Reprinted from BULLETIN OF THE BROOKLYN ENTOMOLOGICAL SOCIETY,
Vols. LIX & LX, pp. 23–29. 1964–65

A NEW SPECIES OF THE SUBGENUS *IRON* FROM MEXICO (EPHEMEROPTERA: HEPTAGENIIDAE

By JAY R. TRAVER[1]

The specimens herein reported were sent to me several years ago by Dr. Lewis Berner of the University of Florida, Gainesville, Fla.

Epeorus (Iron) metlacensis, n. sp

Allied to *Epeorus (I.) hesperus* (Banks), differing from that species by reason of the abdominal markings as well as by the dissimilar fore claws of the male imago. Like *hesperus, metlacensis* belongs in the *albertae* group of this subgenus.

Male imago (holotype). Body 12 mm.; fore wing 13 mm.; fore leg 13 mm. Head light reddish brown; narrow black markings anterior to ocelli and along anterior margin of frontal carina. Pedicel of antenna black in apical half; filament reddish brown. Large eyes, contiguous apically, mostly obscure vertex and occiput of head; however, occiput appears black-margined posteriorly. Thorax reddish brown. Anterior margin of pronotum, a somewhat crescent-shaped mark at middle of posterior margin, and a stripe extending down on to fore coxa, blackish. Narrow black median stripe and narrow lateral line anterior to wing roots, on mesonotum; scutellum smoky brown tinged strongly with reddish. Metanotal scutellum similar in color to that of mesonotum; area directly preceding it brighter reddish brown with narrow dark transverse markings. Black streaks on pleura anterior to wing roots, before and behind leg bases; black markings on coxa and trochanter of mid- and hind legs. Narrow black markings at posterior borders of meso- and metasterna.

Legs pale reddish brown. Deep brown median and pre-apical bands and narrow dark basal pencilings on all femora; median bands tend to form a dark spot. Fore femur approximately ¾ of tibia. Fore tibia black at apex; narrow dark transverse line at "knee" on all tibiae. Tarsal joinings and claws dark reddish brown; fore tarsus shaded with smoky apically. *Claws of fore tarsus dissimilar,* one sharp-pointed, one blunt; first three segments subequal to each other. See Fig. 4. One fore leg of holotype missing. Legs originally mounted in Hoyer's but had to be remounted; in this process segments 3 and 4 of remaining fore leg were lost. Data cited above taken previous to the original mount. Claws and distal segment as well as the two basal segments still present on type slide.

[1] University of Massachusetts, Amherst, Mass.

Wings hyaline. Venation of fore wing light reddish brown, paler in anal area. Costal space before humeral cross vein faintly purplish when first studied, purple tinge no longer noticeable. Cross veins distinct, somewhat heavier than longitudinals; stigmatic area opaque whitish. Humeral cross vein widely black at subcosta-radial end, narrowly so at costal margin, giving the effect of a black comma-shaped mark, its tail on costal margin. Before bulla, eight cross veins (wide space between seventh and eighth); three between bulla and stigmatic area; circa 12 stigmatic veins, most of which are upright or but slightly oblique. At bulla, three somewhat crowded cross veins in subcostal and also in radial space. Veins in hind wing paler, cross veins prominent only in anterior half; faintly darker area at extreme base.

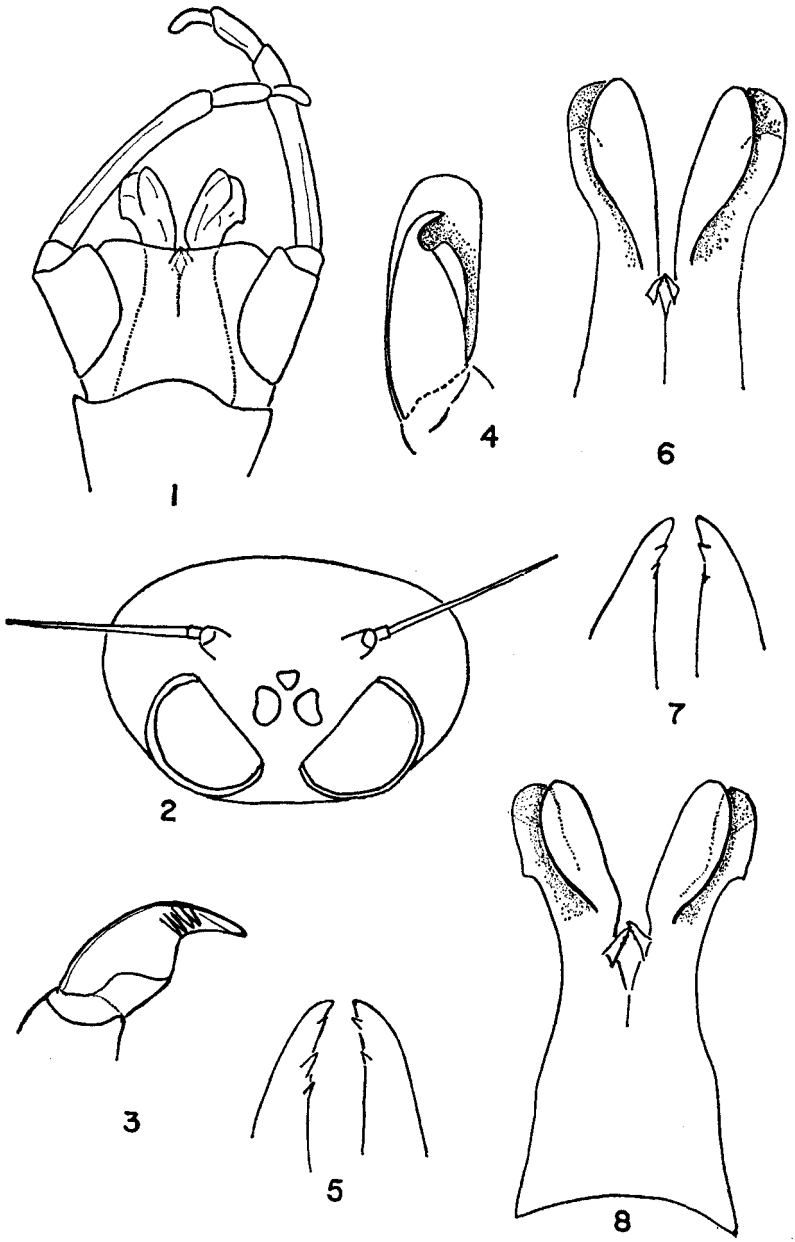
Basal and middle segments of abdomen yellowish translucent, apicals reddish brown, opaque. Continuous black median streak dorsally on tergites one thru eight, wider in anterior half of each tergite where it encloses a very narrow pale median line; on last two tergites, reduced to a very narrow median streak. Posterior margins of tergites one thru seven blackish, this band continuous laterally on two thru seven with an oblique black streak surrounding a pale spot at stigma and extending forward from this spot along pleural fold, as in *hesperus*. In addition, an oblique grayish brown streak on all tergites except the last two, midway between median line and pleural fold. Sternites pale yellowish; dark gray mid-line, faint except over ganglionic areas, widest on sternite one. Tails yellow, very narrowly darker at joinings. Genitalia yellowish with faint reddish tinge; for details of structure, see figs. 1, 7 and 8. Note the small spines (spinules?), on the larger central ones, which seems to be a distinguishing feature separating this species from others of the same group which have been heretofore described.

Male paratype. Similar to holotype, except as indicated. In one fore wing, five and an incomplete sixth cross vein before bulla, in the other fore wing seven in this area; in each wing, 11 stigmatic cross veins. Abdominal markings rather more prominent. Penes as in Figs. 5 and 6. Note apparent absence of any lateral spine-like extensions on these structures.

Explanation of Plate I

All figures are of *Epeorus* (*Iron*) *metlacensis* n. sp. Fig. 1, Genitalia of holotype male. Fig. 2, Head of presumed nymph. Fig. 3, Claw of presumed nymph. Fig. 4, Claw of the fore leg, male imago. Fig. 5, Details of spines on penes, paratype male. Fig. 6, Penes of paratype male. Fig. 7, Details of spines on penes, holotype male. Fig. 8, Penes of holotype male.

TRAVER PLATE I



Female imago (allotype). Body 13 mm.; fore wing 15 mm. Differs from male, in addition to usual sexual dimorphism, as follows. Posterior margin of head, streak from median ocellus to posterior margin, and lateral streaks between eyes and lateral ocelli, dark brown. Thorax somewhat ruddy. Venation of fore wing darker and more conspicuous than in male; stigmatic area faintly pink-tinged. Humeral cross vein not paler toward costal margin. Mid-dorsal line on abdominal tergites more prominent, does not enclose a paler central line. Oblique lateral streaks reddish brown, more extensive, so that entire dorsal portions of tergites three thru six appear suffused with a reddish tinge, leaving paler areas between dark mid-line and inner margin of oblique streak on each side; on three, these pale areas in anterior half of tergite only, somewhat square in shape; on four thru seven, pale areas triangular, base of triangle on anterior margin, apex not attaining posterior margin. Tergite two largely dark gray with reddish tinge, except for narrow pale anterior margin and pale lateral area anterior to dark line which encloses whitish spot at stigma. Dark midventral line wider and more pronounced, not noticeably darker at ganglionic areas; widest on sternite seven, where it forms a butterfly-shaped area around egg valve.

Collection Data: *Holotype*—Male imago. Metlac, Mexico, 25 Dec., 1940; H. Hobbs, Collector. "Clear swift stream at Metlac, State of Orizaba? Origin of stream in snowfield of Mt. Orizaba. Very cold water. Late in P.M., just before dark they (the mayflies) emerged from rapids by the thousands." The above quoted from field notes by Dr. Hobbs. Specimen in private collection of J. R. Traver. *Allotype*—Female imago. Same data as above. In private collection of J. R. Traver. *Paratype*—Male imago. Same data. In collection of Dr. Lewis Berner.

A subimago male is included in this material sent to me by Dr. Berner. Similar to imago, except for smoky red-tinged wings. As in the paratype, the spine-like lateral extensions on the penes, usually found in males of this group, are apparently absent.

Discussion. The *albertae* group of the subgenus *Iron* now includes five species, of which four have been described previously; all are from North America, but only *metlacensis* occurs south of the United States. *Epeorus* (*I.*) *albertae* McDunnough, 1924 and 1929, is known from Alberta, Wyoming and Montana. The type specimen of *E.* (*I.*) *hesperus* (Banks), 1924, a single female, was taken in Washington state. *E.* (*I.*) *sancta-gabriel* Traver, 1935, from California, has recently been synonymized with *hesperus* (Edmunds and Allen, 1957): this possibility was noted in the original description of the species. *E.* (*I.*) *youngi* Traver, 1935,

is considered a synonym of *albertae*. The other two species described heretofore are: *lagunitas* Traver, 1935, also from California; and *dulciana* McD., 1935, from British Columbia. The new species *metlacensis* differs from all others of the *albertae* group by reason of: (1) the much more extensive abdominal markings; (2) the small spines (spinules) on the larger central spines of the penes; (3) the dissimilar fore claws of the adult male. The slight crowding of cross veins at the bulla may also be distinctive. General shape of the penes bears much resemblance to these structures in other species of the group, but the lateral spine-like extensions, while present but minute in the holotype, are much less conspicuous, while in the paratype and the subimago males mentioned above are either lacking or still more minute. The new species likewise is considerably larger than any of the others named above.

Nymphs, which by reason of their large size, body structure, dissimilar claws visible within the segmented fore tarsus of a mature male nymph, and markings of thorax and abdomen, are presumed to be those of *metlacensis,* are herewith described.

Head capsule distinctly widened anterior to the eyes and narrowed posteriorly. See Fig. 2. Four blunt teeth or pectinations near tip of each claw, on side of claw, not on lower margin. See Fig. 3. In addition to the thick fringe of long fine hairs on tibiae and tarsi, two irregular rows of more or less parallel short stubby spines on ventral surfaces of each of these segments, best developed on the third leg. Tip of flange at apex of each femur well developed but rather blunt. Femora likewise fringed with long hairs but lacking the blunt spines. Posterolateral spines on abdominal segments well developed (might be termed intermediate between those of *vitreus* and of *longimanus*). Gills of first and seventh pair do not approach one another beneath body of nymph.

General body color dark reddish brown, paler ventrally. Between bases of antennae and backward toward ocelli an irregularly circular darker area enclosing a paler one; slightly darker shading and submedian bands extend backward from ocelli and between eyes. Black markings on pronotum at middle of anterior margin; black spot in posterolateral angle. Black streaks above and behind leg bases on thoracic pleura. Customary black spot near middle of femur, with pale streak extending medially toward base, a shorter triangular streak toward apex, and medial transverse streak. Mature nymphs show considerable brown freckling on upper surfaces of femora, also black pre-apical band. Mid-dorsal black streak on abdominal tergites; reduced to a spot on tergite one, and to a narrow line on nine and ten; on each side of this, on ten, an oblique black streak. On intermediate tergites, this

dark mid-streak is more or less triangular, base of triangle on anterior margin. Posterior margins very narrowly blackish. A fully mature female shows also a black spot on anterior margin, near base of gill; faint indications of a dark oblique streak from this dark spot. A fully mature male nymph shows the oblique lateral streaks well developed on tergites three through eight; background color of six and nine distinctly yellowish, this color forming conspicuous patches on each side of mid-dorsal line on tergite six. Pleural fold dark brown, this color continued ventrally as a dark brown lateral margin of the sternites. Ganglia faintly blackish on seven, eight and nine; indistinct mid-ventral line; narrow dark transverse marks at mid-ventral line on three thru six. Immature nymphs show on each side of the mid-dorsal line of tergites a brown submedian patch closely surrounded by a paler area. Ventrally, an indistinct darker streak parallels the pleural fold on basal and middle sternites; this widens to form an antero-lateral dark triangle on each side of adjoining pleural fold, on sternite nine. Lamellate portion of gills quite large, extending backwards over approximately two and one half segments beyond point of origin. Wide brown band on outer margin; inward from this a pale area followed by a wide purplish portion which occupies more than one half of each gill. A median double brown line in basal half to two thirds indicates position of tracheal trunk. Tails of nymphs pale reddish brown, deeper in color near base in mature forms; very narrowly paler at joinings.

More than 30 nymphs of both sexes, several of these nearly mature, were taken at Metlac, Mexico, on December 26, 1940, by Dr. Hobbs. Presumably the information previously given under the account of the imagos in regard to environmental conditions at the site of collections holds true also for the nymphs.

Nearly mature nymphs of the subgenus *Iron* which by reason of the abdominal markings are presumably *Epeorus* (*Iron*) *metlacensis* were taken in Costa Rica, San Jose, 12 mi. N. of San Isidro del General (Pan. Amer. Hwy.), on July 22, 1962, by G. G. Musser. Still others, all immature, which may represent a different species, are from Jajalipa, Mexico, in the Canadian Zone, at 9,000 ft., taken on July 11, 1955 (collector not indicated.) Both of the above mentioned groups of nymphs are in the entomological collection of the University of Utah, and were sent to me for examination.

References

Banks, N. 1924. Descriptions of new Neuropteroid insects. Bul. Mus. Comp. Zool. 65: 424

Edmunds, G. F. Jr. and **Richard Allen.** 1957 A checklist of the

Ephemeroptera of North America north of Mexico. Ann. Ent. Soc. America 50(4) : 319.

McDunnough, J. 1924. New Canadian Ephemeridae, with notes, II. Canad. Ent. 56: 129.

———— 1929. Notes on North American Ephemeroptera with descriptions of new species. II Canad. Ent. 61 : 177.

———— 1935. Notes on western species of Ephemeroptera. Canad. Ent. 67: 103.

Traver, Jay R. 1935. *In* Needham, James G., J. R. Traver and Yin-Chi Hsu: Biology of Mayflies. Comstock Publishing Co., Ithaca, N. Y.: 405, 410, 412.