

**TWO NEW GOMPHINE SPECIES FROM PARAGUAY
(ANISOPTERA: GOMPHIDAE)**

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Gomphoides cassiopeia sp. n. (♂ holotype, ♀ allotype: San Pedro, Arroyo Aguaray-mi, Lima) and *Progomphus flinti* sp. n. (♂ holotype: Amambay, Arroyo Guavira, Cerro Cora) are described and illustrated. The former is structurally near to *G. andromeda* (Sel.), while the latter is closely related to *P. geijskesi* Needham and *P. pijpersi* Belle.

INTRODUCTION

This account deals with two undescribed gomphine species collected in Paraguay by Dr. Oliver S. Flint, Jr. during his most successful Odonata collecting trip in Argentina and Paraguay (1973-1974). The types are in the National Museum of Natural History, Washington D.C.

GOMPHOIDES CASSIOPEIA SPEC. NOV.

Figures 1-7

Material. — P a r a g u a y : San Pedro, Arroyo Aguaray-mi, north of Lima, 1.XII.1973, 1 ♂, 1 ♀ (holotype and allotype, respectively), leg. Dr. O.S. Flint, Jr. (Type No. 73488).

The nearest relative of this species is *Gomphoides andromeda* (Selys, 1869) but it is much larger and stouter with well-developed exfoliations on the eighth and ninth abdominal segments in both sexes.

Male (holotype; head broken off; abdomen broken between segments 3 and 4). — Total length 58 mm; abdomen 44 mm; hind wing 34 mm; costal edge

of pterostigma in fore wing 4.7 mm.

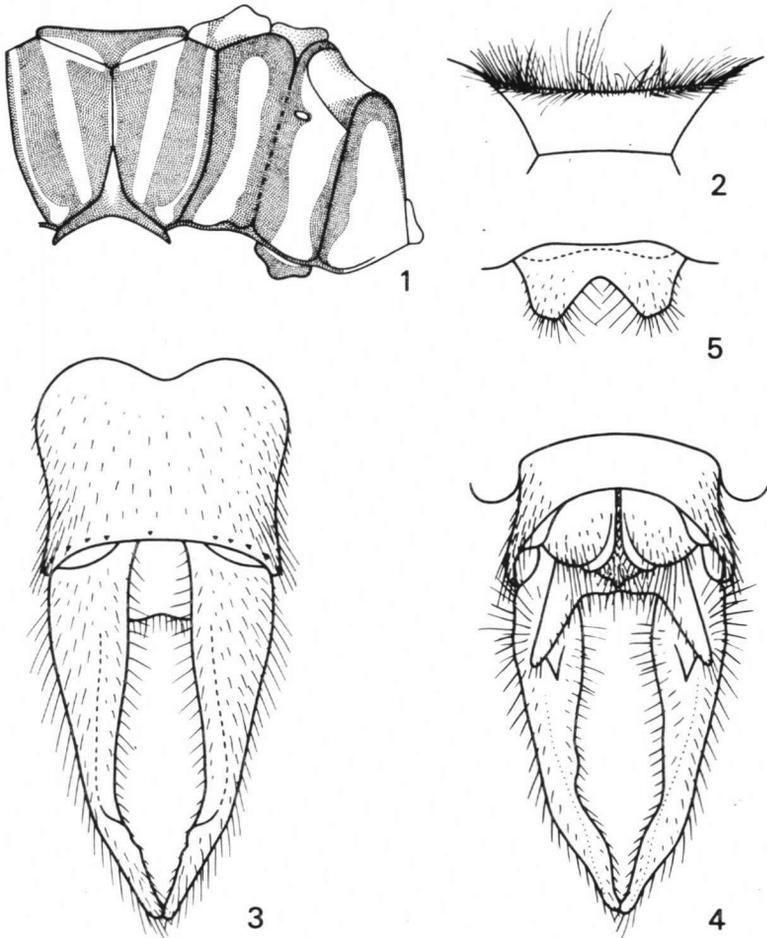
Face green but labrum with black band along free border. Base of mandibles green. Superior surface of frons green on anterior half, black on posterior half. Face and frons with rather long, brown and pale-brown hairs. Vertex black but concave area between and behind lateral ocelli green. Occipital plate largely green, lateral borders black. Posterior margin of occipital plate almost straight and fringed with rather long, pale-brown hairs. Rear of head black but green behind occipital plate. Labium and adjacent mouth parts green but labium with black band along free border.

Prothorax black, with very small green twin-spot on middorsum and green spot on each side. Pterothorax black with green stripes. Middorsal carina green. First pale antehumeral stripes almost parallel-sided, united with pale area of collar. Second pale antehumeral stripes well-developed. Three well-developed pale lateral stripes, the metepimeral stripe much wider.

Outer side of third pair of femora with well-developed yellow stripes for nearly entire length of femora. Outer side of second pair of femora with a single yellow stripe. Inner side of first pair of femora yellowish green. Tibiae and claws black but knee-caps (joints between femora and tibiae) yellow. Lamina tibialis of first pair of tibiae about a quarter the tibial length.

Wings hyaline, lightly tinged brown on extreme base. Venation of wings brown but R+M darker and frontal margin of costa bright yellow. Pterostigma blackish brown, surmounting $6\frac{1}{2}$ - 7 cells. Basal subcostal cross-vein present. Antenodal and postnodal cross-veins of first series 13:21-21:13/13:17-16:14 in fore and hind wings, respectively. Second primary antenodal cross-vein the sixth in right wings, the seventh in left wings. Intermedian cross-veins 12-11/8-9 in fore and hind wings, respectively. Supratriangle in right hind wing two-celled, in other wings three-celled. Triangle in left fore wing four-celled, in right fore wing three-celled, in hind wings three-celled with the cross-veins tri-radiate from centre. Subtriangle in fore wings three-celled with the cross-veins parallel, in hind wings two-celled. Trigonal interspace starting with four (left hind wing) or three (other wings) cells against triangle followed by two rows of cells. Hind wings with five paranal cells, six postanal cells, a two-celled anal loop, a four-celled anal triangle, and area posterior to Cu2 five to six cells wide.

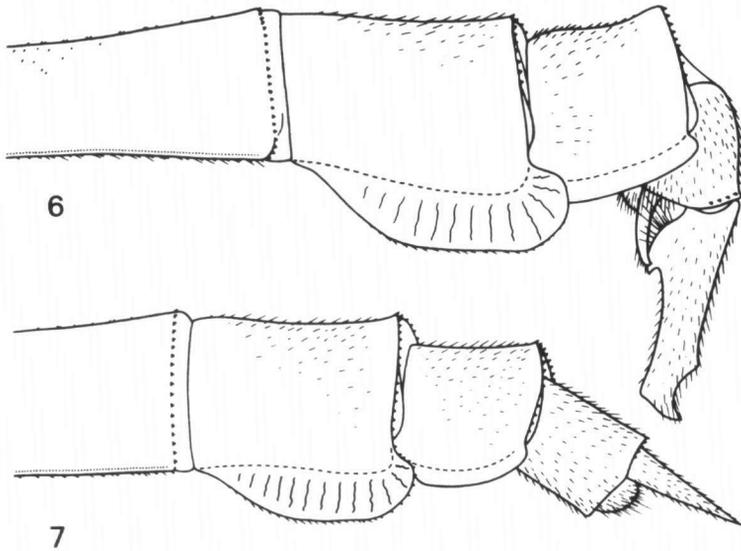
Abdomen black with green and yellow markings. Segment 1 with green sides and hind dorsal margin. Green sides of segment 2 with median, transverse black stripe. Auricles green. Middorsum of segment 2 with elongated triangular, green basal spot. Accessory genitalia black, similar to those of *Gomphoides andromeda*, the anterior hamules slightly different in conformation. Segment 3 to 6 green on basal third. Segment 7 green on basal half. Segment 8 green on basal third including lateral dilatations but except middorsum. Lateral dilatations of segments 8 and 9 otherwise black, and well-developed. Sides of segment 8 yellow on apical two-thirds. Sides of segment 9 with large yellow marking. Dorsum of



Figs. 1-5. *Gomphoides cassiopeia* sp. n.: (1) diagram of pterothorax of holotype male; – (2) occipital plate of holotype male; – (3) tenth abdominal segment and caudal appendages of holotype male, dorsal view; (4) the same, ventral view; – (5) vulvar lamina of allotype female, ventral view.

segment 10 largely green but basal and apical border black. Venter of segment 10 black. Dorsal posterior margin of segment 10 denticulated at level of base of superior caudal appendages. These appendages largely yellow, black at base, below black to beyond inferior tooth. In dorsal view each appendage almost straight, the distal third slightly curved inward. Inferior caudal appendage black, forked, the slender branches widely separated and divergent.

F e m a l e (allotype; tip of left fore wing deformed; abdomen broken



Figs. 6-7. *Gomphoides cassiopeia* sp. n.: (6) left lateral view of apical segments of abdomen and caudal appendages, holotype male; – (7) the same, allotype female.

between segments 4 and 5). – Total length 57 mm; abdomen 43 mm; hind wing 34 mm; costal edge of pterostigma in fore wing 5.0 mm.

Very much resembling holotype male in stature and coloration. The slight colour differences which are noteworthy are: Black band along free border of labium narrower; middorsal twin-spot of prothorax better developed; first pale antehumeral stripes not united with pale area of collar; green side of abdominal segment 2 without median, transverse black stripe; apical half of abdominal segment 7 green along ventral tergal margins; abdominal segment 10 with a green spot on middorsum and on each side; caudal appendages black on inferior side of extreme base only, acute point black.

Relative lengths of abdominal segments 7, 8, 9, and 10 about as 35:20:12:10, with the caudal appendages 11 on the same scale. Vulvar lamina about one-third the length of ninth sternum, its posterior margin widely excised V-shaped for two-thirds the length of lamina.

Antenodal and postnodal cross-veins of first series 11:18-21:11/12:14-14:11 in fore and hind wings, respectively. Second primary antenodal cross-vein the sixth. Intermedian cross-veins 10-11/6-7 in fore and hind wings, respectively. Supratriangle in left fore wing and right hind wing two-celled, in other wings three-celled. Triangles three-celled, the cross-veins tri-radiate from centre. Subtriangle in fore wings three-celled, the cross-veins parallel, in hind wings two-celled. Hind wings with five paranal cells, five postanal cells, a two-celled anal

loop (anal loop on right hind wing not distinct), two rows of cells in second anal interspace, and area posterior to Cu2 four to five cells wide.

PROGOMPHUS FLINTI SPEC. NOV.

Figures 8-11

Material. — *P a r a g u a y* : Amambay, Arroyo Guavira, rt. 5, 10 km west of Cerro Cora, 28-29.XI.1973, 2 ♂ (holotype and paratype), leg. Dr. O.S. Flint, Jr. (Type No. 73489).

This species is most closely related to *Progomphus geijskesi* Needham, 1944 and *Progomphus pijpersi* Belle, 1966 but more to the first than to the second one, and readily distinguished from both by differences in the colour design of the pterothorax and the conformation of the male caudal appendages.

M a l e (holotype). — Total length 37 mm; abdomen 28.5 mm; hind wing 20 mm; costal edge of pterostigma in fore wing 3.0 mm.

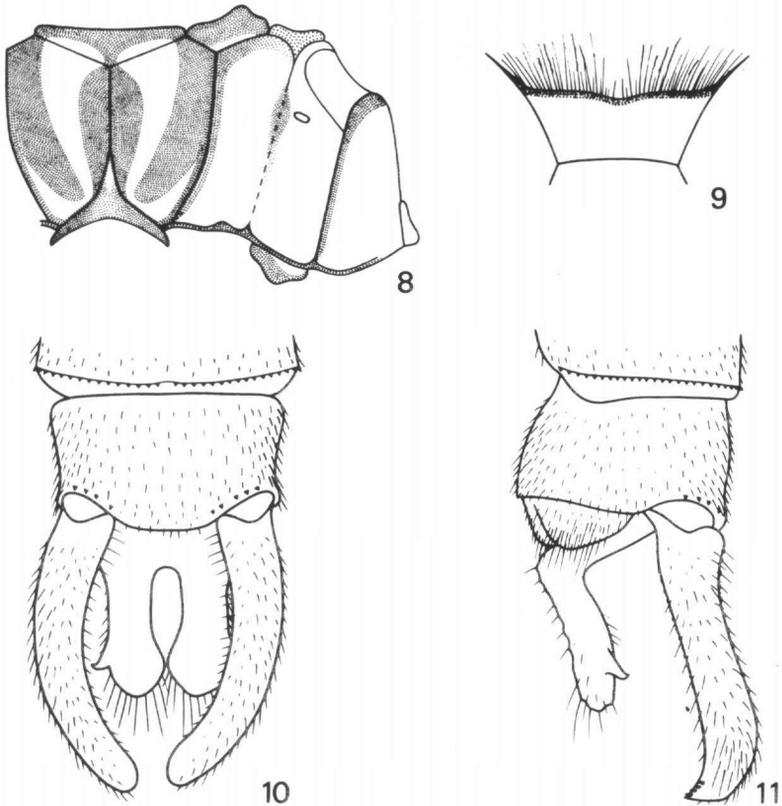
Face brown. Base of mandibles somewhat green. Superior surface of frons green, its extreme base blackish brown. Vertex and occipital plate dark brown. Posterior margin of occipital plate with shallow median excision and fringed with rather long hairs. Rear of head black. Labium and adjacent mouth parts pale brownish yellow.

Prothorax dark brown. Pterothorax dark brown with green markings, the green on dorsum lighter. First pale antehumeral stripes united broadly with pale area of collar, the upper part wedge-shaped and tapering, produced along antearlar sinus and connected with second pale antehumeral stripe which is developed on upper half of dorsum only. Sides largely green, dark interpleural stripe ill-defined, dark metapleural stripe weakly developed.

Femora dark brown on outer sides, the inner sides lighter, that of first pair of femora somewhat green. Tibiae and claws black. Lamina tibialis of first pair of tibiae one-fifth the tibial length.

Wings hyaline. Venation of wings dark brown but frontal margin of costa with inconspicuous yellow line. Pterostigma dark brown, surmounting 4 - 5½ cells. Basal subcostal cross-vein present. Antenodal and postnodal cross-veins of first series 7:11-11:7/8:10-9:8 in fore and hind wings, respectively. Second primary antenodal cross-vein the fourth in fore wings, the fifth in hind wings. Intermedian cross-veins 5-4/4-3 in fore and hind wings, respectively. Supra-triangles open. Subtriangle in left fore wing two-celled, in other wings open. Triangles open. Trigonal interspaces starting with two rows of cells from triangle outward. Fore wings with a single row of cells in anal field and posterior to Cu2. Hind wings with five paranal cells, three (left) and two (right) postanal cells, a three-celled anal triangle, and two rows of cells posterior to Cu2.

Abdomen predominantly black. Segment 1 with green sides, venter with



Figs. 8-11. *Progomphus flinti* sp. n., holotype male: (8) diagram of pterothorax; - (9) occipital plate; - (10) tenth abdominal segment and caudal appendages, dorsal view; - (11) the same, left lateral view.

median, anterior, transverse fold which is densely covered with spine-like hairs. Segment 2 with green sides and yellow middorsal stripe. Accessory genitalia very much resembling those of *Progomphus geijskesi* but tip of anterior hamules less deeply and widely excised than in that species. Hamules brown, the tips black. Hood of penial peduncle black. Segment 3 to 7 with middorsal yellow basal spot which is produced rearward to a middorsal stripe or line that is very fine on segments 5 and 6; pale basal spots on segments 3 to 6 triangular, on segment 7 subquadrangular. Sides of segment 8 with yellowish brown basal spot. Caudal appendages dark brown. Superior caudal appendages somewhat stouter and more strongly curved inward than in *P. geijskesi*. Extreme tip of these appendages with an inferior row of five denticles, a characteristic also found in *P. pijpersi*.

F e m a l e unknown.

The paratype male has a distinct green spot on each side of the dorsum of the prothorax. The triangle in all wings and the subtriangle in the fore wings are two-celled. The subtriangle in the hind wings is open as in the holotype. The trigonal interspace in the left hind wing starts with a row of three cells against the triangle.

The three species *Progomphus geijskesi*, *P. pijpersi*, and *P. flinti* are forming a distinct group, the *geijskesi*-group, within the genus. The range of these apparently border-line members of the genus is the Amazon area and its fringe areas.

The new species of *Progomphus* has been named in honor of the collector Dr. OLIVER S. FLINT, Jr., whose excellent work in the field has enriched our knowledge of the Odonata fauna in many ways.

REFERENCES

- BELLE, J., 1966. Surinam dragon-flies of the genus *Progomphus*. *Stud. Fauna Suriname* 8: 1-28, figs. 1-50, pls. 1-4.
- BELLE, J., 1970. Studies on South American Gomphidae (Odonata) with special reference to the species from Surinam. *Stud. Fauna Suriname* 11: 1-158, figs. 1-264, pls. 1-21.
- BELLE, J., 1973. A revision of the New World genus *Progomphus* Selys, 1854 (Anisoptera: Gomphidae). *Odonatologica* 2 (4): 191-308, figs. 1-336, tabs. 1-2.
- CALVERT, P.P., 1948. Odonata (dragonflies) of Kartabo, Bartica District, British Guiana. *Zoologica, N. Y.* 33: 47-87, pls. 1-2.
- NEEDHAM, J.G., 1944. Further studies of Neotropical gomphine dragonflies. *Trans. Am. Ent. Soc.* 69: 171-224, pls. 14-16.
- SELYS LONGCHAMPS, E. de, 1869. Secondes additions au synopsis des Gomphines. *Bull. Acad. Belg.* (2) 28: 168-208 (5-45 sep.).
- ST. QUENTIN, D., 1973. Die Gomphidenfauna Südamerikas. *Annln naturh. Mus. Wien* 77: 335-363, figs. 1-14.