

pointed, hind margin flattened and slightly concave before tip, basal half of costal area rather narrow; hyaline, with pale brown markings, those in apical portion of wing more or less coalescent and forming on each gradate series an oblique streak; pterostigma indistinct, pale; an indistinct pale line bisects the costal space longitudinally through the bases of intercostal forks; veins pale, with numerous brown interruptions, those on radius and cubitus most pronounced; each brown spot on the longitudinal veins between radius and hind margin gives off an oblique pale brown mark each side, thus forming several series of V-shaped markings, the angle of the V's pointing inward; gradate veins almost wholly brown; hind margin of wing brown, interrupted with pale spots; posterior fork of median vein strongly bent toward the cubitus, thus making the inner veinlet connecting it with the cubitus much shorter than the outer; radio-median cross vein situated at least as far before the forking of the median as the former is long and joining radius much before origin of first sector; three radial sectors, anterior branch of the third forked before the inner gradate series and before the subpterostigmal radial cross vein, posterior branch simple; five gradate veins in inner series, the last beyond the next to the last, seven or eight in outer series (seven in left wing, eight in right wing, in the type specimen). Posterior wings hyaline, unmarked; the veins pale, tinged with reddish brown, some of the gradate veins darker; the first fork of radial sector plainly before forking of median.

Fieldbrook, Humboldt county, California, 30 May, one specimen.

Type.—No. 7902, U. S. National Museum.

This species, also, is allied to *H. pacificus*, and falls in the same group and section of the genus. It differs from *pacificus* in its larger size, paler color, broader, more pointed, differently shaped and differently marked wings, etc.

Micromus variolosus Hagen.

Bright Angel, Colorado Canyon, Arizona, altitude 2,300 feet, 10 May, five specimens.

This is a widely distributed species in Arizona and has been recorded from Williams, Hot Springs (in Yavapai county), Prescott, Flagstaff, Winslow and the Santa Rita and Chiricahua Mountains. It is common, also, in other parts of the west.

HEMEROBIIDÆ FROM THE KOOTENAY DISTRICT OF BRITISH COLUMBIA.

By ROLLA P. CURRIE.

The Hemerobiid lace-winged flies collected in British Columbia last summer by Dr. H. G. Dyar, Mr. A. N. Caudell and myself comprised twelve species, represented by eighty-six

specimens. Of the various species obtained, *Polystæchotes punctatus*, *Hemerobius pacificus*, *H. disjunctus* and *Micromus montanus* appear to be the commonest species, with *Hemerobius mæstus*, perhaps, coming next in abundance. The finding of *Hemerobius castaneæ* and *Sisyra vicaria* is of interest. It is rather unfortunate that each of the five new species described in this paper is represented by a single specimen only; yet the characters they exhibit appear to differentiate them well from the species previously recognized.

I am indebted to Mr. Nathan Banks for the loan of his collection to aid in determining our material, and for helpful suggestions.

The four genera represented in the collection may be distinguished by the key given in Needham's "Aquatic Insects in the Adirondacks."*

Sisyra vicaria (Walker).

Hemerobius vicarius Walker, Brit. Mus. Cat., Neur., p. 297, 1853.

S[isyra] vicaria Hagen, Syn. Neur. N. Am., p. 197, 1861.

"Lilypad Lake," Kaslo, 8 July. Two specimens of this interesting little Hemerobiid, whose larvæ are known to live parasitically on fresh water sponges, were secured on the borders of a small marshy pond in the forest. This is the first record of the capture of *Sisyra* in Western North America. It seems possible that the related genus *Climacia*, the larvæ of which, as discovered by Needham, have similar habits, may also some day be found in the West.

These specimens appear to differ somewhat from examples in the National Museum labeled *vicaria*, yet do not in all respects agree with Needham's description of *umbrata*,† the only other described North American species. It does not yet appear certain that Needham's and Walker's species are distinct, and a good series of *vicaria* from Georgia, the type locality, may be necessary to definitely settle the question. These things considered, I prefer not to describe the two specimens from British Columbia, perhaps more or less teneral, as representing a new species.

Polystæchotes punctatus (Fabricius).

[*Semblis*] *punctata* Fabricius, Ent. Syst., II, p. 73, 1793.

P[olystoechotes] punctatus Hagen, Syn. Neur. N. Am., p. 206, 1861.

Kaslo, 12 July to 20 August, 28 specimens; Robson, 20 August (Dyar: three specimens); Arrow Lake, 21 August (Dyar: three specimens).

* Bull. N. Y. State Mus., No. 47, p. 551, September, 1901. What Needham, under *aa* in his key, terms *branches* of the radial sector are commonly known simply as radial sectors.

† Bull. N. Y. State Museum, No. 47, p. 555, pl. 12, figs. 6 and 7, text figs. 33, 34 and 36, September, 1901.

two specimens) ; Sandon (G. C. Robbins : nine specimens). Dr. Dyar secured, also, two specimens at Victoria on August 24, and three more at Shawnigan Lake (Vancouver Island) on September 1.

A very abundant species during the latter part of the summer and commonly attracted to the electric lights. All our specimens were taken in houses, either flying around the lights, in the evening, or, in the daytime, resting on the walls, having flown in the night before. They exhibit great variation in size, the length to tip of folded wings ranging from 21 mm. to 34 mm.

Genus *HEMEROBIUS* Linnæus.

The species of the genus *Hemerobius* in the collection all belong to the group having three radial sectors. The following key may be of assistance in distinguishing them :

KEY TO THE SPECIES OF *HEMEROBIUS* OF THE KOOTENAY DISTRICT, B. C.

- a* Posterior fork of median vein bent toward cubitus, thus making the inner veinlet connecting it with cubitus shorter than the outer; radio-median cross vein situated at or before forking of median, and joining radius at or before origin of first sector; in hind wings first fork of radial sector plainly before forking of median.
- b* Radio-median cross vein situated at least as far before forking of median as the former is long, and joining radius much before origin of first sector; forking of median plainly before origin of first sector.
- c* Pterostigma reddish *mæstus*
- cc* Pterostigma not reddish.
- d* A longitudinal, median, dorsal, pale yellowish stripe on thorax, or the latter mostly pale yellowish; anterior branch of third radial sector forked before inner gradate series, and, normally, before *subpterostigmal radial cross vein*.*
- e* Wings plainly marked with fuscous on gradate series, apex and hind margin..... *castaneæ*
- ee* Wings but faintly marked with fuscous on gradate series, apex and hind margin.
- f* Wings rather broad, obtusely pointed at tip; pterostigma small and indistinct; spots along radius and cubitus small; larger species..... *pacificus*

*I apply this term to the inner of the two veins connecting the radius and its outermost sector and lying more or less in line with the inner gradate series. The anterior branch of third sector is forked at the subpterostigmal radial cross vein in left fore wing of *H. dyari*, type, but this is undoubtedly abnormal.

- ff* Wings narrow, rather narrowly rounded at tip; pterostigma large and distinct; spots along radius and cubitus large; smaller species.....*dyari*
- dd* No dorsal pale stripe on thorax, which is wholly dark except for a small spot in center of mesonotum; anterior branch of third radial sector forked as far out as, or beyond, inner gradate series and beyond subpterostigmal radial cross vein.*kokaneanus*
- bb* Radio-median cross vein situated at, or but slightly before, forking of median, and joining radius at, or but slightly before, origin of first sector; forking of median not before, but almost directly beneath, origin of first sector.
- c* Alar expanse more than 12 mm.; body dark; wings plainly marked with fuscous.
- d* Anterior branch of third radial sector forked as far out as, or beyond, inner gradate series and subpterostigmal radial cross vein; last gradate vein of inner series beyond the next to the last.....*caudelli*
- dd* Anterior branch of third radial sector forked before inner gradate series and subpterostigmal radial cross vein; last gradate vein of inner series before the next to the last.*glacialis*
- cc* Alar expanse less than 12 mm.; body pale; wings very faintly marked with pale brownish.....*kootenayensis*
- aa* Posterior fork of median not bent toward cubitus, the inner veinlet connecting it with cubitus not shorter than the outer; radio-median cross vein situated beyond forking of median and connecting anterior fork of the latter with first radial sector; in hind wings first fork of radial sector beneath, or beyond, forking of median.....*disjunctus*

Hemerobius mæstus Banks.

Hemerobius mæstus Banks, Trans. Am. Ent. Soc., xxiv, p. 25, February, 1897.

Kaslo, 16 June to 8 July, three specimens.

The specimen collected on June 16 seems to be in the general condition, the wing markings being indistinct. The wings in this specimen are somewhat broader than in the two others.

Hemerobius castaneæ Fitch.

H[emerobius] castaneæ Fitch, First Rep. Insects N. Y., p. 94, 1856.

H[emerobius] castaneæ Hagen, Syn. Neur. N. Am., p. 202, 1861.

Kaslo, 2 and 24 July, two specimens.

In view of the fact that *H. pacificus* has been considered as possibly a western form of this species, it is somewhat of a surprise to find in our collection examples of what appear to be typical *castaneæ*. The ten specimens of *pacificus* collected in British Columbia show no gradation toward *castaneæ* and indications are that these two forms are distinct species.

Hemerobius pacificus Banks.

Hemerobius pacificus Banks, Trans. Am. Ent. Soc., xxiv, p. 24, February, 1897.

Kaslo, 29 May to 5 August, ten specimens.

Hemerobius dyari, n. sp.

Alar expanse 13 mm. Body above and below, including legs and antennæ, pale yellowish, the latter darker toward tip. Face indistinctly bordered with darker and with an indistinct line around antennal sockets, piceous below each eye and on lateral margins and middle of clypeus; apical joint of palpi piceous. Pronotum dark each side, leaving a longitudinal median pale stripe. Anterior wings rather narrow—their width scarcely more than one-third their length—their tips rather narrowly rounded; basal half of costal area rather narrow; costa flattened—almost concave—in the middle, strongly convex above the large pale pterostigma; smoky hyaline, with pale spots along the longitudinal veins; veins pale, with indistinct brownish spots—most pronounced along the radial sectors from inner to outer gradate series; hind margin of wing, from middle to apex, brownish, interrupted with pale spots and with a brownish spot near base; radius spotted with dark brown from near base to pterostigma; cubitus, also, spotted with dark brown, some of the spots larger than those on the radius, the largest one covering the basal veinlet connecting with the posterior fork of the median, and another large one midway between this and the apical connecting veinlet; a large, paler brown spot on the median above the apical connecting veinlet; posterior fork of median bent toward cubitus, thus making the inner veinlet connecting it with cubitus shorter than the outer; radio-median cross vein situated at least as far before forking of median as the former is long and joining radius much before origin of first sector; forking of median plainly before origin of first sector; three radial sectors, anterior branch of the third forked before inner gradate series (and before subpterostigmal radial cross vein in right wing of type specimen, at this vein in left wing), posterior branch simple; five gradate veins in inner series, the last (hindmost) slightly beyond the next to the last, seven in outer series.* Posterior wings hyaline, unmarked, the veins wholly pale; first fork of radial sector plainly before forking of median.

Kaslo, 17 July, one specimen.

Type.—No. 7896, U. S. National Museum.

This species fails in Banks' Group II, Section A, † and is allied

*In the outer gradate series I include the outer of the two transverse veins connecting the radius and the third sector; the inner of these two transverse veins, however, is *not* included in the inner gradate series and is alluded to as the *subpterostigmal radial cross vein*.

† Trans. Am. Ent. Soc., xxiv, p. 24, February, 1897.

to *H. pacificus*. It differs from the latter in being of smaller size, and in having narrower and differently shaped wings, larger and more distinct pterostigma and larger spots along radius and cubitus.

Hemerobius kokaneeanus, n. sp.

Alar expanse 14 mm. Body above and below obscure fuscous or piceous; the basal half of antennæ, posterior lateral angles of pronotum, a small spot in center of mesonotum, and the legs mostly, pale. Anterior wings rather narrow—their width less than two-fifths of their length—their tips narrowly rounded, hind margin flattened apically, the basal half of costal area very narrow; hyaline, tinged with smoky and marked with fuscous; veins pale, with scattered brown spots—principally where crossed by the wing markings; these wing markings comprise an irregular, more or less interrupted band on each gradate series, a large spot on subpterostigmal radial cross vein, some spots at fork of median and along cubitus, hind margin (with the exception of a few pale interruptions), and series of smaller spots on the longitudinal veins between radius and hind margin; pterostigma indistinct; a pale longitudinal line bisects costal space through the bases of intercostal forks; posterior fork of median strongly bent toward cubitus, making the inner veinlet connecting with cubitus much shorter than the outer; radio-median cross vein situated at least as far before the forking of median as the former is long, and joining radius much before origin of first sector; forking of median plainly before origin of first sector; three radial sectors, anterior branch of the third forked as far out as, or beyond, inner gradate series (as far out as inner series in left wing, and beyond inner series in right wing, in the type specimen) and beyond subpterostigmal radial cross vein, posterior branch simple; five gradate veins in inner series, the last before the next to the last, six or seven in outer series (six in right wing, seven in left, in the type specimen). Posterior wings hyaline, with a faint smoky tinge, most of the veins dark, the longitudinals pale at base; first fork of radial sector plainly before forking of median.

Kokanee Mountain, altitude 9,000 feet, 10 August, collected upon snow on glacier; one specimen.

Type.—No. 7897, U. S. National Museum.

The venation of this species seems to place it with *H. pacificus*, *H. castaneæ* and *H. dyari*, except that in these latter three the anterior branch of the third radial sector is forked before the inner gradate series and subpterostigmal radial cross vein, while in *H. kokaneeanus* it is forked as far out as, or beyond, inner gradate series and beyond the subpterostigmal radial cross vein. The wholly dark thorax and the darker and more closely approximated wing markings, however, readily distinguish it from any of the species just mentioned.

Hemerobius caudelli, n. sp.

Alar expanse 13.2 mm. Body above and below obscure fuscous or piceous; the basal half, or more, of antennæ, the vertex, hind portion of pronotum medially and its posterior lateral angles, meso- and metanotum medially, and the legs, pale. Anterior wings rather broad—their width two-fifths of their length—their tips and hind margin rounded, basal half of costal area rather broad; hyaline, marked with dark and pale fuscous; veins pale, with fuscous interruptions—principally where crossed by the wing markings; these wing markings consist of an irregular, more or less interrupted band on each gradate series, numerous shorter, irregular, transverse spots or bands between them and before them to near base of the wing, numerous short, nearly confluent, transverse spots at apex and hind margin, and series of transverse pale fuscous spots in costal and anal areas; a pale longitudinal line bisects costal space through bases of intercostal forks; pterostigma indistinct, creamy whitish; posterior fork of median somewhat bent toward cubitus, making the inner veinlet connecting with cubitus a little shorter than the outer (no inner connecting veinlet in left wing of type); radio-median cross vein situated a little before forking of median and joining radius at, or a little before, origin of first sector (a little before first sector in right wing, *at* first sector in left wing, in the type specimen); forking of median almost directly beneath origin of first sector; three radial sectors, anterior branch of the third forked as far out as, or beyond, inner gradate series and subpterostigmal radial cross vein (*at* these in left wing, beyond these in right wing, in the type specimen), posterior branch simple; four or five gradate veins in inner series (four in right wing, five in left, in the type), the last beyond the next to the last, five or six in outer series (five in right wing, six in left, in the type). Posterior wings hyaline, faintly tinged with smoky on gradate veins and elsewhere; veins mostly dark, the longitudinals pale at base; first fork of radial sector plainly before forking of median.

London Hill Mine, Bear Lake, altitude 7,000 feet, 29 July, collected upon snow; one specimen.

Type.—No. 7898, U. S. National Museum.

This species bears some resemblance to *H. kokaneeanus*, but differs from it in the position of the radio-median cross vein and in the relative position of the forking of the median vein and origin of first radial sector; it differs, also, in that the vertex and the meso- and metanotum are largely pale, the wings broader and more rounded and their markings larger and more extended, while the last veinlet of inner gradate series is beyond the next to the last. It belongs in Banks' Group II, Section A, as do all the other species of *Hemerobius* in the collection, with the exception of *H. disjunctus*.

Hemerobius glacialis, n. sp.

Alar expanse 15.5 mm. Body above and below obscure fuscous or piceous; basal half of antennæ, vertex, a posterior central spot and posterior lateral angles of pronotum, a broad longitudinal median band on meso- and metanotum, and the legs principally, pale. Anterior wings rather broad—their width two-fifths of their length—their tips? (torn off), basal half of costal area rather broad; hyaline, tinged with smoky and marked with fuscous; veins pale, with scattered brown spots—principally where crossed by the wing markings; these wing markings consist of an irregular, more or less interrupted band on each gradate series, numerous short, irregular spots (sometimes tending to form bands) along the longitudinal veins, some larger spots at forking of median and along cubitus, a large spot on subpterostigmal radial cross vein, and some transverse spots in costal area, these spots pale in basal portion; apex and hind margin of wing tinged with smoky; pterostigma indistinct; a longitudinal pale line bisects costal area at bases of intercostal forks; posterior fork of median bent toward cubitus, making the inner veinlet connecting with cubitus shorter than the outer; radio-median cross vein situated at the base of fork of median and joining radius at origin of first sector; forking of median almost directly beneath origin of first sector; three sectors, anterior branch of the third forked before inner gradate series and subpterostigmal radial cross vein, posterior branch simple; five gradate veins in inner series, the last before the next to the last, six in outer series. Posterior wings hyaline, with a faint smoky tinge, most of the veins dark except at base; first fork of radial sector plainly before forking of median.

Kokanee Mountain, altitude 9,000 feet, 10 August, collected upon snow on glacier; one specimen.

Type.—No. 7899, U. S. National Museum.

This Hemerobiid bears some resemblance to *H. kokanceanus* and *H. caudelli*. It seems to be more closely related to the latter, however, since it substantially agrees with that species in the position of the radio-median cross vein and the relative position of the forking of median vein and origin of first radial sector; like that species, also, it is pale on the vertex and on the meso- and metanotum. It differs from *H. caudelli* in that the last gradate vein of inner series is before the next to the last, while the anterior branch of third radial sector is forked before the inner gradate series and subpterostigmal radial cross vein; the wing markings, also, are smaller and less extended.

Hemerobius kootenayensis, n. sp.

Alar expanse 11 mm. Body above and below, including legs and antennæ, pale yellowish, the latter somewhat darker apically; a stripe below each eye and the apical joints of palpi piceous; sides of face tinged with red-

dish. Anterior wings rather broad—their width slightly more than two-fifths of their length—their tips narrowly rounded, almost pointed, hind margin rounded, basal half of costal space broad; hyaline, faintly tinged with pale brownish, especially on veins on inner gradate series, at base and apex of cubital cell, and along hind margin basally; veins pale yellowish; posterior fork of median bent toward cubitus, making the inner veinlet connecting it with cubitus a little shorter than the outer; radio-median cross vein situated at, or but slightly before, forking of median (*at* forking of median in left wing, slightly before it in right wing, in type specimen), and joining radius at origin of first sector; forking of median almost directly beneath origin of first sector; three sectors (four in right wing in type specimen, but the fourth forked only once before inner gradate series and subpterostigmal radial cross vein), anterior branch of third (in left wing of this specimen) forked before inner gradate series and subpterostigmal radial cross vein, posterior branch simple; five gradate veins on inner series, the last very slightly before the next to the last, the third from the last and next to the last particularly coinciding, seven in outer series. Posterior wings hyaline, unmarked, the veins pale yellowish; first fork of radial sector plainly before forking of median.

Kalso, 17 June, one specimen.

Type.—No. 7,900, U. S. National Museum.

This diminutive *Hemerobius* is allied, by venation, to *H. caudelli* and *H. glacialis*—particularly to the latter. The faint, pale brownish wing markings suggest that the type may be a freshly emerged specimen and not fully colored. Its size and appearance suggest *H. canadensis* Banks, but the latter is described as having the “cubitus [median] *not* curving toward the postcubitus [cubitus], the connecting veinlets each way about equal, a connecting veinlet from cubitus [median] to radius *before* the origin of the first sector; . . . *four or five* gradate veinlets in outer series,” etc. (The bracketed words and italics are mine.)

Hemerobius disjunctus Banks.

Hemerobius disjunctus Banks, Trans. Am. Ent. Soc., xxiv, p. 25, February, 1897.

Kaslo, 13 June to 20 August, four specimens; Bear Lake, 29 July, one specimen; Kokanee Mountain, altitude 9,000 feet, 10 August, collected upon snow on glacier, two specimens; Revelstoke, 14 August (Currie) and 22 August (Dyar), two specimens.

The specimen collected on June 13 is in the teneral condition.

Micromus montanus Hagen.

Micromus montanus Hagen, Proc. Bost. Soc. Nat. Hist., xxiii, p. 279, September, 1886.

Kaslo, 11 June to 5 August, four specimens; Ainsworth, 11 July, two specimens; Kokanee Mountain, altitude 8,000 feet, 10 August, one specimen.

The specimen collected on June 11 is teneral.

The two following papers were read by title:

NEW DIPTERA FROM CENTRAL AMERICA.

By D. W. COQUILLET.

In the month of August, 1903, Prof. Carl F. Baker, of Pomona College, Claremont, California, donated to the National Museum a duplicate series and the unique specimens of Diptera collected by himself during a trip through Mexico and Central America, the only conditions being that the writer would engage to identify the specimens and publish descriptions of the new forms. The task of identifying and describing having now been completed, the descriptions are offered herewith:

Family CHIRONOMIDÆ.

Ceratopogon terminalis, n. sp.

Black, the legs yellow, the hind tibiæ and their tarsi except their bases brown (antennæ, front tarsi, and middle tibiæ and their tarsi wanting); eyes rather widely separated, head and body polished, mesonotum somewhat scabrous, its hairs whitish; legs slender, devoid of spines, outer side of hind tibiæ and upper side of their tarsi fringed with rather long hairs, first joint of hind tarsi nearly twice as long as the second; wings very long and narrow, bare, whitish hyaline, the broad apex brown, apex of third vein near nine-tenths of the length of the wing, this vein wholly separated from the first vein and from the costa, not connected by a cross-vein; apex of first vein near one-fourth of the length of the third; veins whitish, the third vein, small cross-vein and last section of the costa brown, fourth vein forks slightly before the small cross-vein. Length 3 mm.

A female specimen from San Marcos, Nicaragua.

Type.—No. 7807, U. S. National Museum.

Family MYCETOPHILIDÆ.

Sciara trifasciata, n. sp.

Yellow, the front, upper part of the occiput, a pair of elongate-oblong spots on the mesonotum, the knobs of the halteres and the second, third and fourth segments of the abdomen except the narrow front margins of