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A New Species of *Gomphus* (Odonata) related to *G. fraternus*.

BY E. B. WILLIAMSON.

In eastern North America the hitherto recognized species—*externus*, *fraternus*, *crassus*, *dilatatus* and *vastus**—constitute a group of the genus *Gomphus* characterized by the form of the postanal cells, the color pattern of the thorax, and especially by the abdominal appendages of the males. *Dilatatus* and *vastus* have the fronto-nasal suture black, and the eighth abdominal segment immaculate above, the face being unmarked and segment eight having a basal yellow or yellowish spot in *externus*, *fraternus* and *crassus*. The following species which appears new finds its nearest ally in *fraternus*. Dr. Calvert's recent critical study of *fraternus*, *externus* and *crassus* (ENT. NEWS, March, 1901, pp. 65-73, pl. iii, 18 figures) makes it possible to describe this species without indicating at length points of difference and similarity. What is here said constitutes a fourth vertical column as an addition to the three vertical columns of descriptive matter in Dr. Calvert's paper.

***Gomphus hybridus* n. sp.**

Abd. ♂, 35-37; ♀, 35-36. H. w. ♂, 27-8; ♀, 29.

(1). Superior abdominal appendages viewed from above not as robust as *fraternus* and *crassus*, with the apices slenderer, separated by a distance greater than the length of one appendage;

(2). inner edge of each appendage concave in general direction, straight

* I know *ventricosus* and *consanguis* only from descriptions. They seem to be most closely related to *vastus* and *dilatatus*.

or slightly convex from about its middle to near the apex ; the outer edge straighter than in *fraternus*, particularly at base, not angulate ;

(3). in profile upper edge convex ;

(4). the lower edge tapering to the apex in its apical fourth or fifth, a small tubercle (larger than in *fraternus* or *crassus*) where the tapering begins, at which point the appendage is hardly thicker than elsewhere in its post-basal portion ; between this tubercle and the apex the edge is concave without a convexity as in *fraternus* ;

(5). viewed obliquely from above at 45° with the horizontal plane the appendage shows no tubercle basally to the one seen in profile.

(6). Branches of inferior appendage with the apices barely outside of or just at the outer edge of the superior appendages ;

(7). undivided portion when viewed from below with the edge between the branches forming an undulating curve, less than a semicircle, or with a short portion at the middle straight, in either case a distinct concavity before the apex of each branch.

(8). Vulvar lamina less than half as long as the sternum of the ninth segment, widened at its base as in *fraternus* ; from this widened portion the sides extend parallel to the apices of the two contiguous branches, the incision between which has usually an angle of almost 90° , with the sides straight or slightly convex.

(9). Third femora of female without external yellow stripe.

(10). Dark stripe on first lateral suture in both sexes not interrupted.

(11). Vertex of female with a brown or whitish spine at either end of the transverse ridge.

(12) In both sexes tibiae black, the superior surface with a pale yellow stripe, usually extending from the base to about the middle, rarely to the apex, and rarely reduced to a basal spot or streak.

(13). Dorsal spot on seventh abdominal segment of male one-half to three-fifths as long as the segment.

(14). Second femora of female beneath dull brownish, obscure green towards apex.

(15). In both sexes the tenth abdominal segment is obscure brown, paler than segments eight and nine, with a round, yellow, median, dorsal spot, which may be so obscured as to be almost invisible.

(16 and 17). Segments seven, eight, nine and ten are obscurely marked and shaded with black, brown and yellow, their general color being lighter than the segments before them, ten being the palest one ; the color pattern on these segments is not as sharply defined as in related species, being in general, like *fraternus*.

(18). Margin of occiput similar in outline in both sexes ; slightly higher in the female, high, uniformly convex or, more rarely, with the sides straightened or very slightly concave.

(19, 20 and 21) See (16 and 17) above.

Suture between nasus and frons obscure, slightly darker than the adjacent parts, best shown in very teneral individuals which also show

the same dusky color on the anteclypeus. Prothorax largely yellowish. United mid-dorsal thoracic stripes wider than in *fraternus*, widening below, as in *vastus*, to a greater or less extent, so that the pale area between the antehumeral and median stripes is greatly reduced, as compared with *fraternus*; humeral and antehumeral distinct, rarely fused for a short distance above; stripes of lateral sutures complete, the area between more or less obscured. Femora reddish brown, paler below; second tarsal joint yellowish dorsally, most distinct and sometimes evident only on last tarsi, rarely obscured throughout. Abdominal segments two to six black, marked with yellow and green. Accessory genitalia of male pale brown; the hook of the second hamule, bounded apically and basally by a small black tooth, shorter and weaker than in *fraternus* and *crassus*.

Referring again to the items in the description above, numbered (1) to (12), *hybridus* is separated from *fraternus* by (4), (7), (8), (9), (10) and (12); from *externus* by (1), (2), (3), (4), (6) and (7); from *crassus* by (2), (4), (5), (8), (9), (10), (11) and (12). Or *fraternus* and *hybridus* are alike, with possible slight differences, in (1), (2), (3), (5), (6) and (11); *externus* and *hybridus* in (5), (8), (9), (10), (11) and (12); *crassus* and *hybridus* in (1), (3), (6) and (7). *Hybridus* differs most widely from *crassus*; the male is very closely related to *fraternus*, while the female has more resemblances to *externus*—a condition which justifies the specific name proposed.

Described from 32 specimens—15 ♂ and 17 ♀:

Cumberland River, Nashville, Tennessee, below the State Penitentiary: May 12, 1901, 1 ♂; May 15, 1901, 1 ♂, 1 ♀; May 19, 1901, 1 ♂, 1 ♀; May 22, 1901, 1 ♂, 3 ♀; May 23, 1901, 6 ♂, 5 ♀; May 30, 1901, 1 ♀; June 2, 1901, 1 ♂; June 6, 1901, 1 ♀; June 7, 1901, 2 ♂, 2 ♀.

Cumberland River, above mouth of Stone River: May 16, 1901, 1 ♂, 3 ♀.

Stone River, near Cumberland River: May 16, 1901, 1 ♂.

Unfortunately much of this material is so teneral as to be of little or no value, and for this reason doubtless some variations have been overlooked. Exuviae of the species were collected. Specimens of these have been sent to Prof. Needham. The types of the species are placed in the Museum of Comparative Zoölogy, Cambridge, Mass.



Williamson, E.B. 1902. "A new species of Gomphus (Odonata) related to G. fraternus." *Entomological news, and proceedings of the Entomological Section of the Academy of Natural Sciences of Philadelphia* 13, 47-49.

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