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A NEW *SOMATOCHLORA* FROM FLORIDA
(ODONATA-CORDULINAE)

BY E. B. WILLIAMSON AND LEONORA K. GLOYD

To the species of the genus *Somatochlora* found in the coastal region, a new species must be added. It was collected on a high pine area on the eastern side of the Apalachicola River in northwestern Florida by the Williamson-Ditzler Expedition of 1932.

Somatochlora calverti, new species¹

A species closely related to *S. provocans* Calvert and the recently described *S. ozarkensis* Bird (1933).

The characters of the male correspond to those in Walker's key (1925) as far as 15 (p. 48)—*provocans*. *S. ozarkensis* also follows through to 15. In order to include this new species it is necessary to make an insertion before the couplet as given by Bird (1933). His couplet 15a and 15b is identical with 15b and 15b' in the following key. For *provocans* substitute 15a.

- 15a. Dorsum of abdominal segment 10 with a large pale spot; superior appendages without a prominent angle on lateral margin at midlength, and with apices divergent *calverti*

¹ To preserve uniformity in treatment of the species in the genus, the form and terms employed by Walker (*The North American dragonflies of the genus Somatochlora*, 1925) are followed as closely as possible.

- 15a'. Dorsum of abdominal segment 10 without a large pale spot; superior appendages with a prominent angle on lateral margin at midlength, and with apices parallel 15b
- 15b. Superior appendage bent ventrad near the middle at an angle of 30° ; in lateral view terminating in a rounded knob; in dorsal view bent mesad near the middle at an angle of 50° *provocans*
- 15b'. Superior appendage bent ventrad near the middle at an angle of 40° ; in lateral view terminating in a hatchet-shaped process; in dorsal view bent mesad near the middle at an angle of 20° *ozarkensis*

Male.—Labium and labrum pale yellow, lower edge of the latter narrowly margined with dark brown, upper edge with a median dark spot; clypeus and sides of frons, pale yellow, the postclypeus with two dark brown impressed punctae (clypealsinus); lower margin of frons with median bar of dark brown; upper part of frons metallic blue-green, the anterior border slightly curved and confluent with the marginal brown bar or touching it only medianly; vertex metallic violet; occiput brownish black. Pile of head blackish over dark areas, pale over light areas. Rear of head black with a submarginal fringe of whitish hairs.

Prothorax dark brown, lighter on sides, front and hind lobes yellowish white. Synthorax metallic green with violet reflections posteriorly, the brown ground color most evident on the mes- and metinfraepisternum, lower half or third of mesepisternum and ventrally on the intersternum. A pale yellow spot on the mesepisternum, tapering at upper and lower ends, about 2.5 mm. long and 1 mm. broad; lateral thoracic spots yellow and sharply defined, the anterior spot extending almost the whole length of the mesepimeron, about 1.3 mm. broad, slightly concave, both ends more or less rounded; the posterior spot extending from near the base of the hind wing to ventral surface, uniting on the ventrum with the one of the opposite side. A small sigmoid, interrupted, pale yellow streak just behind the metastigma; and another small pale spot, about 1 mm. in diameter, on the metepister-

num near the lateroalar carina. Antealar sinuses and interalar areas pale yellow. Pile rather thin, longer on dorsum and ventrum, pale dull yellow. Front coxae and trochanters, and posterior surfaces of middle and hind coxae, pale yellow; front and middle trochanters, medium brown becoming darker apically; legs otherwise dark brown to black. First tibial keel about $\frac{2}{3}$ length of tibia and margined with pale dull yellow. Wings hyaline, slightly tinged with brown; membranule smoky brown, paler at base; costal, subcostal, and antenodal veins pale yellowish brown; venation otherwise brown to black; pterostigma, medium yellowish brown.

Abdomen.—Segments 1, 2, base of 3 and 10 dark brown, the remaining greenish black with dull lustre; the following parts pale yellow: on 1, postero-lateral edge; on 2, a large subtriangular patch on lower $\frac{2}{3}$ in front of transverse carina with the apex covering the auricles, a smaller patch on posterior portion of genital lobes extending dorsad and uniting with a transverse apical annulus, and a large transverse dorsal spot; on 3, a pair of triangular dorso-lateral basal spots and an elongate spot on basal $\frac{2}{3}$ of segment along ventral margin; on 10, an apical trapezoidal patch with a mid-dorsal threadlike projection extending to base of the segment; other segments without pale spots except for the pale yellow of the intersegmental membranes on dorsum of 5 to 9, very conspicuous on 8 and 9, and for pale streaks along tergal margins, especially on segment 8. Hairs on 1 to 2 and on 5 to 9, light amber; on appendages dark brown or black, longest on dorsum posterior to angulation; otherwise inconspicuous or wanting. Appendages brownish black.

Abdomen a little shorter than hind wings, slender, gradually expanding beyond middle of 4 to the end of 5 or 6, thence narrowing again to the end; apical breadth of 5 slightly less than $\frac{2}{3}$ its length. Genital lobes broadly ovate, their depth about $\frac{1}{3}$ the depth of the abdomen in the same transverse plane. The slenderness of the abdomen and size of the genital lobes are intermediate between *provocans* and the stouter bodied *ozarkensis*. Genitalia not examined.

Superior appendages about as long as $9+10$, or slightly shorter; rather close together at base, curving gently inwards in proximal half; subparallel and somewhat tumid in median region where they are directed ventrad at an angle of about 50° ; narrowing beyond the angulation, lateral margins converging, to half former width; diverging in distal fourth and enlarging slightly before tapering to pointed and laterally compressed apices; lateral carina confined to basal third, ventral carina continuous from base to apex. Inferior appendage about $\frac{7}{8}$ as long as superior appendages, triangular, $2\frac{1}{2}$ times as long as basal breadth; in profile gently curved with upper and lower edges nearly parallel; apex small, rounded, with a small dorsal tooth.

Female.—Unknown.

Venation.—Antenodals: front wing, in first series 7 (2 wings) or 8 (2 wings); in second series 7 (2 wings) or 8 (2 wings): hind wing, 5 in both series (4 wings). Postnodals: front wing, 5 (1 wing) or 6 (3 wings): hind wing, 7 (4 wings). Number of cells between M_1 and M_{1a} : front wing, 10 (2 wings), 12 (1 wing), or 14 (1 wing): hind wing, 11 (1 wing), 12 (1 wing), 14 (1 wing), or 16 (1 wing). Triangles all crossed. Subtriangle of front wing 3-celled in all. Post-trigonal cells in front wing 3 followed by 2, except for a divided 6th in 1 wing, a 6th and 7th in 2 wings, and a 7th and 8th in 1 wing, of the lower series, almost to wing margin; in hind wing 2 followed by 2 for 2 rows, 3 for 3 rows (3 wings) or 3 followed by 2 for 1 row, 3 for 4 rows (1 wing), then increasing. Cells between Rs and Rspl: front wing, 7 (3 wings) or 8 (1 wing); hind wing, 8 (1 wing) or 9 (3 wings). Pterostigma about 4.5 times as long as broad.

Measurements.—Length, male 50.2–52.0; thorax, 9; abdomen, 33–36; segment 5, length 4.4–4.5, width 2.4–2.5; segment 6, length 4.2, width 2.4–2.5; hind wing, length 36–37, width 10.8–11.0; pterostigma, 2.5–2.6; width of head, 8; length of hind femur, 7.5–8.0; superior appendages, 3.5; inferior appendages, 2.9.

Types.—Holotype ♂, Liberty County, Florida, August 25, 1932, E. B. Williamson and others. Paratype ♂, same data. Both in the collection of the Museum of Zoology, University of Michigan.

Affinities.—This species belongs to the *filosa* group as defined by Walker (1925). In general coloration it is very similar to the other members of the group—*filosa*, *provocans*, and *ozarkensis*—differing in having more extensive pale areas, in the presence of the conspicuous trapezoidal spot on the dorsum of abdominal segment 10, and in the yellowish coloration of the costal, subcostal, and antenodal veins. The pale yellow in all the known species of this group is almost white and not at all like the yellow of *tenebrosa*, *linearis*, and *hineana*. The form of the superior appendages is very distinct. The sharp lateral angulation at midlength, present in *provocans* and *ozarkensis*, is represented only by an enlargement or swelling which is more pronounced than in *filosa*. A dorsal view of the distal half of the superiors (see plate) illustrates the homology and yet the distinctness of the characters in that region. From a lateral aspect the appendages bend ventrad at an angle greater than in the other species of the group, suggestive of those of *tenebrosa* and *hineana*. The laterally compressed apices are similar to but smaller and more rounded than those of *ozarkensis*.

Bionomics.—A collecting party of eight,² organized by Mr. E. B. Williamson and Mr. W. H. Ditzler, spent August and September, 1932, in Georgia, Florida, and North Carolina. From August 18 to 29 camp was made at Rock Bluff, a post-office station about 7 miles northeast of Bristol, Liberty County, Florida. On the morning of August 25, the first bright day of sunshine after a week of almost continuous cloudiness and rain, a long pine ridge, less than a mile from the Apalachicola River and about 4 miles by road west of Rock Bluff, was visited. *Somatochlores* were flying quite

² Mr. and Mrs. W. H. Ditzler, Misses Laura and Helen Ditzler, Mr. Beryl Buis, Mr. Mark J. Decker, Mrs. Leonora K. Gloyd, and Mr. E. B. Williamson.

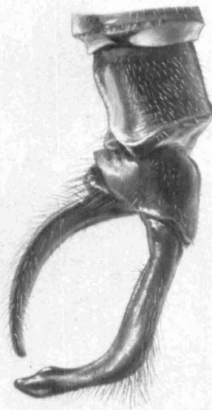
high in the open spaces between the pines and seldom came within reach. Four species were secured, *filosa*, *linearis*, *provocans*, and *calverti*. Stimulated by finding a new species additional visits were made to the ridge on three successive mornings and once in the evening. No more specimens of *calverti* were collected.

Almost invariably the somatochloras were flying with the more numerous *Tramea carolina*. Most of the specimens were taken on the western slope of the ridge where the pines were smaller and there was more undergrowth. As they settled down on dead twigs of pine or oak, 6 to 15 feet from the ground, or were found hanging up in characteristic fashion, we were able to net them. We experienced the same hopeful waiting described by Dr. Calvert (1903) in his attempt to collect *provocans* in New Jersey, and came to appreciate how aptly the species was named.

On the eastern slope of the ridge where the pines were interspersed with Jack oak a mating pair of somatochloras was seen. They alighted about 20 feet high in an oak tree. Efforts to secure them failed, but at the time we thought them to be either *provocans* or the new species. The nearest stream which might be a possible nymphal home was a little less than a half mile to the east. About 200 yards below its source it was 1 to 2 feet wide with numerous waterfalls, sometimes as high as 3 feet, and with frequent small pools. Occasionally on the west side of the stream there was a grassy seepage slope where *Argia bipunctulata* was found. No somatochloras were seen on or in the immediate vicinity of the stream. Another slightly larger stream about the same distance to the west of the pine ridge was also found free of adult somatochloras. From this it would seem that mating and proximity of egg laying sites are not necessarily closely associated, and that the female, probably unaccompanied by a male, appears on the stream only long enough to lay her eggs.

Before this paper was completed Mr. Williamson died quite unexpectedly. Throughout the period of his interest in Odonata, from his first paper in 1898 to his last in 1933, he

A NEW SOMATOCHLORA FROM FLORIDA



Somatochlora calverti



S. calverti



S. ozarkensis



S. provocans

carried on a friendly correspondence with Dr. Philip P. Calvert of the University of Pennsylvania and greatly respected his scientific counsel and advice. It is in appreciation of this relationship that the new species is named for Dr. Calvert.

Miss Grace Eager, Museum Artist, made the beautiful drawings in the accompanying plate. The figures of *calverti* and *ozarkensis* are of the type males; that of *provocans*, of a male compared with the type by Dr. Philip P. Calvert, November 17, 1932. The lower three figures are of a direct dorsal view of the distal half of the superior appendages.

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