PRIVATE LIBRARY
OF WILLIAM L. PETERS

Excerpt from Canadian Entomologist February 1923

NEW CANADIAN EPHEMERIDAE WITH NOTES*

BY J. MCDUNNOUGH,
Ottawa, Ont.

CAENINI.

Tricorythus atrata sp. nov.

Male. Head and thorax black, the latter shiny; abdomen dull blackish with traces of white intersegmental rings, somewhat paler ventrally. Fore legs blackish, paling towards the extremities, the tarsi being white-tinged; mid and hind legs with blackish femora and white tibiæ and tarsi; setæ white. Wings semi-hyaline with the usual dark mark along the costa. Length of body 2—3 mm.; of wing 4½ mm.

Holotype—♂, Wakefield, Que., Aug. 6, (J. McDunnough); No. 546, in the Canadian National Collection, Ottawa.

Allotype—♀, same data, in the Canadian National Collection, Ottawa.

Paratypes—16 ♂, 1 ♀, same data.

The species was common early in the day flying over the La Peche River, a small tributary of the Gatineau, about 20 miles north of Ottawa. Its dark color distinguishes it from *allecta* Needh., from which it also differs in genitalic characters, the apical portion of the penes being drawn to a long point, leaving the basal half broad and roughly diamond-shaped.

BAETINI.

Since my notes on the species of this interesting group found in the Ottawa region (Can. Ent. 1921, LIII, 117) I have continued my studies of them with particular attention to the living material. All three species mentioned in the above paper, *propinquus* Walsh, *intercalaris* McD. and *flavistriga* McD. occurred very plentifully in the neighborhood of the Rideau River during the summer of 1922; there are apparently two generations of each species, as I captured specimens in early June and again from the middle of August until early in September, the second generation being rather smaller in size than the spring one. In the living state the differences in the size of the turbinate portion of the eyes of the males is very noticeable and this, combined with differences in the color of the thorax and posterior segments of the abdomen makes a separation of the males fairly easy; the females, concerning whose identity I was uncertain in my former article, have now also been distinguished; I offer the following descriptions, drawn up from live material, to supplement the previous ones:—

Baetis intercalaris McD.

Male. Turbinate portion of eye large, lengthily oval, deep brown with upper part of stalk yellow; sessile portion of eye black. Face black with inner edge of ocelli, and a spot at the base of the eye, pale yellow-green. Antennæ black, paler at tip with basal joint ringed with yellow at apex. Thorax shiny blackish with lateral edge of mesonotum and posterior protuberances tinged with dull olivaceous; lateral sutures shaded with brown. Abdomen with segments 2—6 hyaline white, 7—10 dorsally umber brown, ventrally opaque white; in the spiracular area the tracheæ are lightly marked with black; setæ white. Legs dirty white, claws black.

*—Contribution from Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

Female. Can be distinguished in nature from the females of the other two species by its deep olive brown color and the dark venation of the wings which often have a purplish sheen.

Baetis propinquus Walsh.

Male. Turbinate eyes moderately large, oval, deep brown with upper half of stalk yellow; sessile portion blackish. Face black with light green shading only at base of antennæ; antennæ black with white ring at apex of first joint. Thorax black, shiny, the only traces of pale markings being in the lateral sutures. Abdomen hyaline whitish with segments 7—10 light sepia brown dorsally and opaque white ventrally. Spiracles black. Legs and setæ white, fore femur slightly smoky.

Female. Head olivaceous yellow, slightly marked with red-brown. Thorax dull olive brown marked slightly with yellowish laterally below wings. Abdomen pale yellowish with series of large subdorsal brown spots on segments 2—7, these spots tending to coalesce and form stripes; segments 8—10 unicolorous yellowish, spiracular area slightly marked with black. Legs white, setæ white. In contradistinction to the preceding and following species the veins of the primaries are pale.

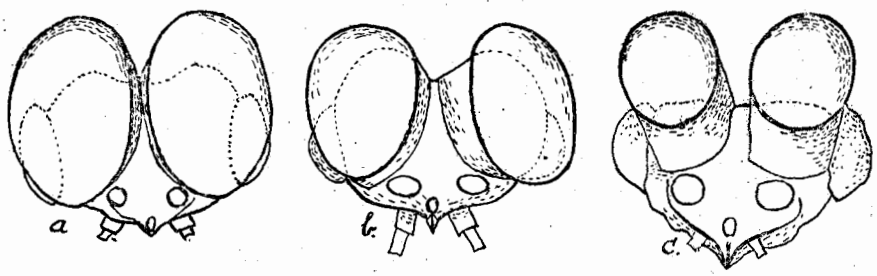

Fig. 1. Relative size of turbinate eyes of *a. Baetis intercalaris* McD.; *b. Baetis propinquus* Walsh; *c. Baetis flavistriga* McD.

Baetis flavistriga McD.

Male. Turbinate eye on a long stalk; small, oval, light brown with a yellowish tinge (much lighter than in *propinquus* and *intercalaris*); stalk purple brown with upper third yellow. Face black with pale green markings around base of antennæ and ocelli; antennae blackish. Thorax dark olivaceous (paler than in *intercalaris*) with yellowish shades on the pronotum and an oblique streak along the lateral edge running forward from base of wing; considerable pale yellow markings on the lateral sutures. Abdomen hyaline tinged with pale yellow-brown on segments 2—6, the posterior segments being light umber brown, the contrast between the two colors not being so marked as in the two preceding species; ventrally paler with last segments opaque creamy; spiracular area slightly marked with black. Legs with all the femora pale yellow; other portions dirty whitish.

Female. Head yellow, tinged considerably with dirty olive-brown. Antennæ with basal joint yellow, second joint brown. Thorax and abdomen pale (occasionally dark) olive-brown; prothorax edged with yellow, mesothorax with yellow streak as in male and with posterior protuberances often tinged with yellow; laterally there is considerable yellow shading, noticeably a patch in front of the wings. Abdomen with narrow yellow intersegmental rings; ventrally

paler with last two segments shaded with creamy. Setæ white, smoky at base. Legs smoky with femora tinged with olivaceous.

Besides *Baetis unicolor* Hagen, which in the ♂ sex has the abdomen entirely brown, as in the ♀, several other undescribed species have been discovered in the course of our collecting. A description of these follows:

Baetis phoebus sp. nov.

Male. Turbinate eyes (in living specimen) large, long-stalked, broadly oval, almost circular, upper surface red-brown with a narrow yellow rim. Head and thorax (dried specimen) brown, latter with a yellow streak extending from base of primaries to anterior prominence of mesonotum along lateral edges of same; rear portion of meso- and anterior portion of the metathorax variably shaded with light ochreous; lateral sutures more or less marked with ochreous. Abdomen with segments 1—6 whitish hyaline with very faint olivaceous tinge (less than in *flavistriga*); segments 7—10 bright brown, slightly ruddy dorsally, opaque whitish ventrally, variably tinged with brown; spiracular flange slightly dotted with blackish. Legs very pale yellowish. Wings hyaline with pale cross-nervures; intercalaries well-developed; pair between subcosta and radius no longer than those following; hind wings broad, well developed.

Female. Pale olive or yellowish, ventral portion of abdomen lighter in color than dorsum. Primaries with cross-nervules light brown. Length of body 5 mm.; of fore-wing 5½ mm.

Holotype—♂, Ottawa West, May 25th, 1921 (A. W. Richardson); No. 527 in the Canadian National Collection, Ottawa.

Allotype—♀, Ottawa West, May 27, 1921 (J. McDunnough); in the Canadian National Collection, Ottawa.

Paratypes—9 ♂, 3 ♀, taken by the above collectors in the same locality on May 25 and 27, in the Canadian National Collection.

The species is closely allied to *flavistriga* McD., but is considerably larger; the turbinate eyes are noticeably larger and the pale portion of the abdomen contrasts more with the brown posterior portion, due to the practical lack of olive shading such as is found in *flavistriga*. The specimens were all taken along a small creek just west of the city limits and the females are presumed to belong to this species. Unfortunately building operations have spoiled the collecting ground. Several specimens of what appears to be this species have been taken on our office window at various times, but the series is not large enough for a definite determination.

Baetis dardanus sp. nov.

Male. Very similar to *propinquus* Walsh, but slightly larger and with turbinate portion of eyes also larger. Thorax dark shiny black-brown, as in *propinquus,* with lateral sutures marked in whitish. Abdomen with segments 2—6 hyaline whitish, segments 7—10 brownish-olive (Ridgway Pl. XXX, m) dorsally, opaque white ventrally, shaded with brown; forceps whitish. Along the spiracular line, instead of the black dots of *propinquus* is a faint, ruddy shade. Legs pale yellowish, setæ white. Wings hyaline, the secondaries not angled on costa near base as in *propinquus* but evenly rounded, leaf-shaped.

Female. Light olivaceous, hardly to be distinguished from the same sex

of *propinquus* except by the characteristic shape of secondaries. Length of body 5 mm.; of fore wing 5½ mm.

Holotype—♂, Aweme, Man., June 11, (N. Criddle); No. 528, in the Canadian National Collection, Ottawa.

Allotype—and 2 ♂ *Paratypes,* same data, in the Canadian National Collection, Ottawa. In the National Collection is also a single specimen from Ottawa, Ont. (Aug. 22; J. McDunnough) which agrees with the above in shape of secondaries and general appearance. Without more material, however, it is unwise to place it under this name definitely.

Baetis nanus sp. nov.

Male. Turbinate eyes small, oval, slightly smaller than in *flavistriga* McD., in living specimens pale yellow-brown, in dried ones bright red, marked with yellowish around rim. Thorax pale olivaceous, at times tinged with smoky posteriorly and with brownish shades on anterior sutures. Abdomen with segments 2—6 semihyaline, dorsally yellowish, with at time faint brown tinges, ventrally dull, pale ochreous, lateral area most noticeably hyaline with spiracular line streaked and spotted with black; segments 7—10 more opaque and shaded dorsally with isabella brown (Ridgway Plate XXX, i); setæ whitish. Femora yellow; remainder of legs dull hyaline whitish. Wings hyaline. Length of body 3 mm.; of forewing 4 mm.

Holotype—♂, Ottawa, Ont., Aug. 19, 1922, (J. McDunnough); No. 529, in the Canadian National Collection, Ottawa.

Paratypes—4 ♂, same data, in the Canadian National Collection, Ottawa

The specimens were all captured on bushes near the banks of the Rideau River; while the species is close to *flavistriga* it may be readily separated by the color of the eyes in the live ♂, the paler thorax and yellower dorsal area of abdominal segments 2—6. I have not yet succeeded in differentiating the ♀, but have two ♂ specimens taken May 18, 1921, which may represent the spring generation; they are slightly larger and darker colored than the types.

Centroptilum fragile sp. nov.

Male. (living). Eyes with turbinate portion large, narrowly oval, almost kidney-shaped, pale yellow-brown; basal half of stalk purplish with yellow band; sessile portion dull greenish. Face yellowish above and between the ocelli; antennæ light smoky with white base. In dried specimens the turbinate eyes shrivel to bright red lunate disks between which the front appears as a dark gray oval with a V-shaped incision at apex.

Thorax shiny black-brown with pale markings on posterior protuberances; lateral area browner with pale markings at base of wings. Abdomen whitish hyaline slightly streaked with black, especially in stigmatal area; dorsally segments 7—10 rather bright brown, ventrally opaque white; anterior segments slightly tinged with brown and with faint brown intersegmental rings. Legs white. Wings hyaline with single intercalaries.

Female. Head pale yellowish with slight brown striation; ocelli ringed with brown. Thorax light olivaceous with creamy markings on posterior edge of prothorax and lateral edges of mesothorax anterior to the wings; dorsal protuberance white; white edging to metanotum. Abdomen pale yellow-green with

black tracheæ and slight whitish intersegmental rings; ventrally still paler. Length of body 4 mm.; of fore wing 5 mm.

Holotype— ♂, Rideau River, Ottawa, Ont., Aug. 22, 1922 (J. McDunnough); No. 530, in the Canadian National Collection, Ottawa.

Allotype— ♀, same data, in the Canadian National Collection.

Paratypes—3 ♂, same locality and collector, Aug. 16, 1922, in the Canadian National Collection, Ottawa.

A smaller species than *luteolum* Mull., which Eaton records from the Hudson Bay region and with which description two females from Nordegg, Alta., seem to agree; the male forceps lack entirely the conical basal protuberance of *luteolum* said to be characteristic of the species, they resemble closely Eaton's figure (Pl. XVII, fig. 30b) of *C. pennulatum* Eaton.

Centroptilum curiosum sp. nov.

Male. (living). Turbinate portion of eyes large, lengthily oval, deep brown with upper half of stalk pale yellow; sessile portion black. Head black. Thorax shiny black shaded laterally below the wings with brown. Abdomen with segments 1—5 hyaline, shaded slightly dorsally with pale greenish yellow and with a small, round red-brown spot on segments 2 and 3, rarely on 4 and 5; segments 6—10 dorsally light sepia brown, this shading at times extending forward as far as segment 3; ventrally shaded with opaque white; spiracular area often marked with black. Forceps white; setæ white, ringed on basal segments with red-brown. Legs whitish, fore-femora blackish, fore tarsus quite short and only equal to about three-fourths the length of tibiae. Wings hyaline; primaries with two intercalaries, fairly well developed except between Sc. and R and between the anal veins; hind wing present but reduced to a mere thread, much narrower than is typical for *Centroptilum.*

Female. Paler than the male; thorax olive brown; abdomen dirty olive green with segments 2—5 slightly tinged dorsally with yellowish and with brown dots on 2 and 3; segments 6—10 shaded with brown. Length of body 4½—5 mm.; of fore-wing 5—5½ mm.

Holotype— ♂, Ottawa, Ont., Aug. 22 (J. McDunnough) No. 531, in the Canadian National Collection, Ottawa.

Allotype— ♀, same data, in the Canadian National Collection, Ottawa.

Paratypes—14 ♂, 6 ♀, same locality and collector, Aug. 21, 22, 23, in the Canadian National Collection, Ottawa.

The shortness of the fore-legs, the paired intercalaries of the primaries, and the almost entire reduction of the secondaries may call for a new generic name, but for the present I place the species in *Centroptilum.*

The genus *Cloeon* falls into two sections, according to whether the intercalary veins of the primaries are single or paired; the first section is the typical one, contains *vicina* Hag. and *mendax* Wlsh., and seems closely allied to *Centroptilum.* The second section has more affinity to *Baetis* and is represented by *dubia* Wlsh. Several new species occur in Canada which are described as follows:

Section I.

Cloeon rubropicta sp. nov.

Male (dried). Head blackish brown, turbinate eyes long, narrowly oval, shrivelling so as to form lunate lateral disks, leaving the central portion of the

head free, as mentioned under *Centroptilum fragile*; antennae with pale basal joints. Thorax deep brown, slightly ruddy along sutures and edges of meso- and metanotum. Abdomen with segments 2—6 pale yellowish white, segment 2 dorsally with a ruddy inverted "Y" mark, segments 3—6 with slight traces of a ruddy median line and with small subdorsal red dots placed near the segmental incisures; laterally the stigmatal flange is marked by a broken black line and above this are faint red dots, one in the centre of each segment; dorsally segments 7—10 bright red-brown with setæ and forceps whitish; ventrally the posterior segments are opaque whitish; legs entirely pale yellowish white. Wings hyaline with single intercalary veinlets.

Female. Head yellowish; thorax light ochreous to olive brown, shaded below the wings with deeper brown. Abdomen dorsally much the same color as thorax, paling on posterior segments, except 10, which is ruddy; the subdorsal red dots extend along the entire abdomen; black spiracular line as in ♂; ventrally thorax and abdomen entirely pale yellowish; legs yellowish. Length of body, ♂, 3 mm., ♀, 4 mm.; of wing, ♂ 4 mm.; ♀, 5½ mm.

Holotype—♂, Ottawa, Ont., Aug. 19, 1922, (J. McDunnough); No. 532, in the Canadian National Collection, Ottawa.

Allotype—♀, Ottawa, Ont., June 14, 1920 (J. McDunnough), in the Canadian National Collection, Ottawa.

Paratypes—12 ♀, Ottawa, Ont. (June 9, 11, 14, 1920; Aug. 16, 19, 22, 1922) (J. McDunnough); 2 ♂, 1 ♀, Norway Pt., Lake of Bays, Ont. (July 14, 1920; July 1, 1922) (J. McDunnough).

Cloeon ingens sp. nov.

Male. Head smoky, tinged with ruddy; basal joints of antennæ dusky; eyes shrivelled as in preceding species, discolored. Thorax shiny blackish with the sutures tinged with ruddy brown; laterally below the rings heavily shaded with pale brownish. Abdomen with segments 2—6 dorsally dull olive brown, semi-hyaline with the segmental incisures faintly ringed in black and with black markings along spiracular flange; segments 7—10 deep chocolate brown; ventrally dirty whitish with posterior segments opaque and slightly shaded with brown, setæ and forceps whitish, the former tinged with ruddy at base. Legs smoky brown. Wings hyaline with single intercalaries.

Female. Thorax and abdomen above olive-brown shaded with ruddy, especially posterior three segments of abdomen, which are almost entirely ruddy and show traces of maculation in the shape of curved, pale subdorsal lines on anterior portion of each segment. Venter and legs pale ochreous. Length of body 8 mm.; of wing 9 mm.

Holotype—♂, Nordegg, Alta., Aug. 3, 1921, (J. McDunnough); No. 533, in the Canadian National Collection, Ottawa.

Allotype—♀, Banff, Alta., Aug. 4, 1922, (C. B. Garrett), in the Canadian National Collection, Ottawa.

The two sexes may not be correctly associated, but similarity of size and general habitat leads me to place them together. It is the largest species as yet reported from North America.

Section II.

The commonest *Cloeon* species found along the Rideau River at Ottawa

is one to which I am applying the name *dubia* Walsh. As stated by the author, it bears a marked similarity to *Baetis propinquus* Wlsh., but lacks hind-wings and is smaller; the males of our Ottawa specimens do not possess the black lateral spiracular dots mentioned by Walsh, but often show a faint, dark spiracular line; the turbinate eyes are considerably smaller than in *propinquus* and almost circular, in living specimens the upper surface is ruddy brown; the thorax is shiny black and the abdomen hyaline with segments 7—10 dorsally pale umber brown, rather paler than in *propinquus*. The species is double-brooded, occurring in May and June and again in August and September.

Two other closely allied species have been taken sparingly along with *dubia*; the one is distinguished by its larger turbinate eyes and by the presence of a row of minute dots centro-ventrally on the abdomen, the second, which has only been captured in August, differs markedly in the living state by the color of the turbinate eyes, which are yellow-green. I propose the following names for these:

Cloeon punctiventris sp. nov.

Male (living). Turbinate eyes almost circular, larger than in *dubia* Wlsh., light yellow-brown, stalk paler and ringed with purple-brown just above base. Face blackish, base of ocelli and antennæ tinged with pale yellowish green; antennæ black, paling towards tip, first joint with pale apical ring. Thorax blackish with light olive shading laterally and slight greenish markings on anterior portion and lateral edge of mesothorax and on the dorsal protuberances. Abdomen hyaline whitish with segments 7—10 light brown (rather ruddier than in *dubia*) dorsally and opaque white ventrally; faint black spiracular dots on the pale segments and a centro-ventral row of minute dots placed on the posterior margin of each segment. Setæ white. Legs whitish, fore femora generally tinged with smoky. Wings hyaline with paired intercalaries.

Female (dried). The single female which I incline to associate with the above ♂ has the head, thorax and dorsal surface of abdomen light olivaceous brown; the ventral abdominal region is whitish with the centro-ventral row of brown dots much larger than in the ♂. Length of body 3—4 mm.; of wing 4—4½ mm.

Holotype—♂, Rideau River, Ottawa, Ont., Aug. 19, (J. McDunnough); No. 557 in the Canadian National Collection, Ottawa.

Allotype—♀, Ottawa, Ont., June 4, (J. McDunnough), in the Canadian National Collection, Ottawa.

Paratypes—5 ♂'s, same locality and collector, June 3, Aug. 19, 22, in the Canadian National Collection.

There is also a vial containing ten ♂'s of this species in alcohol, collected on May 20, 1921, which may be considered as Paratypes. As is usual in this group, the spring specimens are somewhat larger than the fall ones.

Cloeon chlorops, sp. nov.

Male (living). Turbinate eyes similar in size to those of *dubia*; yellow-green with a purple-brown band at base of stalk (in dried specimens the eye appears deep purplish with a broad outer edging of pale red-brown). Head shiny black, ringed with greenish around antennæ and ocelli; thorax blackish, shiny, with pale lateral sutures and slight greenish shades on anterior portion of mesothorax; abdomen hyaline with faint yellowish tinge, segments 7—10 pale

brown (rather ruddier than in preceding species) the color extending more or less over ventral surface; a faint brown spiracular line. Setæ white. Legs whitish with smoky fore femora. Wings hyaline with paired intercalaries. Length of body 3 mm.; of wing 4 mm.

Holotype— ♂, Ottawa, Ont., Aug. 16, (J. McDunnough); No. 558 in the Canadian National Collection, Ottawa.

Paratypes—8 ♂'s, same data, in the Canadian National Collection, Ottawa.

Cloeon virilis sp. nov.

Male. Head blackish; eyes (dried) large, oval, deep red-brown; antennae blackish. Thorax shiny black with the anterior lateral edge of the mesonotum to base of wing with pale yellow streak; lateral and ventral sutures slightly pale-marked. Abdomen with segments 2—6 hyaline, dorsally with faint tinge of ruddy on segmental incisures and two minute, red subdorsal dots on anterior part of each segment; laterally the tracheæ of the stigmatal area are strongly outlined in black, segments 7—10 dorsally chocolate brown; ventrally entire abdomen pale with faint, medio-ventral ruddy dots on segments 5 and 6 and considerable ruddy shading on 7 and 8; forceps and setæ pale. Fore-leg with femur and base of tibia smoky yellow, remainder pale whitish; other legs whitish with apex of femur and a median band pale purplish-red. Wings hyaline with paired intercalaries. Length of body 4 mm.; of wing 5½ mm.

Holotype— ♂, Ottawa, Ont., June 7, 1922, (J McDunnough); No. 534, in the Canadian National Collection, Ottawa.

A larger and chunkier species than any so far taken at Ottawa.

SIPHLONURINI.

The key as given by Needham (Bull. 86, N. Y. Sta. Mus., 25, 1905) for the separation of the *Siphlonurus* group of genera is not entirely satisfactory and is capable of misinterpretation by one unfamiliar with the species of this group. His first main subdivision is as follows:

g. Median caudal seta a distinctly segmented rudiment; forceps of male three-jointed; posterior prolongation of sternum of ninth segment of abdomen of female bifid at tip.

gg. Median caudal seta more rudimentary or wanting; forceps of the male distinctly four-jointed; posterior prolongation of the sternum of the ninth abdominal segment in the female entire at tip.

Under the first heading he places *Coloburus* and *Chirotenetes* (*sic*); under the second *Siphlurus* (*sic*) and *Ameletus.*

The segmentation or non-segmentation of the aborted median caudal seta is a poor character on which to separate two main groups, especially when dried material is being examined. I have found specimens of *Siphlonurus triangularis* Clem. which show a distinct segmentation of this seta and other specimens, which undoubtedly fall into Needham's *Chirotenetes,* possess an almost entirely aborted seta, with no trace of segmentation. The characterization of the male forceps as three and four-jointed is misleading; in *Siphlonurus triangularis* Clem., for instance, only three joints can be distinguished, the basal one being doubtless fused with the ventral plate, whilst in some species of *Chirotonetes* the splitting of this plate into two lobes certainly gives the appearance of a basal fourth joint.

Finally, while the bifid nature of the ninth abdominal plate in the female is very pronounced in *Chirotonetes*, it is also very slightly noticeable in the type species of *Ameletus* (*subnotatus* Eaton), and the character must be used with caution. As a basis for primary separation I find it more satisfactory to use a character found in the tarsal claws; the dissimilarity of these claws in each tarsus separates *Ameletus* (and incidentally *Coloburus*, which is not a North American genus) from *Siphlonurus* and *Chirotonetes*. To separate the two latter genera the position of the fork of the median vein of the hind-wing can be used very advantageously; this character has the advantage of being readily seen and of being present in both sexes. In this connection it may be stated that *Chirotonetes* Eaton (misspelt *Chirotenetes* by Needham and others) will fall to *Isonychia* Eaton; this latter generic name was proposed in 1871 (Trans. Ent. Soc. Lond., 134) for *manca* Eaton and *ignota* Wlk.; in 1881 (Ent. Mon. Mag. XVIII, 21) Eaton proposed the name *Chirotonetes* to replace *Isonychia*, under the impression that it was preoccupied by *Isonychus* Mannh., and used this term in his monograph (1885, Mon. Rec. Eph. 203) with type specified as *ignotus* Wlk. As, however, under the international Rules of Nomenclature, *Isonychia* Eaton is perfectly valid, it must again be used, with *Chirotonetes* as synonym, and *generic* type, *ignota* Wlk.

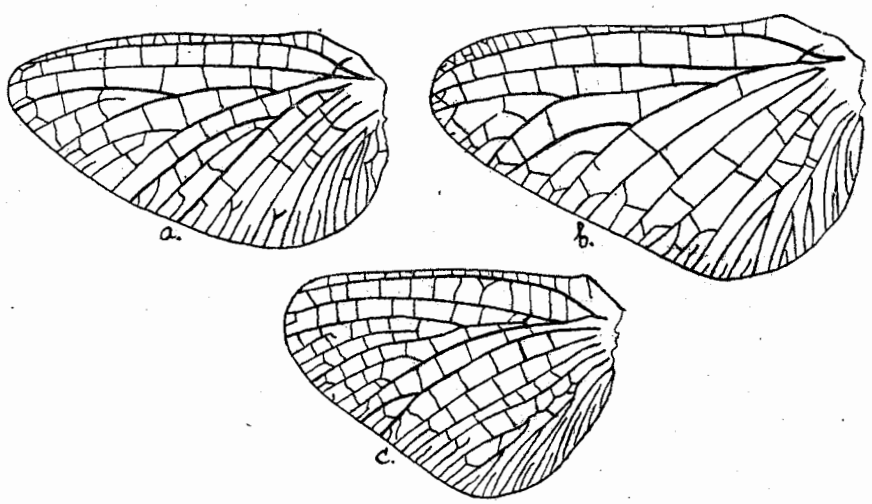

Fig. 2. Hindwings of *a. Siphlonurus triangularis* Clem.; *b. Siphlonuroides croesus* McD.; *c Isonychia mancus* Eaton.

The median vein of the hind-wing, mentioned above, is forked for fully half its length in *Siphlonurus*, whereas in *Isonychia* it is quite short and the fork occurs in the outer fourth of the vein; in still another group, which seems of generic value, there is no fork at all, and for such species I propose the term *Siphlonuroides*. *Siphlonisca* Needh., which has not yet been reported from Canada, may be separated by the broad expansions of the abdominal segments and *Siphloplecton* Clem. (1915, Can. Ent. XLVII, 258) obviously falls into the Heptageninæ, as it shows the two pairs of intercalaries between the first and second anal veins; in fact the type species, *flexus* Clem., is a synonym of *basalis* Wlk. treated by Eaton under *Heptagenia* (Mon. Eph. p. 298).

For separation of our Canadian genera in this group the following key is offered:—

1. Claws of each tarsus dissimilar ..... *Ameletus.*
   Claws of each tarsus similar ..... 2.
2. Median vein of secondaries unforked ..... *Siphlonuroides.*
   Median vein of secondaries forked ..... 3.
3. Fork of median vein of hind-wings long, occurring at about half its length; posterior prolongation of sternum of ninth abdominal segment in female entire at tip ..... *Siphlonurus.*
   Fork of median vein of hind-wings short, occurring at about three-fourths of its length; posterior prolongation of sternum of ninth abdominal segment in female bifid at tip ..... *Isonychia.*

Siphlonuroides gen. nov.

Similar in general characters to *Siphlonurus* Eaton, but distinguished by the lack of a fork to the median vein of hind wings. Type of genus; *S. croesus* sp. nov.

Siphlonuroides croesus sp. nov.

Male. Head pale yellowish, marked with black at base of ocelli and along the central ridge. Thorax dull brown, the mesothorax shaded with yellowish anteriorly, most prominently along the median suture; a broad black line from base of primaries to lateral edge of prothorax, bordered on each side by yellowish; posterior portion of meso- and metathorax shaded with pale orange with the central tubercle blackish. Abdomen dorsally dull brown with lateral triangular pale patches on anterior portion of each segment; these pale triangles are improminent on the first seven segments, and are semi-transparent; on the three last segments they are brighter yellow and more opaque, especially prominent on the tenth segment; traces of subdorsal dark streaks, especially on posterior segments; ventrally the abdomen is yellowish with a large brown quadrangular patch on each segment which leaves the ground color only visible along the anterior margin and as a lateral triangular patch; ninth segment entirely brown except a small, yellow anterior triangle. Forceps and basal plate brown, the latter deeply notched on posterior margin. Setæ black-brown with slightly deeper colored rings marking the segmentation. Fore-legs deep brown, femur paler along upper margin and at apex; mid and hind legs dull olive-brown with darker tarsi. Wings hyaline with dark veins, primaries clouded with pale umber brown over the inner two-thirds of the wing, except for the costal half of the wing at the extreme base, which remains colorless; secondaries with an umber-brown shade along the costa.

Female. Head yellow, bordered anteriorly by a dark band and with subdorsal dark brown bands from rear of each lateral ocellus to posterior margin of head. Maculation of body similar to that of the male, with the subdorsal dark streaks better defined. Wings without any umber brown shade. Length of body 12—13 mm.; of fore-wing 13 mm.

Holotype— ♂, Ottawa, Ont., May 22, 1922, (J. McDunnough); No. 522, in the Canadian National Collection, Ottawa.

Allotype— ♀, same data, in the Canadian National Collection, Ottawa.

Paratypes—1 ♂, 2 ♀, same locality and collector, May 22; 2 ♀, May 29, in the Canadian National Collection, Ottawa.

Siphlonuroides midas sp. nov.

Male. Head blackish; thorax olive brown, shaded with paler yellowish olive anteriorly in median line, and on the posterior tubercle of the mesothorax. Abdomen dorsally brown with the segmentations distinctly marked in blackish, ventrally duller and paler brown with only the faintest trace of maculation, in the shape of small lateral darkish spots on each segment; setæ brown with darker intersegmental rings. Legs olive brown, the fore legs deeper in color than the others. Wings hyaline with dark veins, a faint trace of brown shading on primaries between subcosta and vein R_1 at basal half of wing, a brown dot at base above inner margin and a very faint shade along costa before apex of wing.

Female. Head yellowish with broad, dark brown median band; abdomen ventrally with segments marked narrowly in pale ochreous; wings hyaline with faint brownish tinge along costa for entire length. Otherwise as in male. Length of body ♂, 10 mm., ♀ 8 mm.; of fore-wing 10 mm.

Holotype—♂, Ottawa, Ont., May 29, (J. McDunnough); No. 523, in the Canadian National Collection, Ottawa.

Allotype—♀, same data, in the Canadian National Collection, Ottawa.

Siphlonurus berenice sp. nov.

Male. Head brownish, paler on the face; thorax dull brown with pale, clay-colored shading in medio-dorsal area. Abdomen brown dorsally with the usual pale triangular patches laterally, the last three segments more opaque and paler; ventrally pale brown, semi-transparent, except on last three segments, which are opaque and shaded with ochreous; forceps dull smoky in apical portion. Legs pale olive brown; fore-legs with the tarsal joints very long, subequal and tibia only slightly longer than first tarsal joint. Wings hyaline with dark veins, very slightly tinged with pale brown along apical portion of costa. Length of body 10 mm.; of fore-wing 10 mm.

Holotype—♂, Cascades, Gatineau River, Quebec, June 13, (J. McDunnough); No. 524, in the Canadian National Collection, Ottawa.

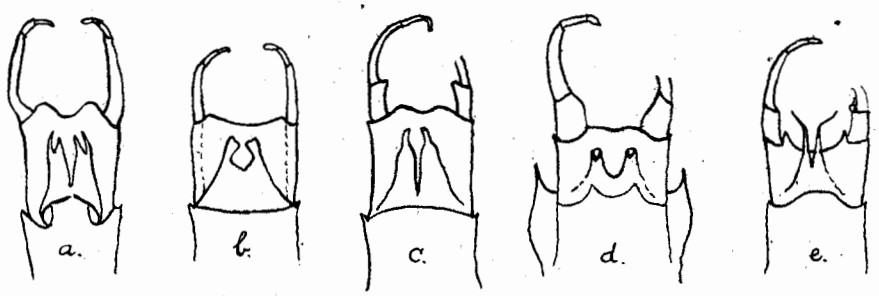

Fig. 3. Male genitalia of *a. Siphlonuroides croesus* McD.; *b. Siphlonuroides midas* McD.; *c. Siphlonurus berenice* McD.; *d. Siphlonurus phyllis* McD.; *e. Ameletus validus* McD.

Siphlonurus phyllis sp. nov.

Male. Head and thorax black brown, the latter shaded somewhat with yellowish anteriorly. Abdomen dark brown dorsally with the usual subdorsal dark streaks and a bifid patch of yellow laterally on the anterior margin of each segment, becoming more extended on posterior segments; ventrally yellowish, very characteristically marked with a brown median stripe flanked by a large brown dot on anterior portion of segment and a smaller dot in central portion

of segment, which generally touches the median stripe; some slight brown shading along spiracular flange, ninth segment largely pale yellow with a deep brown lateral streak and diffuse brown shading in median area, especially at base of segment, lateral edge produced to a prominent sharp tooth; ventral plate squarely truncate; forceps pale ochreous. Setæ whitish. Legs dull olive brown, femora banded with brown. Wings hyaline with dark veins and with very faint tinges of pale brown in basal area.

Female. Very similar in maculation to the male. Ventral prolongation of ninth abdominal segment small and evenly rounded; with the exception of segments eight and nine, the ventral area is considerably clouded with brown, but the maculation remains distinct. Length of body, ♂, 12 mm.; ♀, 13 mm.; of fore-wing ♂, 12 mm.; ♀, 14 mm.

Holotype—♂, Banff, Alta., July 26, (C. B. Garrett); No. 525, in the Canadian National Collection, Ottawa.

Allotype—♀, Banff, Alta., July 25, (C. B. Garrett); in the Canadian National Collection, Ottawa.

Ameletus validus sp. nov.

Male. Head discolored; thorax deep black-brown, shiny, tinged with light brown on anterior sutures of mesothorax and in the area adjacent to the posterior tubercles. Abdomen pinkish brown, the first six segments semi-transparent with narrowly opaque sutures; segments 7—10 opaque, segment 9 being shaded laterally with smoky brown; abdominal plate brown, with paler lateral edges and a light ochreous median area, posterior margin strongly excavated medianly with a small tooth on either side of the concavity; forceps smoky brown. Prolegs deep black brown, other legs similar in color to abdomen. Wings hyaline with dark veins, faintly clouded with light umber brown, palest along outer margin. Length of body 10 mm.; of fore-wing 11 mm.

Female. With more extended pale thoracic shading and no cloud on wings.

Holotype—♂, Banff, Alta., Oct. 1 (C. B. Garrett); No. 526, in the Canadian National Collection, Ottawa.

Allotype—♀, Banff, Alta., Sept. 20 (C. B. Garrett); in the Canadian National Collection, Ottawa.

Paratype—1 ♂, Banff, Alta., Sept. 30 (C. B. Garrett); in the Canadian National Collection, Ottawa.