NEW SPECIES OF NORTH AMERICAN EPHEMEROPTERA II*

BY J. MICHENER

Ottawa, Ont.

Leptophlebia striata n. sp.

Male. Very similar in all respects to <i>guttata</i> Mc.D. but noticeably larger in size. Thorax deep blackish, tinged with brown in the pleural sutures. Abdomen with segments 2-6 and anterior portion of 7 whitish, hyaline, with considerable brownish shading on 2. In place of the lateral black dots of <i>guttata</i> there is a short black transverse streak in the posterior-lateral corner of segments 2-6 with some slight brown suffusion anterior to it, especially on segment 2. Rear segments deep chocolate-brown. Setae and forcepts whitish, faintly tinted with brown at base. Legs whitish; tarsal femora tinged with brown throughout, mid- and hind femora only apically with the knee decidedly brown. Wings hyaline with pale venation. The genitalicia are very close to those of <i>guttata</i> (Can. Ent. 1931, LVI, 91, pl. 1, fig. 8) but the penes are convergent, not divergent, at their apices, the basis-like lateral projections are somewhat shorter and the ribbons-like stimuli are longer.

Female. Head red-brown, with black shading on vertex. Thorax and abdomen deep red-brown. Legs pale amber. Wings hyaline with the longitudinal veins faintly amber-colored. The subguttural plate has a deep, narrow U-shaped excision. Length of body 7 mm.; of forewing 7 mm.

*Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.
Holotype—♀, Dundas, Ont., May 31, (G. S. Walley); No. 3382 in the Canadian National Collection, Ottawa.

Allotype—♂, same data. Paraallotype—♂, same data (two bred from nymph); J. E. Jordan, Ont., June 21, 1900, (G. S. Walley).

The flight of this species apparently occurs about two weeks earlier in the spring than that of *guttata*. At Dundas in 1931 no specimens of the latter species were seen, whilst at Jordan, in 1926, when *guttata* was very plentiful, only three specimens of *striezia*, representing probably stragglers, were secured.

Mr. Walley was successful in bringing several nymphs through to maturity and has prepared the following notes on this stage:

"Nymph. Size, general form and color.—Length of body, male 6.5 mm., female 7.5 mm.; caudal setae, male 00 mm., female 10.0 mm. A larger, stouter nymph than *L. guttata* McD. with the head slightly narrower in proportion to the rest of the body and the abdomen broader and not tapering so distinctly posteriorly as does *guttata*. In nature the mature nymphs are a bright coffee brown except for the black wing veins and pale appendages. The brown color is preserved but duller in the alcohol specimens described below.

Head and Mouth parts.—Brownish, with traces of darker shading on vertex. Antennae and mouth parts creamy yellowish. The ocelli indicated by creamy dots surrounded by a dark brownish ring which is sub-integumental.

The maxillary resemble those of *guttata*. Both species have the palpi considerably elongate but in *striezia* the segments, particularly the second, are distinctly shorter than in *guttata*. The terminal palpi have the apical segment slightly more elongate than in *guttata* but in both species this segment is unusually short as compared with the *L. mollis* type figured by Ide (Can. Ent., 1930, LXXI, 2°, pl. 17, fig. 49).

Thorax.—Prothorax fuscous brown with slightly paler lateral margins. Mesothorax brownish, sometimes with an elongate triangular median dash and one or two lateral blotches of paler brown and is mature specimens often with indications of darker brown sub-integumental dashes. Legs entirely pale.

Abdomen.—Sternite brown with lateral margins paler, anterior 5 or 6, tergites with a faint olivaceous pale dash on either side at base, posterior tergites with a very obscure interrupted median streak. Ventro-lateral angles of gill bearing segments with a blackish streak along the margin. In *guttata* nymphs this streak is rilled by a small black process and in both species the character is preserved in the adult. Ventral raker brown with faintly darker patches on either side especially on apical sternites. Gills as in *guttata*. Caudal setae pale brown.

*Pseudoecleon parvulum* n. sp.

Male. Turbinate eyes (dried) deep reddish, decidedly more oval than in *dubium* where they are almost circular. Thorax black-brown. Abdomen with the first six segments dull hyaline whitish with a slight smoky or pale amber suffusion (not the pure white of *dubium*); traces of a line, geminate, reddish mid-dorsal line and a series of five rather large diffuse, lateral, reddish or claret-colored patches, one on each of segments IV-VI, that of IV being less distinct than the others (at times obsolete); tracheae along lateral edge marked
in black. Last four segments dorsally light chocolate-brown, ventrally opaque
whitish with a brownish tinge, deepest on lateral portion of segment IX; forelegs
pale with the basal joint suffused with light sepia-brown and the terminal joint
short and smoky, scarcely longer than broad and quite distinct from the sixth
longer joint of dahlia; setae whitish. Fore femora smoky with slight amber
tinge, tibiae and tarsi smoky white. Mid and hind femora pale, very faintly
amber-tinted with a reddish dash on below edge anteriorly and a distinct, reddish,
臽al spot near apex and well beyond middle of joint; tibiae and tarsi whitish.
Wings hyaline with slight black-brown tinge at extreme base; venation pale;
isthmic fasciae crosswise few in number, with no intervening granulations.

Female. Front and head and base of antennae rather a bright brown;
vertex of head behind ocelli light yellowish, suffused over the median area with
light brown of a rather ochraceous tinge, leaving the yellowish color adjacent to
the eyes. Throax light brown. Abdomen dorsally light brown with a yellowish
tinge, deeper in color laterally, due probably to darker patches corresponding to
the reddish patches in the male: ventrally pale yellowish. Legs pale yellowish,
fore femora largely suffused with bright brown; mid and hind femora with the
reddish areola and spot of the male sex. Wings hyaline with pale venation.
Length of body 3.5 mm. of forewings 3.5 mm.

Holotype—♂, Tullnabor, Ont., June 4, 1926, (G. S. Walley): No. 33)1
in the Canadian National Collection, Ottawa.

Paratypes—♀, same data, June 3.

Localities—23 5, 26 9, same data, June 4.

The species is one of the smallest known; the larger spring generation
is about the size of the second, summer one, of dahlia, and the summer generation,
of which a single male was secured at Karaburna. Que. by Mr. W. J. Brown,
is extremely minute.

It appears to be widespread and quite variable in regard to the red spot-
ting of the abdomen. While my entire Tullnabor series shows these red
blotches very clearly I have a series before me from Niagara Falls, Ont., taken
in late July, some of which are well-marked whereas others have lost all
trace of the red abdominal spots. Most of these immaculate specimens still
show the red ventral dash on either the mid or hind femora; as there is further
no difference in the male genitalia I consider them to be merely poorly-marked
specimens of peruviana. The same remarks apply to a series before me from
Mill River, Alta. (July, August) only a few specimens showing any traces of
red spotting; the majority being a dirty whitish in respect to the color of
the first 6 abdominal segments and only definitely separable from specimens of
dahlia from the same region by the more ovate turbinate eyes and the male
genitalia. Nymphs from the Mill River correspond with eastern nymphs
mentioned in the following paragraph. The larger rubriscutentra McD., from
the same locality has much more extended reddish abdominal suffusion than
even typical peruviana and is at once distinguished by the medio-ventral dark
dots.

Although a definite association was not made, what I believe to be the
synonym of this species was found by Messrs. Brown and Walley at Tullnabor
in early June 1921, at a time when specimens of peruviana were emerging from
the stream; similar nature nymphs were taken at Kamloops, Que. by Mr. Brown in August, 1931, at the spot where the small specimens, mentioned above, was captured, no other mature nymphs being found in, either locality at the time.

The nymph is a very slender, delicate creature and is at once distinguished from others of the genus by the fact that the setae are alternately banded with pale and dark color as in Ecdysoma nymphs. The abdomen is brown with a mediodorsal row of pale spots, one on the anterior margin of each segment; in well-marked specimens there are two lateral anterior dots each side of the median dots and further a pale latero-posterior dot. In the females these spots are often obscure, but in the males, as is usual in the genre, they tend to expand and coalesce so that segments 4, 8 and 9 are largely pale, with a median quadrate dark patch on 4 and subdorsal dark streaks on 8 and 9. In the legs the femora show moderately long hair on the dorsal edge; they are largely dark, with pale patches, the tibiae and tarsi with the apical section brown. The gills are large, oval, pale, with a distinctive dark subapical patch and a median black trache which usually gives off a single short branch at base.

The nymphs of planctonemus McDb. and virile McDb. are now also known, single female specimens having been bred by Mr. Walley and myself at Miner's Bay, near Mississ, Ont. in May, 1931 and the nymphal skin secured. Of planctonemus a mature male nymph was also taken, the subventral spots showing up subcutaneously (these spots do not persist in the nymphal skin). No further virile nymphs were found at Miner's Bay, but a few from the Moira river at Belleville, Ont. seem to match the nymphal skin before me. The following key, largely based on male nymphs, will augment that given in this journal recently (1931, Vol. LXIII, p 85). The number of species in this genus is apparently not yet exhausted as there are several unassociated series of nymphs before me from various eastern localities which do not match any species given in the key.

KEY TO KNOWN NYPHEAE OF PSEUDOCENTRINUS SPECIES

1. Two caudal setae alternately banded with light and dark...fasciatus McDb.
2. Two caudal setae otherwise
3. Caudal setae with median dark band
   Caudal setae banded

5. Abdominal segments, especially in 8, with strong color variation; segments 3, 4, 8-10 being largely pale, others dark; 9 with a dark lateral dash...
   Abdominal segments largely dark; no lateral dash in 9

4. Rear abdominal segments with traces of pale dorsal band; usual dark subdorsal and subventral dots distinct; anterior segments with pale subdorsal dots; medioventral dark dots of adult present...planctonemus McDb.
   Rear abdominal segments with dorsal pale band; dark dots obscure; pair of subdorsal pale spots on anterior portion of each segment; no medio-ventral dark dots...virile McDb

5. Short, chunky species with broad thorax; long hairs on dorsal margin of femora and tibiae; first eight abdominal segments almost entirely dark
carolina Briksi.
More elongate species; hairs on femora considerably shorter; abdomen paler
with segments 4 and 8-10, particularly in 8, frequently pale
.....
.....cinquefortum McD.
In conclusion it might be noted that nymphs of Heteracrona carolina
MeO. fall into the section with unhandled caudal setae, but may be distinguished
by the fact that the gills are largely blackish with a narrow pale border.

Genus Batisca Walsh

In working over the species of this genus in our collections in connection
with Miss Traver’s recent paper (1931, Jour. N. Y. Ent. Soc., XXXIX, 43) I
find two undescribed species, both of which have been definitely associated
with the nymphal stages. I am further able to record the occurrence of what
I believe to be carolina Traver at Knowlton, Que.; nymphs were taken by Mr.
W. J. Brown in Knowlton Creek, about 3 miles south-east of town in 1928 and
a male and female secured at the same place on June 14 and 16. Miss Traver,
who has examined specimens of the nymphs, states that they differ from those
of carolina in having less sharp lateral spines and in lacking the large black
spots on the abdomen behind the gills; such differences, however, I can hardly
regard as specific in view of similar variation in other material before me and
as the adults agree very nicely with the characterization I am holding them for
the present under this name. We also have a single immature nymph from
Kamloops, Que., taken in August, 1931, by Mr. Brown, which corresponds
to the diagnosis of callioza Traver. It is evident that the nymphs on which the
description of callioza was based were very immature and in all probability
rather than our Kamloops one would have reached maturity and emerged
until the spring of the following year; consequently it is impossible to say
whether the lack of spine on the mesonotal shield (which is characteristic of
callioza nymph as described) is found in mature nymphs or whether possibly
spines may develop during the later nymphal stages; the matter must await
future study.

As very excellent characters for specific separation are found in the
nymphs I offer the following key to those species of which the early stages
are known; this includes the two undescribed species above mentioned but
omits rubescens Prov., the early stages of which are still to be discovered.

KEY TO KNOWN SPECIES OF BATISCA NYPHMS
1. Mesonotal shield with neither dorsal or lateral pairs of spines.

2. Both dorsal and lateral pairs on mesonotal shield

3. Only lateral spines on mesonotal shield

4. Head with a pair of prominent frontal projections

5. Head with prominent frontal processes

6. Head with frontal processes reduced to very small, blunt tubercles

7. The head with the development of the large, upturned spines; the
frontal tubercles are very long and slender, those of the abdomen
very long and slender.

8. The head with the development of the large, upturned spines; the
frontal tubercles are very short and stout.

9. The head with the development of the large, upturned spines; the
frontal tubercles are very short and stout.
Baetisca laevispina n. sp.

Male. Entire insect dorsally deep brown with the lateral, somewhat flange-like, edge of the mesonotum paler; thoracic sternum deep brown; abdominal sternites paler brown with the tergita dark dirty amber-colored; setae pale brownish, ringed intersegmentally with darker. Wings hyaline, the longitudinal veins brown, the crossvein pale, scarcely visible except in the anal area. legs dull amber, the prothoracic pair rather deeper in color than the two hinder pairs.

Female. Very similar to male in coloration but with the head and prothorax slightly paler brown than the remainder of the body. The wing venation is also paler. Length of abdomen 9 mm.; of forewing 10 mm.

Subimago. Color much as in adults. Wings varying from almost black with fine hyaline reticulation to a pale-banded form in which the median and terminal areas show bands and streaks of pale color.

Holotype—♂, Lachine, Que., June 6, 1930, (G. S. Valley) (reared from nymphs); No. 3987 in the Canadian National Collection, Ottawa.

Allotype—♀, same data, June 7.

Paratypes—♂ 2, same locality and collector, June 6, 8.

A number of specimens from Ottawa, Ont., and a single male from Fredericton, N. B., probably also belong here but without nymphs from these localities I refrain from including them in the type series.

In the adults the species is separable from B. Say (as represented in our collection by one of Walsh's specimens) by the dark longitudinal venation. The nymphs should be readily recognized by the characters given in the key and in the accompanying illustration.

(*Abaetisca lacustris*) n. sp.

Male. Dorsally brown, ringed with redder brown on the apical abdominal segments. Thoracic sternites pale brown; abdominal sternites, forecoxae and legs pale yellowish-white. Setae whitish, unlanded. Wings hyaline with entirely pale venation.
Female. Somewhat paler than the male but in general with similar coloration. Length of body 7 mm.; of forewings 8 mm.

Subimago. Body coloration as in adult. Wings much less heavily reticulate than in preceding species, the dark color more or less confined to the median area of primaries where it forms a transverse band and to the apical section of both primaries and secondaries. At times the dark color is much reduced so that the subimago appears almost unmarked.

Habitat—\( d \), Peter Island, Ont., July 3, 1931, (O. S. Walley); No. 338 in the Canadian National Collection, Ottawa.

Allotype—\( 2 \), Leamington, Ont., June 24, 1931 (W. J. Brown).

Paratypes—\( 15, 2, \) Peter Island, July 3, 1931, (Walley and Brown); \( 2 \), Fisher Glen, Ont., June 12, 1931, (W. J. Brown); \( 2 \), Pt. Pelee, Ont., June 19, 24, 1935, (G. S. Walley); \( 1 \), Pt. Pelee, Ont., June 29, 1931, (W. J. Brown).

Numerous cast nymphal skins of this species were found along the shore of Lake Erie in the vicinity of Normandale, Ont. and a mature nymph found in a pool in the same region was bred to a subimago which corresponded to the subimagos found on Peter Island and in the Pt. Pelee region. Similar nymphal skins were also found at Southampton on Lake Huron and an examination of Clemens' material from the Georgian Bay shows that it was this species he recorded (1913, Can. Ent. 33:1) under the name abna Say. It is evident that we are dealing with a species indigenous to the Great Lakes. A small series of adults from Tweedsmuir and Awerse, Man., also appears to belong here but I have no knowledge of the nymphs.

The striking difference between the dark upper and the pale underside of the adult abdomen together with the entirely hyaline wings should identify the species readily. The male genitalia are very similar throughout the genus and offer no characters which can be used satisfactorily to separate species.