; appendages of the male as long as the penultimate segment, reddish, cylindrical, straight, the pointed tips subdivergent; viewed laterally truncated obliquely at the tip, below with a series of about seven small black teeth in a line before the apex, which is bent upwards, notched with two apical small teeth above; the genital hamulus dark yellowish, forming an elongated plate, concave internally, rounded at the tip; interiorly before the tip, a small but strong black bent hook, penis dark, with two long curved apical setae; anterior plate deeply split, black, bilobate; genital lobe short, narrow, contracted before the rounded tip; appendages of the female shorter than the penultimate segment, pale reddish, cylindrical, pointed; between them a large reddish conical lobe; vulvar lamina yellowish, short, with an angular excision, forming two triangular lobes with a somewhat blunt tip, concave inside.

Wings fumose, the anterior margin and the base more in the hind wings extending beyond the base, flavescent;

veins brown; pterostigma long, narrow reddish; in the females more yellowish, at least below; membranule white; antecubitals 8 (6-9); postcubitals 8 (6-9); 3 discoidal areolets. Length 38-41 mm.; alar exp. 58-64 mm.; pterostigma 3 mm.

HABITAT: Montana 8 August. Three Buttes near head of Milk River; Upper Missouri, Yellowstone (Konopicky); Gulf of Georgia, California, (A. Agassiz); Victoria, Vancouver Island, July (Crotch, H. Edwards); California (H. Edwards.)

This species was described in my Synopsis from the rudiment of a female preserved for a long time in alcohol; thus the paler colors are explained. I have seen 15 specimens male and female.

10. DIPLAX FLAVICOSTA Hagen.

Diplax flavicosta Hagen, Proc. Bost. soc. nat. hist. 1875, v. 18, 81, 13.

A pair caught in copula at San Diego, California by Mr. Crotch induced me to separate them as species. The size and external appearance is similar to *D. madida*. The wings are hyaline, with the anterior margin to the median and a small space at the base of the hind wings flavescent. The male is similar to *D. madida* but the superior appendages have about a dozen small teeth on a line beneath the apical half. The female has on each side of the thorax an oblique pale band, better defined and broader near the legs; on each side along the abdomen a black band is indicated and is more developed at the apex of the segments; the dorsal median

edge is blackish on the 8th and 9th segments, the vulvar lamina with the lobes more pointed on the tip, and better separated at the base.

If *D. flavicosta*, as I believe, is merely a variety of *D. madida*, four smaller females from Victoria, Vancouver Island, July, can not be separated. The smallest is 31 mm. in length; alar expanse 50 mm.; pterostig-

ma 2 mm. The wings are fumose, the anterior margin flavescent in one, another has the base to the nodus or only beyond the triangle flavescent; the anterior pale band on the sides of the thorax is plainly visible; a large black band on each side of the abdomen is complete; in one female the black extends from the end of the segments to the middle ridge.

SYNONYMY OF THE HOMOPTERA DESCRIBED BY SAY, HARRIS AND FITCH.

BY E. P. VAN DUZEE, BUFFALO, N. Y.

In the *homoptera* as in other branches of our favorite science a solid foundation was laid by that illustrious pioneer of American entomology, Thomas Say, whose brief but concise descriptions of many of our native insects have elicited universal commendation from later students. Scarcely inferior to that of Say is the work done many years later by Asa Fitch most of whose numerous species may be readily recognized from his short, clear diagnoses. Intermediate in point of time comes the work of Thaddeus William Harris to whom, however, we owe the description of but very few homopterous insects. In the present paper I propose to give the corrected nomenclature of the *homoptera cicadinae* described by these honored leaders of American entomology so far as it is known to myself or has been made known by recent writers.

Many of these names have been in common use for years, but a number are to be found only in rare or little known papers, and not a few are now for the first time systematically placed. In a few cases where I still feel in doubt the reference is followed by a question point.

Of the 71 species described by Say 60 are known to me; all of those described by Harris, 6 in number, and all but 15 of the 74 species described by Fitch. Two of those described by Say, viz., *Jassus sanctus* and *Membracis subulata*, are, so far as I can learn, unknown to our later entomologists. In the *cicadidae* and *typhlocybidae* I have quoted all references from the studies of Messrs. Uhler and Woodworth whose valuable synonymical notes on these families may be found in Ent. Amer. v. 4, 21 and 81, and PSYCHE,



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