

A NEW SPECIES OF *GOMPHUS* FROM ARKANSAS
(ODONATA: GOMPHIDAE)¹

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ABSTRACT

Gomphus ozarkensis is described from Arkansas and compared with *G. crassus* Hagen in detail. *G. hybridus* Williamson is removed from the Arkansas state list.

In 1956, when I described *Gomphus septima* from Alabama I examined a number of specimens from the states south of Kentucky that had been determined by various workers as *G. fraternus* (Say), and found that all were of other species. One male sent by George H. Beatty was from DeQueen, Arkansas and had been collected by Alice Ferguson Beatty in 1952. It had been identified as *fraternus*, but in a letter to Mr. Beatty in 1957, I wrote that it was not that species, but possibly an undescribed species and more like *crassus* Hagen. He wrote that I should describe it. This specimen was somewhat teneral, with a wooden toothpick in the abdomen, the end of the abdomen was compressed, and the tip of the penis missing. The terminal abdominal appendages subsequently became broken in shipping. I asked friends to try collecting more of them without success. Finally William F. Mauffray gave me a male and 2 females which he collected in 1965. In spite of the small sample, I have decided to present a description based on this material.

The Arkansas record of *fraternus* (Needham and Westfall 1955) was based on a male and female published by Calvert (1901). These specimens were in 1956 referred by me to *hybridus* Williamson chiefly on the basis of the obscure dark area between the usual 2 lateral dark stripes of the thorax. This character was considered to be quite distinctive in the south for *hybridus*. After recognizing the importance of the characters of the penis in this group (Westfall 1974), I reexamined the fragments of Calvert's 2 specimens. The penis and terminal abdominal appendages of the male (now in alcohol and glycerine) and the subgenital plate of the female were in good condition. These specimens are definitely of the new species here described, so *hybridus* as based on them should be removed from the Arkansas state list.

This new species, known only as yet from Arkansas, is named for the famous Ozark Mountains in which the holotype male was collected. It belongs to the subgenus *Gomphurus* as treated by Needham and Westfall (1955) and well defined by Walker (1958).

Gomphus ozarkensis Westfall, new species

HOLOTYPE MALE: General color dark brown to black, with pale green areas, more yellow on swollen apical segments of abdomen.

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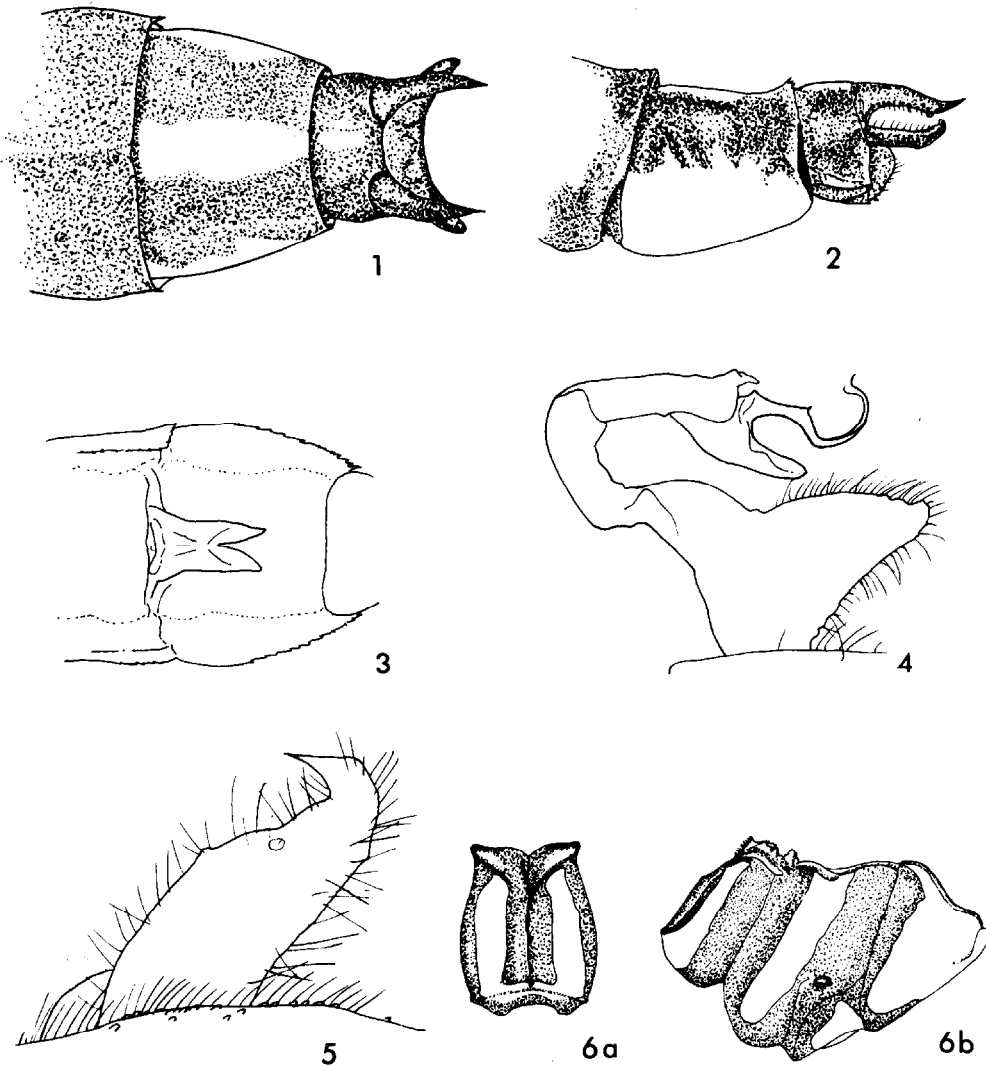


Fig. 1-6. *Gomphus ozarkensis* n. sp.: 1 and 2, dorsal and lateral views of end of abdomen of male; 3, subgenital plate of female; 4, lateral view of penis of male; 5, lateral view of right posterior hamule of male; 6a, dorsal view of thorax with anterior end toward bottom of page; 6b, lateral view of thorax.

Head: Labium pale, border of median lobe darker. Tips of maxillae dark brown. Face pale, with dark brown pits at ends of suture between labrum and anteclypeus. Top of frons pale, a narrow broken line at its base extending just anterior to antennae. Vertex brown, its elevated post-ocellar ridge darker. Occiput pale, its crest slightly biconvex and bearing brown pubescence.

Pronotum: Anterior lobe yellow in middle, brown laterally. Median lobe pale with elevated areas near midline brown, and dark brown laterally above prothoracic coxae and around prothoracic spiracle.

Synthorax: Middorsal carina and collar pale. Middorsal brown stripe widened only slightly anteriorly, a little wider than pale area bordering it

on each side (Fig. 6a). Humeral suture overlaid with brown stripe completely fused with the brown antehumeral stripe to form very wide stripe wider than light stripe on either side of it (Fig. 6b). First and second lateral stripes complete, but darker below, and fused to form wide lateral stripe, slightly lighter in middle. Mesepisternum partly pale. Metinfraepisternum pale in its lower half. Coxa of third leg pale with brown streak across its middle. Lower border of metepimeron suffused with light brown anteriorly, and brown extending along crest above. Legs in general dark brown. Tibiae wholly dark brown. Medial surface of prothoracic femora light brown. Wings with costa yellow, venation brown to black, and stigma light brown. Wing membrane with yellowish cast. No specific venational characters noted.

Abdomen: Mostly dark brown. Dorsal pale band extends full length on segments 1-7, becoming pointed at apices of posterior segments. A broad yellow triangle at base of segment 8, extending about $\frac{1}{3}$ its length. Segments 9 and 10 with dorsal band of yellow entire length, that on 9 about 4 times as wide as that on 10. Sides of 1 and 2, and about anterior 0.33 of 3 broadly pale upward to level of dorsal part of auricle. Segment 1 with dense patch of dark hair just above level of auricle, also with shining black prominence on posterior margin of segment at lower edge of hairy patch. Posterior edge of auricle bearing about 24 prickles. Segments 4-8 with basal pale spots on sides, increasing from less than 0.2 length of segment 4 to 0.5 length of 8. Entire expanded ventral border of 9 yellow, this color extending dorsally for distance equal to about 0.5 length of segment (Fig. 2). Superior appendages dark brown, inferior light brown, becoming black at extreme tips. Superiors about twice length of segment 10, and only slightly longer than inferior. In lateral view superior appendages with a small lateroventral tooth at little more than 0.66 the length from base (Fig. 2). Dorsal side slightly convex in lateral view, turned up near apex. Inferior in lateral view straight basally, but slightly upturned at apex. In dorsal view branches of inferior project laterally beyond tips of superiors for distance equal to about twice width of tips of branches. Posterior edge of inferior appendage broadly concave (Fig. 1). Posterior hamules with shoulder barely visible in lateral view, apex very sharply pointed and bent cephalad (Fig. 5). Penis with peduncle rather tall, of cleft pyramidal type, its posterior edge straight; projection from third segment (termed spine of penis by Calvert in 1921 and prepuce by Walker in 1957) very stout, blunt-tipped, and extending as far as base of flagella of fourth segment; third segment on its opposite side at apex with 2 thin lobes projecting over base of fourth segment; glans penis slightly enlarged near its apex where a small spine is seen on upper surface (examining the insect with ventral side up). Here it bends downward, is abruptly narrow and terminates in 2 long flagella which are about 1.5 times length of fourth segment to upper tooth near apex of glans (Fig. 4).

ALLOTYPE FEMALE: Coloration similar to male holotype. Dorsal yellow marking on segment 9 obscure and on 10 broader and more diffuse than in holotype male. Portion of eleventh segment appearing between appendages is bright yellow. Hind margin of occiput a little less biconvex than in male, nearly straight. An extremely small spine, easily overlooked, on ridge between the lateral ocellus and compound eye. Appendages about 1.25 times

length of segment 10. Subgenital plate (vulvar lamina) more than $\frac{1}{2}$ as long as segment 9 ventrally. Lateral margins almost parallel to tips which are directed caudad. Plate divided medially for about 0.33 of length (Fig. 3).

VARIATIONS: In the teneral male paratype the color pattern of the thorax is very clear, but the dorsal yellow markings of abdominal segments 9 and 10 are not noticeable. All male and female specimens agree in the unusually broad stripes at the humeral suture and on the side of the thorax. Calvert (1901) noted that the hind margin of the occiput of his White River, Arkansas "*fraternus*" female had a slight concavity at the middle, thus differing from his other true *fraternus* which had a convexity there. My paratype female has the occiput slightly more concave at the middle than the allotype.

MEASUREMENTS (mm): Holotype male: total length including appendages 52; abdomen 37.5; hind wing 29; hind femur 9.5. Allotype female: total length 53; abdomen 37; hind wing 31.5; hind femur 10.5. Paratype male: total length 50; abdomen 35; hind wing 29. Paratype female: total length 52; abdomen 37; hind wing 31.

SPECIMENS EXAMINED: Holotype male (No. 722), ARKANSAS, Washington County, Devil's Den State Park, 18-VI-1965; allotype Female (No. 723), ARKANSAS, Montgomery County, Camp Albert Pike, 13-VI-1965; both collected by William F. Mauffray. The holotype and allotype are in the Florida State Collection of Arthropods at the University of Florida in Gainesville.

Paratype male (No. 724), collected 1 mile west of DeQueen, Arkansas, 27-IV-1952, by Alice Ferguson Beatty, and now in the Beatty collection; paratype Female (No. 725), collection data same as allotype except 14-VI-, and now in Florida State Collection of Arthropods.

In addition I have identified as this species the remnants of Calvert's male and female "*fraternus*", the male from Upper Jemmy's Creek, 17-V-1897, and the female from White River, Arkansas, 10-VI-1897. They are in the collection of the Philadelphia Academy of Sciences.

COMPARISON WITH *G. crassus*: The similarity to *crassus* was early recognized, but the columns below indicate the noted differences. Although many of the differences are relative I have found no intermediates and am persuaded that *ozarkensis* is distinct.

| <i>G. ozarkensis</i> | <i>G. crassus</i> |
|---|--|
| Male | Male |
| Middorsal carina dark (Fig. 6a). | Middorsal carina light. |
| Dark antehumeral and humeral stripes confluent throughout (Fig. 6b). | Dark antehumeral and humeral stripes separated in part. |
| Posterior hamule thinner, tapering all the way from base to tip (Fig. 5). | Posterior hamule thicker, broadly curved and not tapering so noticeably from base to tip, thinner only at extreme tip. |
| Superior appendages with tooth farther from apex (Fig. 2). | Superior appendages with tooth nearer apex. |
| Penis smaller; flagella shorter; prepuce shorter, thicker, and less pointed at apex (Fig. 4). | Penis larger; flagella longer; prepuce longer, thinner, and more pointed at apex. |

Female

Dark antehumeral and humeral stripes confluent throughout.
 Occiput from above straight to slightly concave; anterior surface with a distinct bulge.
 Minute spine between lateral ocellus and compound eye.
 Subgenital plate constricted at $\frac{1}{2}$ length from base, divided medially for about $\frac{1}{3}$ its length, lateral margins and tips subparallel (Fig. 3).

Female

Dark antehumeral and humeral stripes separated in part.
 Occiput from above folded over anteriorly and distinctly concave; anterior surface with no bulge.
 Conspicuous horn between lateral ocellus and compound eye.
 Subgenital plate constricted at $\frac{1}{2}$ length from base, divided medially for about $\frac{1}{2}$ its length, lateral margins and tips strongly divergent.

The penis of the male *ozarkensis* is very different from that of *hybridus* (Westfall, 1956). Also the occiput of the female of *hybridus* is strongly convex in contrast to *ozarkensis* where it is straight or slightly concave. In *fraternus* the occiput of the female is also convex, and the penis of the male is very distinct. The nymph of *ozarkensis* is unknown.

ACKNOWLEDGEMENTS

I wish to thank George and Alice Beatty to whom the DeQueen specimen belongs for the privilege of describing the species, although their specimen was not used as the holotype. Thanks are due William F. Mauffray for the three specimens of *ozarkensis* he gave to us. Carl Cook kindly sent me several specimens of *G. crassus* from Kentucky for comparison. The drawings are the work of Esther Coogle and Paul Laessle who are former, and present staff artist, respectively, of the Zoology Department, University of Florida.

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