

SHORT COMMUNICATIONS

THE LARVA OF *GOMPHURUS VENTRICOSUS* (WALSH), AND
COMMENTS ON RELATIONSHIPS WITHIN THE GENUS
(ANISOPTERA: GOMPHIDAE)

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A brief review of larval morphology of *Gomphurus* species indicates that (1) species may be divided into two highly distinctive groups, (2) two species, *G. consanguis* Sel. and *G. rogersi* Gloyd should be removed from *Gomphurus* and (3) *Gomphurus* should be considered a genus, not a subgenus. A larval description of *G. ventricosus* is provided, based on exuviae of adults reared from Scott Co., VA, USA.

INTRODUCTION

NEEDHAM & WESTFALL (1955) included *Gomphus adelphus* Selys, *G. consanguis* Selys, *G. crassus* Hagen, *G. dilatatus* Rambur, *G. externus* Hagen, *G. fraternus* Say, *G. hybridus* Williamson, *G. lineatifrons* Calvert, *G. modestus* Needham, *G. vastus* Walsh and *G. ventricosus* Walsh in the subgenus *Gomphurus*. WESTFALL (1956, 1975) added *G. septima* and *G. ozarkensis*. *Gomphus rogersi* Gloyd was resurrected from synonymy by WESTFALL & TROGDON (1962). Larvae of all of the above species have been associated with adults and described except for *G. adelphus*, *G. crassus* (misassociated by BROUGHTON, 1928), *G. ozarkensis*, *G. septima*, and *G. ventricosus*. I have recently reared *G. crassus* and *G. ventricosus* and have studied exuviae of *G. ozarkensis* reared by P. Harp of Arkansas State University. The larva of *G. crassus* is to be described in a subsequent paper by K. Tennessen and myself.

On the basis of larval structure, especially the form of the prementum and palpal lobes, *Gomphurus* species may be divided into two groups. The first group

possesses strongly hooked palpal lobes with few teeth (3-5, rarely 6), and includes *G. crassus*, *G. dilatatus*, *G. modestus* and *G. vastus*. *Gomphurus lineatifrons* stands somewhat apart from this group but possesses a similar body form. Its unique characters include a deeply concave ligula and dorsal hooks on abdominal segments 7-8. The second group has palpal lobes armed with many teeth (7-9) and an end hook that does not project beyond the level of adjacent teeth, and includes *G. externus*, *G. fraternus*, *G. hybridus*, *G. ozarkensis*, and *G. ventricosus*. Although the larval stage of *G. septima* is not known I assume that it belongs in the latter group due to its apparent relationship to *G. hybridus* as shown by adult characters (cf. WESTFALL, 1956). This leaves three species unplaced, *G. adelphus*, *G. consanguis*, and *G. rogersi*. *Gomphurus adelphus* is a poorly known species, perhaps known only from the type series. Primary references to this species have not appeared since the original description and the larva remains unknown. *Gomphus consanguis* and *G. rogersi* display many structural peculiarities in both adult and larval stages and are possibly distinct at the generic level (LOUTON, 1982). Thus the *Gomphurus* group as previously constituted (NEEDHAM & WESTFALL, 1955) is a polyphyletic taxon and *G. consanguis* and *G. rogersi* should be removed. I believe that *Gomphurus* should be considered a genus instead of a subgenus, based mainly on the existence within *Gomphurus* of the two well-defined subgroups. I predict that Palearctic elements of *Gomphurus* will prove to be a minor lineage representing an early vicariance or that these elements are taxonomically misplaced.

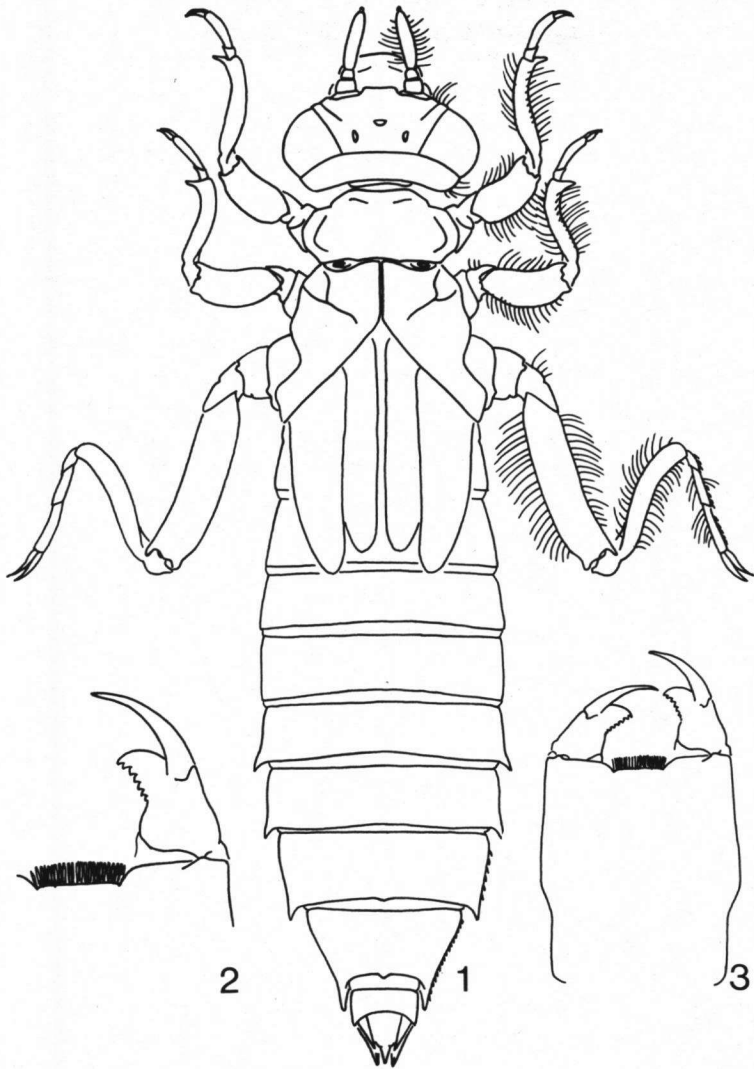
THE LARVA OF *GOMPHURUS VENTRICOSUS*

Figures 1-3

Material examined. — Virginia, Scott Co., North Fork Holston River, 5 mi. upstream from Weber. 6-IV-1976. 1 reared male and exuviae (emerged 7-V), 1 reared female and exuviae (emerged 27-IV).

Diagnosis. — Palpal lobes of labium with 7-9 teeth in line with end hook, ligula straight and without median tooth. Lateral spines of abdominal segment nine about 1.25 times dorsal length of segment ten. Lateral spines of abdominal segments six and seven divergent from lateral margins of segments.

Description. — Exuviae unpatterned, with granular surface, total length 28-29 mm, length abdomen 18-19.5 mm, hind femur 5.43 mm, maximum width head 5.57-5.71 mm, maximum width abdomen 7.57-7.86 mm. (Fig. 1). Third antennal segment 2.6 times length of basal two together. Premental length to width ratio 1.32-1.35 (longest in known *Gomphurus*); lateral margins convergent anteriorly (Fig. 3); ligula narrow, little more than one-fourth width of prementum and bearing usual fringe of scale-like setae but lacking median tooth; palpal lobes slightly longer than movable hook and armed with 7-9 triangular or obliquely truncate teeth, end hook not projected (Fig. 2). Legs moderately long for genus, total body length 5.16-5.34 times length of hind femur. Abdomen relatively



Figs 1-3. *Gomphurus ventricosus* (Walsh): (1) Larva (exuviae), setation omitted from left side; — (2) Detail of ligula and palpal lobe of prementum; — (3) Dorsal view of entire prementum.

narrow, tapering more gradually than most members of genus. Strong lateral spines on segments six to nine, divergent from longitudinal axis of body on segments six and seven (Fig. 1); dorsal hooks on segments eight and nine low and blunt. Lateral margins of abdominal segment eight serrated with 6-7 denticles, segments nine with 16-17. Middorsal length segment eight 2.44-2.62 times middorsal length segment ten, segment nine 2.52-2.77 times segment ten. Lengths of lateral spines of segments six to nine compared to middorsal length segment ten are: spines of segment six 0.37-0.46, segment seven 0.66-0.69, segment eight 0.74-0.77, segment nine 1.26-1.27. Tips of spines of segment nine do not surpass posterior margin of segment ten. Epiproct 1.47-1.52 times length segment ten and 1.4 times length of cerci.

Habitat. — Larvae were collected from a moderate-sized river with a bottom of silt, cobble, and bedrock. The larvae were at the margin of steep soil banks stabilized by roots of terrestrial plants. The distribution of adult collections also indicates a larval preference for medium to large, turbid, rivers.

Range. — Glaciated midwest and New England from Wisconsin to New Hampshire northward into adjacent areas in Canada and southward into the unglaciated portion of the Cincinnati Arch and Ridge and Valley portion of the Appalachian Province.

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REFERENCES

- BROUGHTON, E., 1928. Some new Odonata nymphs. *Can. Ent.* 60: 32-35.
- LOUTON, J.A., 1982. *Lotic dragonfly (Anisoptera: Odonata) nymphs of the southeastern United States: identification, distribution and historical biogeography*. PhD thesis, Univ. Tennessee, Knoxville.
- NEEDHAM, J.G. & M.J. WESTFALL, 1955. *A manual of the dragonflies of North America*. Univ. Calif. Press, Berkeley.
- WESTFALL, M.J., 1956. A new species of Gomphus from Alabama (Odonata). *Quart. J. Fla Acad. Sci.* 19: 251-258.
- WESTFALL, M.J., 1975. A new species of Gomphus from Arkansas (Odonata: Gomphidae). *Fla Ent.* 58: 91-95.
- WESTFALL, M.J. & R.P. TROGDON, 1962. The true Gomphus consanguis Selys (Odonata: Gomphidae). *Fla Ent.* 45:29-41.