NOTES ON TETRAGONEURIA SEPIA GLOYD,  
WITH DESCRIPTIONS OF THE FEMALE AND NYMPH\(^1\)

MINTER J. WESTFALL, JR.

The adults of the genus *Tetragoneuria* have long been a problematical group for odonatologists. Several keys have been submitted for identification of the males, but the females are especially difficult of separation. There is still need for the assembly of more material and a further study of the adults such as those of Muttkowski (1911) and Davis (1933).

Only a few months after Davis published his summary of the genus, a new species, *T. sepia*, was described from Florida by Mrs. Leonora K. Gloyd on the basis of a single male taken near Greenville in Madison County, Florida, September 7, 1932. Since this specimen was flying about a swamp flooded by the adjacent Aucilla River, Mrs. Gloyd stated that it was impossible to say whether the normal habitat of the species was a sluggish stream or swamp pond.

In 1941 I reported the capture of this species in Florida. My first specimens taken were collected from a street in Orlando, at least one-half mile from water. The capture of other specimens in Nassau County and at Lake Redbug, Seminole County was also described. The earliest record yet is of the male taken in early March of 1939 on the west end of the Tamiami Trail by E. M. Davis. Another specimen in the Rollins College collection, according to my notes, was taken March 28 but this specimen has apparently been given away in exchanges and the exact locality is not known. Since that time the species has also been taken in Gainesville and a reared specimen from Tallahassee was recently determined for Mr. William Cross. The latest date of capture is that of a female taken November 15, 1936 in Seminole County by Mr. J. A. Fluno. Lake Placid is now added to the known range and this species appears to be widely distributed throughout the state. It may certainly be expected in Georgia also.

In my collection there are now seven females (others having been given away in exchanges), two of them reared specimens from lots of nymphs from which males also emerged. The others with the exception of the single specimen taken by Fluno were

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\(^1\) Contribution from the Department of Biology, University of Florida.
collected in association with males and have the characteristic appearance of the males. I am now offering a description of the female although a detailed study of all females in the genus is needed but must be left for the future.

Tetragonouria sepioid Gloyd

**Female:** In most details the description of the female follows Mrs. Gloyd's description of the male.

*Head.* Labium light yellow; labrum golden yellow; clypeus and sides of frons olivaceous; front of frons golden yellow, darkening dorsally; upper part of frons black full-width near the vertex, with a metallic blue-black projection forward in the midline, forming a short stem of a T-spot; the dark stem spreads laterally a short distance in some specimens, in others it does not. Face covered with short dark brown pile. **Rear** of head black with a submarginal row of whitish hairs.

*Thorax.* As in male prothorax is brown, except margin of front lobe cream colored. Synthorax sepioid above, which gives the species its name, becoming olivaceous brown on sides; lighter near antecalar sinuses. A metallic blackish stripe on the humeral suture is conjoined below with another dark stripe occupying the lower half of the first lateral suture. This stripe is connected with one on the second lateral by a dark cross band around the metastigma which is itself narrowly outlined with a darker black. There is a distinctive bright yellow spot above and another below the metastigma, similar to those in *T. stella* Williamson but more conspicuous because the pile of the thorax is shorter, less dense, and browner than in that species. Intersternum as in male dark brown. Legs dark brown with exception of the coxae, front and middle trochanters and front femur which are light brown. Legs without tibial keels of male. Front and hind wings entirely hyaline in all seven females. Pterostigma medium to dark brown, darker and distinctly shorter than in *T. stella*.

*Abdomen.* Ground color yellowish brown; large ventro-lateral areas on segments 2 and 3 yellow, almost full-length and margined below with dark brown; segment 4 basally shows a similar yellow in some specimens, in others almost full-length there also; dark band, quite wide, begins on posterior half of segment 3 and becomes blackish brown to form a continuous band on dorsum of 4-10. Ventral margins of 3-7 and lateral carina of 4-8 black; abdominal appendages dark brown. Hairs on 1 and base of 2 brown to whitish, on appendages dark brown, elsewhere inconspicuous or lacking. Appendages about as long as segment 9 dorsally. Subgenital plate as shown in figure.¹

*Venation.* Antenodals, first and second series: front wing, 6 (14 wings); hind wing, 4 (13 wings—one shows 5 in second series only) or 5 (1 wing). Postnodals: front wing, 4 (1 wing) or 5 (10 wings) or 6 (2 wings); hind wing, 5 (10 wings) or 6 (3 wings) or 7 (1 wing). Substigmal series in both front and hind wings beginning between the

¹The drawing of female was prepared by Miss Esther Coogle, staff artist, Department of Biology.
third and fourth antenodals except in 3 hind wings where it is between the second and third. Triangles of front wings once crossed in all specimens; subtriangle of 3 cells (13 wings) or 2 cells (1 wing).

*Tetragoneuria sepsia* Gloyd. Upper figure, photograph of full grown nymph; lower figure, ventral view of segments 9, 10 and appendages of female.
Measurements (in millimeters). Total length including appendages, 37-42; abdomen with appendages, 26-30; appendages 1.7; hind femur 6.7-7; hind wing 27-29.5; pterostigma 2.3.

Material examined. Seven females, all collected in Florida by me, unless stated otherwise. Orlando, April 21, 1940 (designated as the allotype and deposited in the collection of the Museum of Zoology, University of Michigan, along with the holotype); Nassau County, June 7, 1939; Seminole County, April 8, 1940; Seminole County, November 15, 1938, Coll. J. A. Fluno; Maitland, April 28, 1941, Coll. D. W. Thornton; reared specimen from Lake Redbug, Seminole County, emerged June 25, 1948; reared specimen from Lake Placid, emerged May 15, 1950, nymph collected by J. G. Needham and reared by me.

All of the males collected from southern Florida do not show any coloration of the wing base whatever and the membrane is clear. Males from Nassau County only show a coloration approaching that described for the holotype. In these the entire membrane is also slightly smokey.

Nymph: While searching for the nymphs of *Gomphus australis* at Lake Redbug, Seminole County, Florida, in the spring of 1948 with Mr. J. A. Fluno, several nymphs of *Tetragonewria* were found. They were taken from the floor of the lake in a mucky type of bottom, associated with the nymphs of *G. australis*, and transported to Gainesville where they were kept in pillow cages set in gallon jars of water. A male emerged June 10 and a female June 25. Four of the other nymphs were preserved before they emerged. In the spring of 1950 Dr. J. G. Needham brought to Gainesville a number of nymphs of this genus he had taken at Lake Placid. I cared for them hoping they might be the desired *T. stella* which I wished to compare with *seopia*, but when they emerged a male and female of *seopia* appeared on May 10 and May 15 respectively. Several other nymphs were preserved. From this material the following brief description is given.

Raptorial setae of the lateral labial lobe usually 6; four of nine specimens show at base of one side a small seventh which is less than half the size of the others. Mental setae usually 6 + 3 (the first series of 6 larger setae in line, the others out of line at end and smaller); two specimens have 7 + 3 each side, and a third has a small seventh seta in the first series on one side only. Lateral spines on segments 8 and 9, the one on 8 about one-sixth the length of the lateral margin of segment 8 of which it is a part, and incurved. Spines of 9 long and straight, slightly divergent, but varying somewhat in length. In most specimens it is about one-fifth longer than the length of segment 9 at the base of spine. In one specimen
(the one figured) it is almost one-half longer than the shortest distance from base of spine to the front margin of segment 9. The lateral, superior and inferior appendages measured in tenths of the length of the inferiors take as ten are about as 6 or 7:9:10. Dorsal hooks are on 2-9 as in the other species, those on 2 and 3 thin, needle-like, and straight, on 4 thin and decurved toward tip, highest on 5 and 6, becoming low and ridge-like on 9. Wing pads extend to middle of segment 6. Total length 20-21.5 mm., width of abdomen 7.5-8 and width of head 5.5-6.

The nymphs of this genus have not been well known. Needham (1901) presented a key to separate the nymphs of four species, *spinigera*, *cynosura*, *semiaqua* and *spinosa*. His *spinosa* was *canis* and the *semiaqua* was what is now considered *cynosura simulans*. The true *semiaqua* has probably been taken only in the south Atlantic states from New Jersey to Florida. Records from Massachusetts are said by Muttkowski to be doubtful. That species has not yet been reared but a specimen in the Cornell collection from North Carolina has been referred by supposition to *semiaqua*. Broughton (1928) described *stella* from supposition, but it is difficult from the description to be sure that she did not have *sephia*. I hope to successfully rear *stella* soon. Dr. Needham has reared a female of *petechialis* from New Mexico. It was collected at the Bottomless Lakes near Roswell and emerged May 5, 1936. The characters of this and all known species will be given in key and tabular form in the forthcoming *Manual of the Odonata of North America*. In this reared *petechialis* the spines of 9 are long, pointing directly backward, their axes parallel, but they are not quite so long as the distance across 9 from their base to segment 8, whereas in *sephia* and our supposed specimens of *stella* they are longer than this distance. The dorsal hooks of *petechialis* are a little more sharply pointed than in *cynosura*. The adults of *petechialis* and *stella* have been closely associated by students of the genus. How different the true nymph of *stella* is from that of *petechialis* will be known when the former species has also been reared. The specimens Dr. Needham and I have tentatively referred to *stella* have 7 lateral setae consistently and 7 + 3 mentals, also the spines of 9 much like those of *sephia*. Further distinctive characters will be sought when we have reared the remaining species. The nymphs of *spinosa*, *williamsoni* and *morio* (this may not be a valid species) are still unknown. As stated previously we have *semiaqua* and *stella* only by supposition.
BIBLIOGRAPHY


