

LARVAE OF THE GENUS *GOMPHAESCHNA*  
(ODONATA: AESHNIDAE)

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## ABSTRACT

Larvae of the 2 species of *Gomphaeschna* are extremely similar but can be differentiated as follows: *G. furcillata* (Say) has 6 segmented antennae and pale dorso-lateral spots on thorax and abdomen. *G. antilope* Hagen has 7 segmented antennae and no pale spots. Larvae of both species live clinging to the underside of logs in *Taxodium-Sphagnum* swamps.

Mature *Gomphaeschna* larvae have been described at the generic level by Needham and Westfall (1955) and Walker (1958). Needham and Westfall (1955) illustrated segments 7-10 of the abdomen and the labium of a last instar female exuvia. Walker (1958) figured the head, pronotum, labium, segments 5-10 of the abdomen, and ovipositor of a last instar female larva. Kennedy (1936) reared *G. furcillata* (Say) to the third instar. Cabot (1881) described *G. furcillata* larvae by supposition but apparently was describing *Boyeria vinosa* (Say).

So far as I know, fewer than a dozen larval specimens of *Gomphaeschna* have been collected. Only 3 have been reared. I have before me the 3 reared specimens and 2 larvae. I and others have 3 times searched the swamp where I found 2 specimens but could find no more. Because of the great interest odonatologists have in this subject, and the fact that it may be years before more reared specimens are obtained, I have decided to present my results on the present small sample.

*Gomphaeschna furcillata* was first reared 18-IV-1972 by David L. Nye from a female larva taken in a "cedar" swamp near Gumboro, Sussex County, Delaware. Mr. Nye also found other *Gomphaeschna* larvae and exuviae. The exuviae were 0.6 m above the water on herbaceous plants. Mr. Nye donated the reared female and a last instar larva to Dr. M. J. Westfall, Jr. who held off publishing on them until reared *G. antilope* Hagen became available. After I reared a *G. antilope* Dr. Westfall graciously suggested I use his specimens for comparison. I reared a male *G. furcillata* and a female *G. antilope* from larvae collected 15-II-1976 in Holder Bay, Baker County, Florida. Holder Bay is a dense cypress (*Taxodium*) swamp with a tangled shrub understory. Both species were found in identical microhabitats. The larvae were found clinging to the underside of barkless logs about 8 cm in diameter lying horizontally in shallow pools carpeted with *Sphagnum* moss. A few *Nasiaeschna pentacantha* (Rambur) and *Epiaschna heros* (Fabricius) larvae also were collected in Holder Bay.

The Florida larvae in captivity clung head downward on twigs, but walked about the bottom occasionally, particularly at dawn and during the night. The legs usually were spread, but were drawn to the body when the larvae were disturbed. They would stalk prey for 1-2 cm. The long antennae were held slightly divergent and projecting anteriorly, but were bent laterally while the larvae were eating. After eating, the front tarsi were rubbed past the front of the labium, then rubbed together at the same time that the antennae were rubbed together. The *G. furcillata* larva

first had his spiracles out of water 6 days before commencing to emerge at 0857 on 26-II-1976. The *G. antilope* larva first had her head out of water 7 days before transformation began at 2228 18-III-1976. The male *G. furcillata* took 8 minutes to reach the full hanging out position with all legs free of the exuvia, 29 more minutes to the flex-up position with tarsi grasping the exuvia, and 16 more minutes for the wings to fully expand. Corresponding stages for the female *G. antilope* took 5, 28, and 22 minutes. The wings of both species expanded by unfolding the pleats all along their length simultaneously. The wings of *G. furcillata* were cloudy when expanded, those of *G. antilope* were clear.

The primary features of *Gomphaeschna* larvae have been well described by Walker (1958), but my measurements of the epiproct differ from his. The epiproct of the females is as long as the tergite of abdominal segment 7, not segment 8, measured mid-dorsally. The epiproct of the reared male *G. furcillata* is 1.1X longer than segment 7. Walker (1958) also described the epiproct as being pointed. In all 5 specimens available to me the epiproct is blunt and grooved lengthwise on the underside. Needham and Westfall (1955) described the lateral spines of the abdomen as nearly equal in size. I find they increase progressively in length posteriorly so that the spine of 9 is 1.6-1.8X longer than the spine of 7. The illustrations of neither Walker (1958) nor Needham and Westfall (1955) show a small tooth on each side of the prementum just lateral to the median notch. The lateral margins of abdominal segments 7-9 and the paraprocts are serrate.

The Florida larvae when collected appeared black with a large white median ocellus. In a few hours their color lightened to brown. The male *G. furcillata* had bilateral white spots medial to the mesothoracic spiracles and light spots on abdominal segments 4-9 dorso-laterally at the anterior margins of the segments. His antennae had segments 2-6 pale tan distally. The female *G. antilope* had no noticeable light spots, and the entire antennae beyond segment 2 were pale. The exuviae of both species have a pattern of dark spots laterally on abdominal segments 4-9, as shown in Needham and Westfall's (1955) photograph.

The comparison which follows is based on the 3 reared specimens available. All 3 exuviae are 31 mm long with the abdomen 20 mm long and 6 mm wide. Many characters were examined and found to be so nearly identical or so variable that I believe no separation of the species is possible using them. These include the size and proportions of the head, labium, legs, lateral abdominal spines, ovipositor, ventro-lateral abdominal sclerites, and anal appendages. The major differences between *G. antilope* and *G. furcillata* larvae are that *G. antilope* has 7 antennal segments and no pale dorso-lateral spots on the thorax and abdomen while *G. furcillata* has 6 antennal segments and pale dorso-lateral spots on the thorax and abdomen. It is possible that the 1 reared *G. antilope* is a mutant. The antennae of *G. furcillata* have a slight groove around segment 6 just where the joint between segments 6 and 7 occurs in *G. antilope*. Since 1 of the differences between adults of the 2 species of *Gomphaeschna* is the broader hindwing of *G. antilope*, the ratio of length (costal margin) to greatest width of the hindwing sheath in the larvae may be significant. This ratio is more than 3.1:1 in *G. furcillata* and 2.8:1 in *G. antilope*.

I also had available for examination a male last instar larva collected

by D. L. Nye at Gumboro, Sussex County, Delaware, 16-IV-1970. Total length is 29 mm, abdomen 19 mm long and 6 mm wide, and hindwing sheath 5.7 mm. The hindwing sheath extends just beyond the middle of abdominal segment 4. This specimen probably is *G. furcillata*, for it has 6 antennal segments and pale dorso-lateral spots on the abdomen. The ratio of length to width of the hindwing sheath, however, is 2.7:1. This ratio may change with growth or during emergence. This male larva has the ante-apical tubercles of the epiproct located at 0.37 of the length of the epiproct measuring from the base. In the reared male *G. furcillata*, they are 0.36 out from the base of the epiproct.

The fifth *Gomphaeschna* specimen I studied is a male with 6-segmented antennae collected by Roback in the Savannah River, South Carolina 16-IX-1972. It is overextended but measures 19 mm in total length, abdomen 13 mm long and 3.8 mm wide, and hindwing sheath 1.2 mm. The hindwing sheath extends to half the length of abdominal segment 2. The rear corners of the head are more angulate than in the last instar.

All 5 specimens I studied are now in the Florida State Collection of Arthropods in Gainesville.

#### LITERATURE CITED

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