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THREE NEW NORTH AMERICAN SPECIES OF
GOMPHINAE (ODONATA)

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THE three species described below are representatives of three different genera, *Gomphus*, *Stylurus*, and *Gomphoides*, from North Carolina and Tennessee, South Carolina, and Florida, respectively.

***Gomphus rogersi*, new species**

TYPE MALE.—Pale colors are a light greenish gray unless otherwise stated.

Head (Pl. I, Fig. 5): Labium pale, the median lobe and tips of lateral lobes black. Labrum pale with the black band along the base and apex joined medianly by a bar of equal width. Mandibles pale, mesal margin and tips black. Genae black. Anteclypeus pale; postclypeus with a broad black band covering the fronto-clypeal suture and reaching down to include the fronto-nasal punctae. Frons pale, basal two-fifths of dorsal surface black extending laterally to join the black of the fronto-clypeal suture. Vertex and dorsal surface of occiput entirely black. Rear of the head black except for a large pale spot on the under surface of the occiput and a small area along the eye margin ventrally.

Prothorax predominantly black: front lobe with broad pale

margin; middle lobe with a small median and a lateral antepical geminate spot pale; hind lobe entirely black.

Synthorax (Pl. I, Fig. 6), largely black dorsally, pale laterally. Mid-dorsal carina to its angulation and mesothoracic half-collar, pale. Dorsal mesepisternal pale stripes slightly divaricate, confluent with the half-collar below but not reaching the antealar carina above. Pale antehumeral greatly reduced, represented above by a round spot near the antealar carina and below by a stripe about three-fourths the length of the humeral suture. Black posthumeral broad, about one-third the width of the mesepimeron, confluent with the black of the mesepisternum. First lateral stripe interrupted; represented by a black bar in its upper fifth and its lower two-fifths, the former joined along the antealar carina above and the latter broadly below with the posthumeral. Second lateral stripe wedge-shaped, widest near the lateroalar carina; narrowly and obscurely connected with the anterior latero-ventral black area of the metepimeron. Upper three-fifths of the mesinfraepisternum and upper half of the metinfraepisternum black. Antealar sinus black. Intersternum with a large, smoky black spot.

Coxae pale with a basal black spot; legs otherwise entirely black. First tibial keel brown, low, inconspicuous, about one-third the length of the tibia. Armature of the legs black, not pronounced; spines of femora short, arranged in two rows, one on the antero-, the other on the postero-ventral edge.

Abdomen black with pale areas as follows: on segment 1, a large mid-dorsal and a large ventro-lateral spot; on segment 2, a narrow mid-dorsal stripe reaching from base to apex, a small basal mid-lateral spot, an antepical spot joined with a long median ventral area along the margin, and the upper and lower surfaces of the auricles; on segment 3, a very narrow mid-dorsal stripe four-fifths the length of the segment, a latero-ventral basal spot prolonged narrowly along the margin to the apical integument; segments 4 to 6 entirely black except for a minute wedge-shaped basal spot; on segment 7, a mid-dorsal hair line for two-thirds the length of the segment, a

small anteapical yellow spot on lateral margin; on segments 8 and 9, lateral margin from base to apex and intersegmental integument yellow. Segment 10, entirely black. Urosternites on segments 1 and 3 to 10 black.

Hamules (Pl. I, Fig. 4) brownish black. First hamule in lateral view extends about 0.66 mm. beyond the lateral margin of the tergite; laminate, enlarged in apical third with the mesal portion directed slightly caudad; two small teeth near the apex on lateral margin; apical margin flattened and narrowly recurved giving a rolled appearance. Second hamule large, extending about 1.14 mm. beyond the lateral margin of the tergite; cephalic margin, beginning at about a third of its vertical length, directed caudad at an angle of approximately 130° for 1.3 mm. and terminating in a broad, recurved hook.

Abdominal appendages (Pl. I, Figs. 1-3) black, inferior brownish dorsally. In dorsal view the inner and outer margins of each fork of the superiors are subparallel almost to the apex where the lateral cuts in abruptly to join the inner margin forming an acute and sharp point. In lateral view the superiors are without prominent angulations except for a comparatively small anteapical ventral tooth.

Paratype males are like the type except for a few variations in the thoracic color pattern. In one specimen the dorsal mesepisternal pale stripes are distinctly separated from the mesothoracic half-collar. In another, the pale antehumeral stripe is complete.

FEMALE (paratype).—The coloration is similar to the male with the following exceptions.

Head: Labium pale, the median lobe and tips of the lateral lobes dusky. Anteclypeus margined with dark brown basally and laterally; dusky brown above. The dorsal surface of the occiput is black but narrowed mesially so that the large pale area of the postero-ventral surface is visible from a dorsal view.

The hind lobe of the prothorax has a small median yellow spot.

Synthorax: Mesepisternal pale stripes are very narrowly

separated from the mesothoracic half-collar. Pale antehumeral is complete.

Abdominal segments 4 to 10 are missing.

Venation, including costa, black; pterostigma light brown, slightly smoky. Antenodal crossveins: front wing, type 13, ♂ paratypes 13-16, ♀ 14; hind wing, type 10-9, ♂ paratypes 9-10, ♀ 10. Postnodal crossveins; front wing, type 15-13, ♂ paratypes 11-14, ♀ 14-12; hind wing, type 14, ♂ paratypes 11-14, ♀ 12-11. Pterostigma about 6 times as long as broad, covering 5 to $7\frac{1}{2}$ cells. Triangle, internal triangle, and supra-triangle are without crossveins.

Measurements in millimeters. Length of abdomen including appendages, type 37, paratypes 36-37; in lateral view, superior appendages, type 1.5, paratypes 1.38-1.55, inferior appendages, type 1.3, paratypes 1.23-1.29. Hind wing, type 32.7, ♂ paratypes 32-33.5, ♀ 33.3; stigma, front wing, type 3.42, ♂ paratypes 3.04-3.42, ♀ 3.6-3.9, hind wing, type 3.8, ♂ paratypes 3.42-4.18, ♂ 4.05-4.18.

Material examined.—Long Creek, Fentress County, Tennessee, June 18, 1924, 2 ♂ (type ♂), Dr. J. Speed Rogers, in the Williamson Collection, Museum of Zoology, University of Michigan. North Fork of the Swannanoa River, near Black Mountain, Buncombe County, North Carolina, May, 2 ♂ 1 ♀, Mr. Nathan Banks, Museum of Comparative Zoology, Cambridge, Massachusetts.

Of the habitat of this species Dr. Rogers writes:

. . . Catalog number 38: taken from the headwaters of Long Creek, about 2 miles west of Allardt on the Allardt-Jamestown road. Long Creek is here a sand-bottom brook, about 4 to 6 feet wide and up to 18 inches deep with the usual alternation of pools and riffles. At this point it flows thru a narrow, shallow valley in a relatively level part of the plateau and within a mile of the divide between South Fork and the Obey River (the main branches of the Cumberland River, in this portion of the plateau). Most of the creek is wooded but number 38 refers to collections made from a cleared portion, with only an occasional clump of alders. I don't remember taking the dragonflies but they must have been patrolling the creek. The craneflies of this number were typical open creek (unshaded creek bank) forms.

Gomphus rogersi is most closely related to *brevis* Selys and *parvidens* Currie. Specimens of *parvidens* were not available for direct comparison but the description and figures, as given by Miss Currie (1917), show without doubt its distinctness from that species. *G. rogersi* differs from *brevis* and *parvidens* in the following characters: dorsal surface of the occiput entirely black; mesothoracic half-collar not divided by black; second lateral thoracic stripe incomplete or obscurely connected; prolongation of apex of the superior appendages in dorsal view is toward the mesal side; first hamules longer and the anterior margin of the second hamules less angulate than in either species.

The species is named in honor of Dr. J. Speed Rogers of the University of Florida, in appreciation of the many specimens of Odonata which he has presented to the Museum.

Dr. Philip P. Calvert and Dr. Clarence H. Kennedy have kindly examined the specimens of *Gomphus rogersi* and have confirmed my opinion of the distinctness of the species.

Stylurus townesi, new species

MALE.—The light areas of the face and top of head (Pl. II, Fig. 5) are a pale greenish yellow. Labrum, genae, anteclypeus, and postclypeus pale; fronto-clypeal suture marked by a fine brown line. Frons predominantly pale; posterior margin of the dorsal surface brown, narrowed near the mid-line. Vertex brown to the crest of the postocellary ridge; pale posteriorly, slightly darker near the occiput, a short spine on the laterocellary ridge at about mid-length. Occiput pale; a fine brown line on suture between it and vertex and along eye margin; hind margin slightly concave, bearing a row of brown hairs. Rear of head with a brown band along the dorsal margin of eyes and a brown area around the occipital foramen above; laterally, and in lower half, pale yellow.

Prothorax with about equal areas of brown and pale yellow: front lobe margined with yellow, a median pale spot bordered laterally by brown spots which are suffusely connected posteriorly; middle lobe brown, pale laterally with a

large median area posteriorly which is continuous with a smaller median pale area on the hind lobe.

Synthorax (Pl. II, Fig. 6) with light areas pale grayish green dorsally, more yellowish laterally and ventrally; dark areas, deep rich brown. Mid-dorsal carina to its angulation and mesothoracic half-collar, pale. Dorsal mesepisternal pale stripes converge toward the junction of the antealar and mid-dorsal carinae above, separated from each at this point by a distance equal to one-fourth the width of a pale stripe, and separated below from the mesothoracic half-collar by half and from the mid-dorsal carina by twice the width of a pale stripe. Antealar sinus entirely brown. Pale ante-humeral stripe about the same width as the mesepisternal pale stripe, curved, slightly narrower at mid-length and expanded above but not touching the antealar carina. The brown humeral stripe is divided lengthwise by a narrow pale stripe slightly obscure in the dried specimen, incomplete below, and about equal in width to the brown on either side. Brown stripe on first lateral suture narrow, about 0.3 mm. wide, joined above with the lateroalar carina and extending below to about four-fifths of the length of the suture. No brown stripe on the second lateral suture.

Coxae and trochanters pale yellow, the latter brownish apically. Femora of first and second pair of legs dorsally and of the third pair apically dark brown, otherwise pale yellow. Tibiae and tarsi very dark brown; the first tibia with a pale, apical, ventral, median, low keel, about 0.6 mm. in length. Trochanters and femora spinulose beneath; the spines and spicules of femora most numerous basally, dividing roughly into two rows apically. Spines and spicules black; hair on coxae and trochanters scanty and pale.

Venation. Costa yellow to the pterostigma, remainder dark brown; pterostigma light brown; venation otherwise dark brown. Antenodal crossveins: front wing, 13; hind wing, 8-9. Postnodal crossveins: front wing, 10; hind wing, 11-10. Anal triangle 3-celled. Pterostigma about 5 times as long as broad.

Abdomen long and slender, dilation of 7 apically and of 8

and 9 moderate, noticeably less than in *Stylurus laurae*. Segment 1 with the obscure brown area in dorsal basal half united to a dorso-lateral bar of the length of the segment; dorsal apical half and most of lateral area pale grayish yellow. Segment 2 brown dorsally with a median sinuate stripe, about one-fifth the width of the segment and extending from base to apex, pale dusky yellow; laterally predominantly pale. Segments 3 to 6 dark brown with a narrow obscure mid-dorsal stripe and lateral margin, pale dusky yellow. Segments 7 to 9 dark brown, yellow as follows: on 7, a narrow mid-dorsal pale stripe from base to two-thirds the length of the segment, broad lateral stripe as long as and half as high as the segment; on 8, a dorsal basal triangular spot slightly less than half the length of the segment and a large lateral rounded area, wider than on segment 7, obscurely margined with brown ventrally; on 9, a large lateral spot in basal half, blending with reddish brown apically and along lateral margin. The yellow on 8 and 9 is a deep rich color in contrast to the pale grayish areas of the other segments. Segment 10 brown dorsally, gradually blending with the lateral yellow. Intersegmental integument of 7 to 9 bright yellow. Urosternites of segments 3 to 6 a medium dark brown, of 7 brown becoming yellowish apically, of 8 to 10 a bright yellow.

The hamules are of the same general shape characteristic of species of the genus *Stylurus* (Pl. II, Fig. 5). First hamule slender, almost straight, short, apex rounded. Second hamule laminate, in profile with nearly parallel margins in basal two-thirds; the anterior margin in apical third slopes obliquely backward, slightly concave, joining the posterior margin to form an acute, cephalad-directed apex. Both hamules are a pale grayish green with brown tips; the enlarged spermathecal vesicle is pale yellowish brown. In *S. laurae* these structures are all dark brown or black.

Abdominal appendages dark golden brown, more yellowish ventrally. Superior appendages slightly longer than the inferior and in dorsal view about the same length as the tenth segment. The branches of both superior and inferior appen-

dages are divaricate, inclosing approximately an angle of 90°, and exhibit no prominent teeth, hooks, or angulations (Pl. II, Figs. 1-3). The lamina supra-analis is pale yellow in color and crescent-shaped with the distance between the points much greater than the maximum depth.

Measurements in millimeters. Length of abdomen, including appendages, 38.3; superior appendages (laterally) 1.6, inferior, 1.52; segment 7, 4.3; segment 8, 3.4; segment 9, 2.3. Hind wing, 33; pterostigma, front wing, 3.6-4.0; hind wing, 4.0. Length of third femur along dorsal surface, 6.0.

Holotype ♂, South Saluda River near Greenville, South Carolina, August 13, 1931, Henry K. Townes, Jr., in the Williamson Collection of the Museum of Zoology, University of Michigan.

FEMALE unknown.

Concerning the habitat and circumstances under which the unique male was taken, Mr. Townes wrote:

The specimen was taken in Greenville Co., South Carolina on the South Saluda River a few miles below the reservoir at Table Rock Mountain. The river here is about 25 ft. wide, 1½ to 4 ft. deep, and moderately swift. Except for the fact that it is somewhat siltier, and warmer from its exposure to the sun in the reservoir, this river presents the same appearance and ecological situations as that stretch of the North Saluda River on which Mr. Williamson collected *Stylurus laurae*.¹ I was wading down the river at night with a lantern in my hand when the specimen lit on my bathing suit just above the water.

According to the criteria set forth by Williamson (1932), *Stylurus townesi* belongs in the *intricatus* group of the genus, and is most closely related to *amicola* and *laurae*. It has some of the color pattern characters of each but in a different combination from either. The pale mesothoracic half-collar is confluent with the pale mid-dorsal carinae as in *amicola* but extends across the full width of the thorax. It differs from both species in having a wider pale antehumeral; a complete first lateral brown stripe; no second lateral brown stripe; legs much paler; and face entirely pale except for a

¹ Williamson, 1932: 10-11.

fine hair line on the fronto-clypeal suture. The second hamules are more robust than those of *amnicola* and less so than those of *laurae*, and the apices are curved more strongly cephalad than in either species.

The unique male was sent by Mr. Townes to Mr. E. B. Williamson in January, 1933. At that time it was determined as a new species but was not described immediately in the hopes that more specimens could be obtained. Recently Mr. Townes donated the specimen to the Williamson Collection, and in compliance with his wishes it is here described. I take pleasure in naming the new species in his honor.

Gomphoides williamsoni, new species

The taxonomic status of the name *Gomphoides* has been the subject of dispute since the genus was first described by Selys in 1854. The names of *Aphylla*, *Cyclophylla*, and *Progomphus*, proposed in the same publication for related groups of species, are also involved in the controversy. Furthermore, Muttkowski (1910) gave evidence to show the necessity of a new name, *Negomphoides*, for *Gomphoides*. The whole complicated problem is reviewed by Cowley (1934) who concludes that *Negomphoides* should be adopted. A study of the relationships of the species within the genus, however, may alter the entire situation and in view of the present uncertainty, preference is here given to *Gomphoides* as used by Selys, Calvert, Williamson, and others in various publications.

TYPE MALE.—Labium and mandibles pale brown, the latter dark brown apically. Pale colors of face and top of head, light yellowish green. Labrum narrowly bordered with pale brown. Clypeus pale, an obscure brown bar between the ante- and postclypeus. Frons, lower surface almost entirely covered by a brown bar joined laterally to the basal brown of the dorsal surface. Vertex brown, a pale spot anterior to each lateral ocellus, and a pale more or less obscure spot posterior to the postocellary ridge. Antennae brown, first segment with pale apical ring. Occiput pale, obscurely margined with brown, under surface with a large pale median spot. Rear of

head light golden brown with a cream colored pale border along the lower half of the eye margin.

Synthorax (Pl. III, Fig. 5) with the brown areas of three tones; the pale markings of a slightly greenish yellow. Mid-dorsal carina to a point slightly beyond its angulation, pale. Dorsal mesepisternal pale stripes divaricate and slightly wider toward the base, broadly joined to the mesothoracic half-collar and reaching above to the antealar carina. Antehumeral pale stripe almost obsolete, represented in the median third or fourth by a narrow arcuate line about 0.2 mm. wide and by a small isolated spot near the antealar carina. Mesepimeral pale stripe complete, about 1.3 mm. wide, slightly constricted above before the apical expansion. Metepisternal pale stripe about 0.8 mm. wide, obscure in outline below, narrowly connected above with a small spot near the lateroalar carina. Metepimeral pale stripe broad, about 1.5 mm. wide, complete. Dark areas are as follows: mesepisternum uniformly dark brown; on mesepimeron, narrow border of the pale stripe dark brown, the humeral area and remainder, medium brown changing to golden brown in extreme lower portion; mesinfraepisternum medium to golden brown; metepisternum, medium brown above, becoming golden brown below; metinfraepisternum golden brown; metepimeron, stripe along second lateral suture and lower portion golden brown, remainder medium brown.

Coxae light brown. Trochanters golden brown. Femora of first pair of legs pale greenish yellow ventrally, the dorsum and second and third pair entirely golden yellow except for a dark brown ring at the apex. Tibiae and tarsi brownish black. Spines of the trochanters and femora short, black, and rather dense; bristles golden brown, most numerous on the trochanters.

Costa bicolored; dorsal half and from pterostigma to apex, dark brown or black; ventral half pale yellow, the setae black. Pterostigma light brown. Venation otherwise dark brown or black.

Abdomen long and slender; dilation of segments 7 to 9

moderate. Segment 1, medium to golden brown with a pale, greenish yellow, mid-dorsal spot reaching from base to apex, and an apical latero-ventral spot on each side. Segment 2 with a mid-dorsal, pale yellow stripe about one-fifth the width of the segment and expanded in the middle; brown of the dorsum dark, gradually becoming golden laterally; auricles pale grayish yellow. Pattern on segments 3 to 7 blended and not sharply defined: dark brown mid-dorsally, apically, and latero-ventrally; transverse carina marked with dark brown, laterally separating large yellowish or greenish spots on either side of it; segment 3 with a basal mid-dorsal pale yellow lanceolate spot narrowly reaching the transverse carina; segments 4 to 6 with an indistinct and interrupted pale mid-dorsal hair line; segment 7 with a narrow, pale mid-dorsal line from base to apex. Segments 8 to 10 reddish brown (brilliant burnt orange in life) becoming yellowish laterally; lateral dilation of segment 8 and the narrower dilation of segment 9, bright (cadmium) yellow; apex of segment 10 with a median notch, the margin on either side of it narrowly bordered with dark brown extending laterally, on both inner and outer surface of the distinct postero-inferior lateral projection, almost to the tip. Segment 9 is slightly longer than 10. Urosternites of segments 3 to 6 medium to dark brown; segment 1, pale brown; segments 7 to 10 golden yellow.

Accessory genitalia of second abdominal segment largely golden brown. First hamules prong-like, prolonged, directed caudad and curved dorsally; dark brown apically. Second hamules stout, rotund, with a prominent shiny black hook on the apical caudo-mesal margin.

Superior abdominal appendages about the same length as the tenth segment; reddish brown in basal two-thirds, dark brown apically; a scar-like area on the mesal surface near the point of greatest curvature, yellow. The inferior appendage is represented by a blunt tongue-like process which does not extend beyond the level of the apex of segment 10. Details of the shape of the appendages are shown in Plate III, figures 1 to 3.

ALLOTYPE FEMALE.—Similar to the male. The head pattern is essentially the same. The middle lobe of the prothorax is pale laterally. The thoracic pattern differs slightly, although within the variation for the species, in having the dorsal mesepisternal stripes less broadly joined to the mesothoracic half-collar below, and above narrowly and obscurely joined along the antealar carina to the isolated pale spot of the almost obsolete pale antehumeral. Metepisternal pale stripe slightly broader, complete.

Abdomen more robust, segments 7 to 9 less dilated than in the male; color pattern similar; segment 1, pale latero-ventrally; a broad, lateral, pale, grayish green band on 2 from base to apex; lateral black along the ventral margin of 3 to 6 broader and darker; lateral dilation of 8 narrower, inconspicuous on 9; no postero-inferior lateral projection of the apex of segment 10. Segments 9 and 10 of about equal length and longer than wide. Appendages slightly greater than half the length of segment 10, conical, light brown with sharp black tips. Processes of the vulvar lamina extend below the level of the apex of segment 8 (Pl. III, Fig. 4).

Paratype males and females show considerable variation in some portions of the thoracic pattern (Pl. III, Fig. 5), not all of which is due to the degree of maturity. The isolated dot of the pale antehumeral is narrowly joined along the antealar carina to the dorsal mesepisternal stripe in 10 ♂; the antehumeral is represented by a dot only in 20 ♂ 3 ♀ and entirely lacking in 21 ♂ 2 ♀; the metepisternal pale stripe is reduced and divided in 1 ♀, represented only by a dot near the latero-alar carina in 3 ♂ 1 ♀, entirely obscured or lacking in 12 ♂. There are 18 different combinations of these variable elements. The abdominal pattern also varies in the extent of development and intensity. The palest teneral male shows dark markings only on the transverse carina of 3 to 7, integument of 2 to 6, and small paired anteapical spots on the ventral margin of 3 to 6.

Venation, based on 100 ♂ front and hind wings and 14 ♀ front and hind wings (50 ♂ and 7 ♀ specimens).

Three New North American Species of *Gomphinae* 13

	♂		♀		Same in both	
	Front wing	Hind wing	Front wing	Hind wing	front wings	hind wings
Triangle:						
1 celled	0	3	0	0		1 ♂
2 celled	29	85*	5	13*	11 ♂ 2 ♀	39* ♂ 6 ♀
3 celled	70*	11	9*	1*	31* ♂ 4* ♀	3 ♂
wing abnormal .	1	0	0	0		
wing missing ..	0	1	0	0		
Internal Triangle:						
1 celled	8	100*	3	14*	2 ♂ 1 ♀	50* ♂ 7* ♀
2 celled	90*	0	11*	0	42* ♂ 5* ♀	
3 celled	2	0	0	0		
Supra-triangle:						
0 crossvein	2	1	1	0		
1 crossvein	95*	96*	11*	14*	45* ♂ 4* ♀	47* ♂ 7* ♀
2 crossveins ...	3	2	2	0		1 ♂
wing missing ..	0	1	0	0		

* Includes type ♂ and allotype ♀.

Antenodal crossveins, front wing, ♂ and ♀, 17-23, type 20, allotype 23, average ♂ 19.58, ♀ 20.78; hind wing, ♂ 12-17, type 15-14, ♀ 14-17, allotype 17, average ♂ 14.81, ♀ 15.71. Postnodal crossveins, front wing, ♂ 9-14, type 13, ♀ 11-13, allotype 13-12, average ♂ 11.14, ♀ 12.15; hind wing, ♂ 10-15, type 13, ♀ 11-15, allotype 14-13, average ♂ 12.14, ♀ 13. Number of cells between Cu_1 and lower margin of hind wing, 5, ♂ 8, ♀ 12 wings; 4 and 6, ♂ 1 wing; 4 and 5, ♂ 10 wings; 4, ♂ 76, ♀ 2 wings; 3 and 4, ♂ 3 wings; 3, ♂ 1 wing; type ♂ 4 and allotype ♀ 5.

Measurements in millimeters. Abdomen (including appendages), ♂ 52-61.5, type 55.2, average 54.39; ♀ 52-55, allotype 54, average 53.58. Superior appendages, ♂ 2.6-3.0, type 2.9, average 2.87; ♀ 1.2-1.8, allotype 1.8, average 1.63. Hind wing, ♂ 37-43, type 40.7, average 39.96; ♀ 41-43, allotype 42, average 41.78. Pterostigma, front wing, ♂ 5.1-6.1, type 5.3, average 5.57; ♀ 5.5-6.0, allotype 5.6, average 5.73; hind wing

♂ 5.3–6.2, type 5.6, average 5.71; ♀ 5.7–6.0, allotype 5.8, average 5.86.

NYMPH.—The nymph was first described by Hagen in 1885 under the name of *Aphylla producta*. In 1930 it was re-described and credited to *Negomphoides ambigua* by Byers who gives an account of its habits and habitat in considerable detail (pp. 47–48, 244–247, Pl. VII, Fig. 107). It is also figured by Needham and Heywood (1929: 60, Fig. 26: 2, 2a) as an “unknown Gomphine from Florida.”

Material examined (all from Florida): Alachua County: May 28, 1928, 3 nymphs (University of Michigan²); Newmans Lake, Gainesville, May 23, 1929, 2 ♂ reared by C. F. Byers (Byers Collection); Wauberg Lake, 8.6 miles south of Gainesville, June 24, 1935, 1 ♂, I. J. Cantrall (University of Michigan). Dade County: Royal Palm Park, June 22, 1934, 1 ♂, June 26, 1925, 1 ♂, Carsten C. Ahrens (Kennedy Collection); June 10, 1930, 1 ♂, C. F. Byers (Byers Collection). Gadsden County: Near Chattahoochee, Mosquito Creek Pond above dam, August 25, 1932 (field No. 426) 4 ♂, August 26, 1932 (field No. 430) 7 ♂ 1 ♀, E. B. Williamson *et al.*³ (University of Michigan). Lake County: 3.3 miles south of Tavares, June 26, 1935, 1 ♂, I. J. Cantrall (University of Michigan). Madison County: Logan Lake, September 3, 1932 (field No. 454) 18 ♂ 2 ♀, September 4, 1932 (field No. 459) 4 ♂ 2 ♀ (allotype ♀), September 7, 1932 (field No. 464) 9 ♂ 1 ♀ (type ♂), E. B. Williamson *et al.* (University of Michigan). No definite locality, 1 ♂ 1 ♀, [H. K.] Morrison (Ris Collection in the Senckenberg Museum, Frankfurt a. M., Germany).

Additional locality records for the species are: Crescent City, Florida (Hagen 1885: 277) and Orange County (? , Gotha ?), Florida (Needham 1897: 184).

Gomphoides williamsoni taken by members of the Williamson-Ditzler expedition was found only on rather large lakes.

² The material in the University of Michigan is in the Williamson Odonata Collection of the Division of Insects, Museum of Zoology.

³ Williamson-Ditzler Expedition. Members of the party at the time were the late Mr. E. B. Williamson, Mr. and Mrs. W. H. Ditzler, Miss Laura Ditzler, Mr. Mark J. Decker, and the author.

Mosquito Creek (field Nos. 426 and 430), a mile east of Chattahoochee, above the power house dam forms a lake about a mile in length and a fourth of a mile wide. The shore line is irregular with many small islands separated from it by shallow water. The fringe of vegetation is principally of small cypress trees, willows, smartweed, tall grasses, and many button bushes. The *Gomphoides* rested most frequently on the latter, although all suitable perches were used. Logan Lake (Nos. 454, 459, and 464) in Madison County covers an area of approximately 100 acres, is open, and for the most part is surrounded by a narrow belt of cypress. The shallow water shelf of sand and coarse gravel varies in width from about 2 to 20 feet and usually supports a rather heavy growth of aquatic and semi-aquatic plants.

At both lakes *williamsoni* was shy, restless, and rapid in flight, especially when the sun was bright and warm. Individuals were so difficult to catch with a net that in order to obtain a large series it was necessary to shoot them. Twenty-two of the 48 specimens were obtained in this manner. They were most frequently seen flying 3 or 4 feet above the shallow water vegetation. When approached they retreated to the deep water region, and when disturbed or slightly injured they dashed to the highest tree tops and disappeared from sight. At sunset (No. 459) and until dark they flew lower and less rapidly, hovering much of the time.

The lakes where Mr. Cantrall collected *williamsoni* are also large ones but with a slightly different ecological situation. Wauberg Lake was fringed with water oak and elderberry. The shore was muddy with high grass to the water's edge where *Peltandra* grew. The shallow water vegetation was largely of water hyacinth. The lake near Tavares in Lake County was in a sandy region and surrounded by a turkey oak woods interspersed with a few long leaf pine and with an undergrowth of gall-berry and scattered wire grass. *G. williamsoni* was fairly abundant at both lakes.

Because of geographical proximity, nymphs of the Florida species were provisionally credited as belonging to the Cuban

producta by Hagen (1885). Byers (1930) determined the species as *Negomphoides ambigua*, basing his conclusion principally from a study of reared specimens. The present series of mature adult specimens with the color pattern fully developed shows that it is quite distinct from *ambigua* and *producta*. The known distribution of these species would indicate that *williamsoni* is more remote geographically from *ambigua* of Guatemala than from the *producta* of Cuba.

Gomphoides williamsoni belongs to the group of species having the spur- or prong-like first hamules. The hamules and the venation for the group show little variation so that slight but distinct differences in the shape and proportion of the superior appendages and the color pattern must be relied upon almost entirely for definition of the species. As noted, an adequate discussion of relationships is not now possible, and a comparison is therefore limited to the species with which *williamsoni* has been confused.

The following notes are based upon type descriptions (Selys 1854: 79 and 1873: 505) and specimens in the Williamson Collection. The *G. ambigua*, determined by Dr. Philip P. Calvert, is from Guatemala and may be considered as representing the species as recorded and figured in the *Biologia Centrali-Americana* (Calvert, 1901-1908: 157, Pl. 7, Figs. 18-19). Only Cuban specimens of *G. producta* are here considered.

In *ambigua*: Labium pale, the margin yellowish. Dorsal mesepisternal pale stripe straight, narrow, does not touch the mesothoracic half-collar below but reaches to the antelar carina above [“(ne touchant ni collier ni les sinus)” according to the original description]. Antehumeral pale stripe complete, slightly narrower than the mesepisternal. The three lateral pale stripes relatively broad and of subuniform width; the mesepimeral at mid-length about twice as wide as the antehumeral. Abdominal black markings distinct on dorsum of segments 8 and 9; lateral dilations of 8 and 9 distinct, 3 times as wide on 8 in apical third as on 9; segment 10 wider than long.

In *producta*: Labium broadly marked with dark brown at base. Dorsal mesepisternal pale stripe is not joined to the mesothoracic half-collar below but touches the antealar carina above. Antehumeral pale stripe very narrow and obscure. Lateral thoracic pale stripes not of uniform width; the metepisternal obsolete in the lower half and represented in upper half by a diffuse stripe or a narrow line terminating near the alar carina in a small round spot; the mes- and metepimeral narrow, the latter at mid-length of about the same width as the dorsal mesepisternal stripe. Abdominal black markings on dorsum of segments 8 and 9 well defined; lateral dilations of 8 and 9 narrow, about twice as wide on 8 as on 9; segment 10 slightly longer than wide.

In *williamsoni*: Labium entirely pale except for a very fine marginal line of pale yellowish brown and a narrow darker line across the base. Dorsal mesepisternal pale stripe usually broadly joined to the mesothoracic half-collar. Antehumeral pale stripe almost obsolete. Lateral thoracic pale stripes not of approximately uniform width; the metepisternal stripe about half as wide as either the mes- or metepimeral; metepimeral broad ($1\frac{1}{2}$ times as wide as in *ambigua*), almost twice as wide as the dorsal mesepisternal stripe. The abdomen has no distinct black markings on segments 8 and 9; lateral dilations of 8 and 9 conspicuous, 3 times as wide on 8 as on 9, about the same width as in *ambigua* but more gradually widened from the base of the segment; segment 10 distinctly longer than wide.

Although the appendages are similar and exhibit only minor differences, the general appearance of all 3 species is quite different. *G. williamsoni* is larger and more robust than either of the others.

With feelings of sincere admiration and respect and in due appreciation of his intense interest in the genus *Gomphoides* and in a form which he took so much joy in collecting on his last field trip, I name this species in honor of Mr. E. B. Williamson.

The above description is more or less a fulfilment of the intention of Mr. Williamson, who had made a preliminary

study of the specimens reared by Dr. Byers and of those taken by the Williamson-Ditzler expedition.

I wish to acknowledge the kindness of Dr. Philip P. Calvert in examining some of the material and of Dr. C. H. Kennedy in allowing me to include the Dade County specimens, which he had independently determined as representing an undescribed species.

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Leonora K. Gloyd

PLATE I

GOMPHUS ROGERSI, TYPE MALE

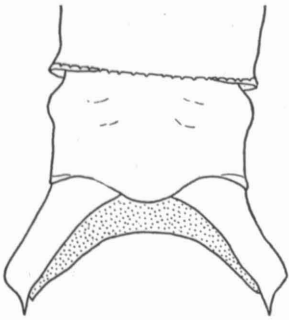
FIGS. 1-3. Abdominal appendages in dorsal, ventral, and lateral views, respectively.

FIG. 4. Genitalia of the second abdominal segment.

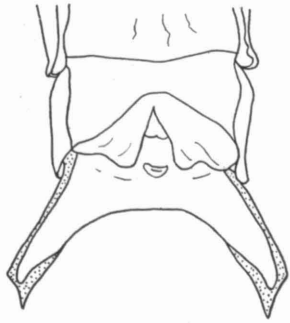
FIG. 5. Color pattern of the face and top of the head.

FIG. 6. Diagram of the thoracic color pattern showing the dorsum and one side only.

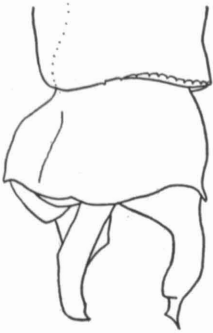
All drawings have been made with the aid of a camera lucida.



1



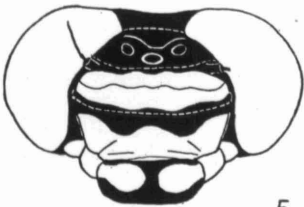
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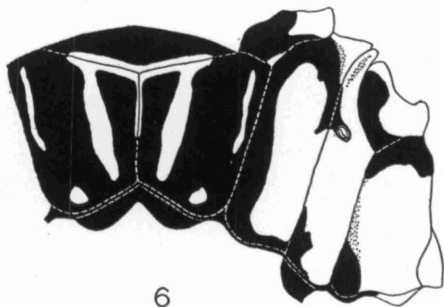
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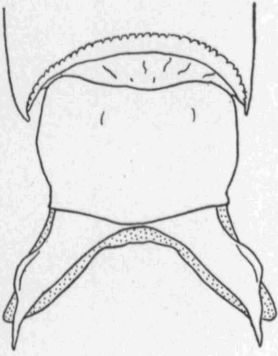
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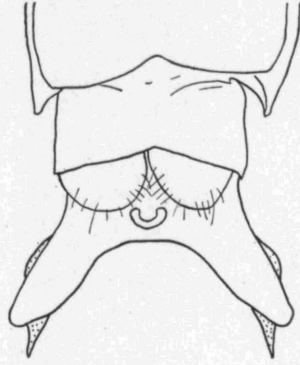
PLATE II

STYLURUS TOWNESI, TYPE MALE

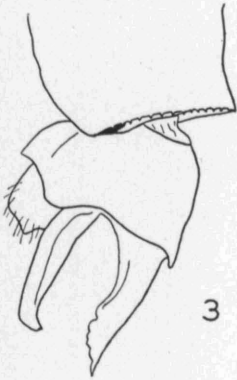
- FIGS. 1-3. Abdominal appendages in dorsal, ventral, and lateral views, respectively.
- FIG. 4. Genitalia of the second abdominal segment.
- FIG. 5. Color pattern of the face and top of the head.
- FIG. 6. Diagram of the thoracic color pattern showing the dorsum and one side only.



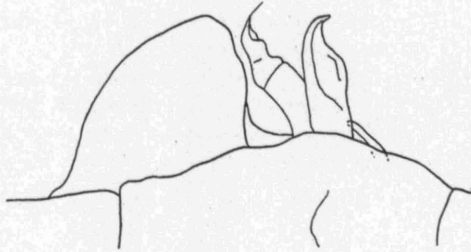
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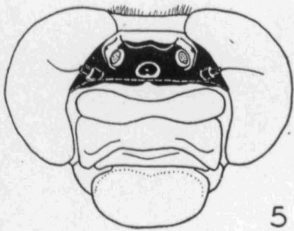
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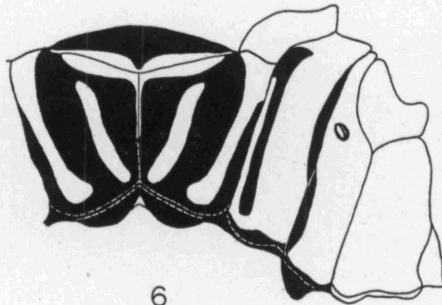
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6

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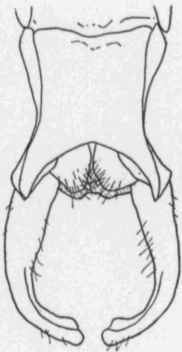
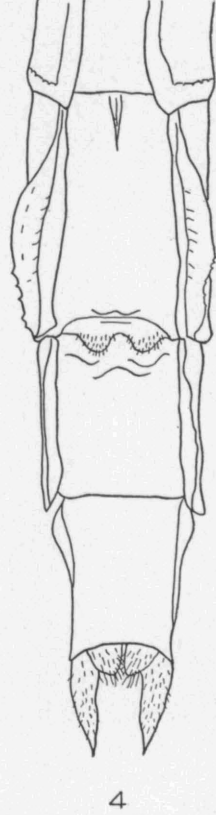
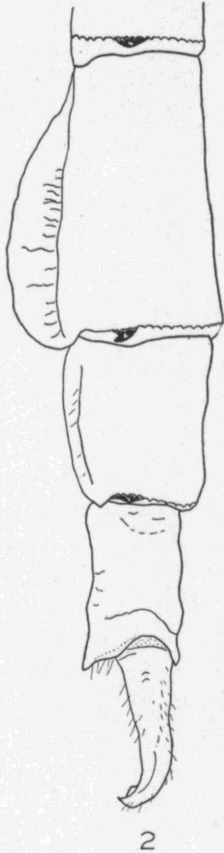
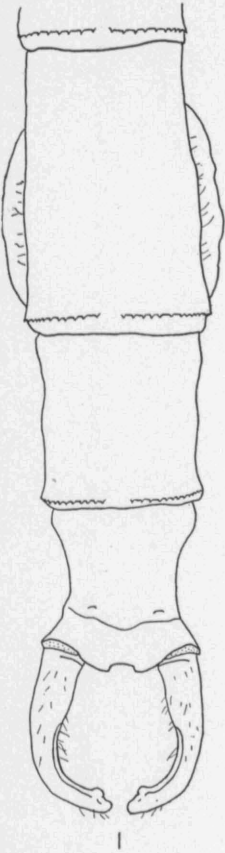
PLATE III

GOMPHOIDES WILLIAMSONI, TYPE MALE AND ALLOTYPE FEMALE

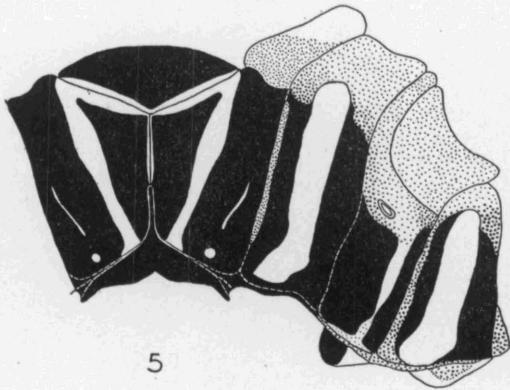
FIGS. 1-3. Abdominal appendages of the male in dorsal, ventral, and lateral views, respectively; Figs. 1-2 include segments 8-10 to show the extent of the lateral dilation.

FIG. 4. Ventral view of abdominal segments 8-10 of the female.

FIG. 5. Diagram of the thoracic color pattern of the type male. The black areas represent two tones of dark brown; the stippled areas, a golden or light brown; and the white areas, greenish yellow.



3



5

