On five species of *Progomphus* Selys from Brazil with the descriptions of four new taxa (Odonata: Gomphidae)

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The species *P. angeloi* spec. nov. (♂ holotype: State of Amazonas, Tefé), *P. basalis* spec. nov. (♂ holotype: State of Minas Gerais, Porto Cabral), *P. bidentatus* spec. nov. (♂ holotype: State of São Paulo, Lins), *P. microcephalus* spec. nov. (♂ holotype: probably south-eastern part of Brazil) and the hitherto unknown female of *P. nigellus* Belle are described and illustrated. A key to the Brazilian species of *Progomphus* is added.

Introduction

The present paper deals with five species of *Progomphus* from Brazil. The material originates from three sources. First of all three undescribed species, each represented by a single male, were detected in the Odonata collection of the Museu Nacional at Rio de Janeiro. They were loaned generously to me by Prof. Dr Janira Martin Costa during my visit in 1992. Another new species, represented by a male and a female, I found in a consignment of Gomphidae kindly sent to me by Prof. Dr Angelo B.M. Machado, Belo Horizonte. And finally the hitherto undescribed female of *P. nigellus* Belle, 1990, I received from Prof. Dr Minter J. Westfall Jr, Gainesville. For the privilege of studying, describing and publishing the present material I am very thankfull to these three colleagues.

The new taxa here described as *Progomphus angeloi*, *P. basalis*, *P. bidentatus* and *P. microcephalus* bring the total number of *Progomphus* species up to 67, and those known from Brazil to 28. The new descriptions shows that the genus *Progomphus* is much richer in species than it was supposed to be after its latest revision (Belle, 1973). Since 1973 14 new species, including the present ones, have been discovered, and I am convinced that still more are to be discovered. Several of the females of *Progomphus* seen, I consider to belong to undescribed species. A key to the Brazilian species of *Progomphus* has been added to the end of this paper.

The terminology of wing venation used in this paper is that of Comstock-Needham. The figures of the thoracic colour pattern are diagrammatic. All other illustrations are reproductions of original camera lucida drawings (details completed by free hand). FSCA stands for Florida State Collection of Arthropods, Gainesville, MNRJ for Museu Nacional, Rio de Janeiro, and RMNH for Nationaal Natuurhistorisch Museum, Leiden.

Progomphus angeloi spec. nov.
(figs. 1-6)

Material.— Holotype, ♂ (Machado collection, Belo Horizonte), "Brazil: State of Amazonas, Tefé (Amazon River), iv.1962, Carvalho leg.". Paratype: 1 ♀ (allotype), topotypic and same date.

This new species is closely related to *P. nigellus* Belle, but it is a smaller and a more delicate species. The most striking morphological difference are found in the male cerci. These are much shorter and extend rearward only a little beyond the branches of the epiproct. Other remarkable differences are the pale terminal end of the male cerci, the almost straight occipital ridge and the less denser venation of the wings. The corresponding female is somewhat larger than the male.

Male (holotype; abdomen broken between segments 5-6).— Total length 34 mm; abdomen 26 mm (incl. app. 1.4 mm); hind wing 20 mm; costal edge of pterostigma in fore wing 2.8 mm.

Head.— Face dark brown with pale (= greyish-green) genae, free border of labrum, anteclypeus, facial lobes of postclypeus and vertical part of frons. Superior surface of frons dark brown at base and with a broad pale anterior band that is constricted in middle. Vertex dark brown. Occipital plate brown, the posterior ridge straight (fig. 5). Rear of head dark brown with laterally a small round yellow spot and a lower yellow band below compound eye. Labium and adjacent mouth parts pale with brown anterior edges.

Thorax.— Prothorax dark brown with a pale spot on each side of middle lobe. Pterothorax dark brown with pale stripes, its colour pattern resembling that of *P. nigellus* but first pale antehumeral stripes narrower and there are no pale dorsal juxta-humeral spots (fig. 1).

Legs.— Femora dark brown with pale inner sides. Tibiae, tarsi and claws very dark brown, almost black. Hind tarsus about as long as hind tibia.

Wings.— Hyaline. Venation dark brown but frontal margin of costa with an inconspicuous yellow line that is interrupted by numerous black dots. Pterostigma brown. Basal subcostal cross-vein present. Nodal index 9:13-15:8/9:11-10:7. Second primary antenodal cross-vein the fifth. Intermedian cross-veins 6-6/4-4 in fore and hind wings, respectively. Discoidal triangles in left pair of wings three-celled with the dividing cross-veins tri-radiate from the centre. Discoidal triangles of right pair of wings and subtriangles in all wings two-celled. Supratriangle in left fore wing traversed by a cross-vein, in other wings entire. Anal field in right fore wing one cell wide but that in left fore wing with a double cell. Area in hind wing posterior to Cu2 two cells wide with an extra cell for a third row in distal part. Three postanal cells. Second anal interspace starting, at anal vein, with a single row of cells, two cells long. Male anal triangle three-celled.

Abdomen.— Predominantly dark brown, the dark colour almost black on apical segments, marked with pale (= greyish-green on basal segments, yellow on other segments) as follows: segment 1 largely pale on sides. Segment 2 pale on proximal half of dorsum, on auricles, along ventral tergal margins and along posterior border of lateral sides. Segment 3 with a pale middorsal stripe. Segment 4 to 7 with a small pale basal spot each side. Segment 7 also pale along ventral tergal margins of widening apical half of segment. Segment 8 pale along ventral tergal margins, the pale marking widest in middle. Tip of cerci pale. Tip of each branch of epiproct with three blunt teeth along inner superior border. Caudal appendages shaped as shown in figures 2-4. Accessory genitalia very dark brown and shaped as in *P. nigellus*.

Female (allotype; abdomen broken between segments 4-5, 5-6 and 6-7).— Total length 35 mm; abdomen 26.5 mm (incl. app. 0.9 mm); hind wing 22 mm; costal edge of pterostigma in fore wing 3 mm. Colouration resembling that of male holotype but

vertical part of frons dark brown for its lower half. Abdominal segments 2 and 3 with a pale middorsal line, segment 2 with a broad pale side spot extending from base to apex of segment, basal side spot of segment 3 extending to supplementary transverse carina, pale basal side spot on segments 5 to 7 small, segments 7 and 8 pale along ventral tergal margins, and stylets (anal appendages) pale on middle part of superior surface. Lengths of abdominal segments 7, 8, 9 and 10 approximately in ratio 31:20:13:10, with the stylets 9 on the same scale. Vulvar lamina shaped as shown in figure 6. Nodal index 10:15-14:10/10;12-11:10. Intermedian cross-veins 7-8/4-4. Discoidal triangle in right hind wing two-celled, in other wings three-celled with the dividing cross-veins tri-radiate from the centre. All wings with two-celled subtriangle and entire supratriangle. Hind wings with second anal interspace two cells wide, three postanal cells and three rows of cells behind Cu2.

I name this species in honour of my highly esteemed friend Prof. Dr Angelo B.M. Machado, who has generously sent to me - two decennia long - numerous Brazilian Gomphidae for identification and eventual description. Thanks to his continuous attention and field work a large part of the gomphid fauna of Brazil could be disclosed.

Progomphus basalis spec. nov.
(figs. 7-11)

Material.— Holotype, ♂ (MNRJ, No. 16902), "Brazil: State of Minas Gerais, Porto Calral, x.1941, Travanos leg.".

The wings of this species have a small brown basal spot. In this respect it resembles *Progomphus basistictus* Ris, 1911, but the caudal appendages are structurally quite different.

Male (holotype; broken in pieces and partly eaten out by tropical scavangers; fourth abdominal segment lost; tip of hind wings broken away).— Total length circa 39 mm; abdomen circa 30 mm (incl. app. 2.2 mm); hind wing circa 24 mm; fore wing 24 mm; costal edge of pterostigma in fore wing 3.2 mm.

Head.— Labrum grey with a narrow yellow band along free border. Anteclypeus grey. Postclypeus pale brown with grey facial lobes. Superior surface of frons pale brown with a yellow anterior band that is widely interrupted in middle. Vertex brown; postocellar ridges high and broadly swollen. Occipital plate pale brown, its posterior ridge straight (fig. 7) and fringed with pale brown hairs (although most of the hairs are broken away). Rear of head dark brown above, brown-yellow below. Labium and adjacent mouth parts pale brown.

Thorax.— Prothorax brown. Pterothorax brown with green stripes. Colour pattern largely disappeared owing to post mortem discolouration. Second pale antehumeral stripe complete. Mesepimeron largely pale.

Legs.— Femora brown, but inner side of first pair of femora green. Tibiae brown with brown-yellow outer side. Tarsi and claws brown-yellow. Hind tarsus about as long as hind tibia.

Wings.— Hyaline, with brown basal spot in antenodal and midbasal interspaces, the spots reaching to first primary antenodal cross-vein. Venation brown but frontal margin of costa yellow to near apex of pterostigma, the latter brown-yellow. Basal subcostal cross-vein present. Nodal index 6:12-12:5/7:9-9:6. Second primary antenodal cross-vein the fifth. Intermedian cross-veins 6-5/3-3. Supratriangles open.

Subtriangles and discoidal triangles two-celled. Anal field in fore wing two cells wide. Three to four rows of cells behind Cu2 of hind wing. Male anal triangle of hind wing three-celled.

Abdomen.— Almost hairless including caudal appendages. Colouration brown with yellow to brown-yellow markings as follows. Dorsum of segment 3 yellow for basal three-quarters, that of segments 5 and 6 for basal two-thirds, that of segment 7 for basal half. Segment 8 with yellow side spots. Segments 9 and 10 with yellow on sides and dorsum. Caudal appendages shaped as shown in figures 8-10. Cerci brown-yellow and with an acute basal externo-lateral tooth. Epiproct brown, the tip of the branches strongly curved inward and ending in two black denticles. Anal tubercles large and yellow. Posterior genital hamules stocky and almost hairless (fig. 11) but for the rest the accessory genitalia are of the usual type.

Progomphus bidentatus spec. nov.
(figs. 12-16)

Material.— Holotype, ♂ (MNRJ), "Brazil: State of São Paulo, Lins, 6.x.1985, N. Santos, L. Fernando & José Roberto leg.".

The male of this species is peculiar in having the inner apical lobe of the anterior genital hamules two-pronged, a character not yet encountered in *Progomphus*. Unfortunately, the present specimen is very teneral but it is well distinguishable by this character. The colours are weakly developed due to immaturity and the colour pattern is indefinite. In fully mature specimens the brownish or pale brown colours may be brown or dark brown and the other pale colours yellow, greenish-yellow or green.

Male (holotype; very teneral and shrivelled).— Total length circa 32 mm; abdomen circa 25 mm (incl. app. circa 1.2 mm); hind wing circa 21 mm; costal edge of pterostigma in fore wing 3.3 mm.

Head.— Face pale but labrum brownish. Superior surface of frons pale brown along base and with a broad pale frontal band that is much narrower in middle. Vertex and occipital plate brownish. Swollen ridge behind paired ocelli low. Occipital plate about four times as long transversely as it is wide middorsally, its posterior ridge almost straight and fringed with pale brown hairs. Rear of head brownish above, pale below. Labrum and adjacent mouth parts pale.

Thorax.— Prothorax brownish. Dorsum of pterothorax brown with indefinite pale markings but it would appear that the antehumeral stripes are connected with the pale mesothoracic "half collar". No pale second antehumeral stripes or dorsal juxta-humeral spots discernible. Sides of pterothorax largely pale with a brown band along humeral suture and probably with narrow brown midlateral (interpleural) and femoral (metapleural) stripes.

Legs.— Femora brownish, the inner side of first pair of femora pale. Tibiae, tarsi and claws brownish but darker than femora. Hind tarsus as long as hind tibia.

Wings.— Hyaline. Venation pale brown, the pterostigma paler. Basal subcostal cross-vein present. Nodal index 9:13-13:9/9:9-9:9. Second primary antenodal cross-vein the fifth. Intermedian cross-veins 5-5/4-4. Supratriangles open. Subtriangles and discoidal triangles two-celled. Male anal triangle in hind wing more or less isosceles, three-celled and less produced toward hind margin of wing than is normally the case in *Progomphus* males (fig. 12).

Abdomen.— Predominantly brownish including caudal appendages. The shrivelled caudal appendages shaped as shown in figs. 13-14. Inferior carina of cerci with a single row of about eight black denticles. Cerci with a basal externo-lateral dilatation which is subtriangular of form and ends in a black denticle. Branches of epiproct with an incurved and upcurved tip that ends in two black denticles, the supero-external tooth ends in one denticle. Genital hamules shaped as shown in figures 15-16. Tip of posterior hamule ending in a very acute black point.

Progomphus microcephalus spec. nov.
(figs. 17-22)

Material.— Holotype, ♂ (MNRJ, No. 24456), "Brazil: MF, 14.x.1963".

This new species belongs to the group of congeners without a basal subcostal cross-vein in the wings. It is perhaps as nearly related to *P. auropictus* Ris, 1911, as to *P. virginiae* Belle, 1973, but differs from both by the unusually low occiput, that suggests the specific name, and in having the sides of the pterothorax with undeveloped midlateral and femoral dark stripes.

Despite written inquiries I was unable to ascertain the exact place of capture of the holotype. It is not to say whether the initials MF are from the locality or from the collector. In all probability the species is from south-eastern part of Brazil since all known species without a basal subcostal cross-vein occur in that area and in the adjacent province of Misiones in Argentina (cf. Belle. 1973: 301, 302).

Male (holotype; somewhat teneral; abdomen broken between segments 3-4 and 5-6).— Total length 37 mm; abdomen 28 mm (incl. app. 1.5 mm); hind wing 24 mm; costal edge of pterostigma in fore wing 3.6 mm.

Head.— Face largely pale brown but genae, outer basal surface of mandibles, free border of labrum, and lateral lobes of postclypeus pale greenish. Superior surface of frons pale brown with greenish transverse band. Vertex pale brown, the ridge behind paired ocelli semicircular and inflated. Occipital plate very narrow (fig. 17), its posterior ridge slightly concave in middle and fringed with rather long brown hairs. Rear of head entirely brown yellow. Labium and adjacent mouth parts pale brown.

Thorax.— Middle lobe of prothorax largely brown-yellow and with a yellow median twin-spot. Fore and hind lobes of prothorax brown. Dark inter- and metapleural stripes undeveloped. First pale antehumeral stripes and pale mesothoracic "half collar" whitish-green and confluent. Colour scheme of pterothorax shaped as shown in fig. 21.

Legs.— Brown-yellow, the inner sides of tarsi brown, the tips of claws black. Hind tarsus two-thirds as long as hind tibia.

Wings.— Largely hyaline, but with a faint brown tinge in antenodal and postnodal interspaces. Venation brown. Pterostigma brown-yellow. No basal subcostal cross-vein. Nodal index 9:14-15:8/9:11-11:10. Second primary antenodal cross-vein the sixth in right hind wing, the fifth in other wings. Intermedian cross-veins 5-5/4-3. Supratriangles open. Subtriangle and discoidal triangle in fore wings open, in hind wings two-celled.

Abdomen.— Predominantly brown-yellow but all segments, except segment 10, with a broad brown longitudinal band on lateral sides. Caudal appendages also

brown-yellow, the denticles on inferior carina of cerci and on extreme tip of branches of epiproct black. Caudal appendages shaped as shown in figures 18-20. Cerci not regularly tapering to an acute point, the inferior carina of each cercus with 10 denticles, the row of denticles beginning at lower tip of basal externo-lateral dilatation. Incurving tip of branches of epiproct ending in two superior denticles, externo-lateral tooth of branches ending in a single superior denticle. Accessory genitalia with rather stout posterior hamule (fig. 22), but for the rest it is of the usual type.

Progomphus nigellus Belle, 1990
(fig. 23)

Material.— Brazil: 1 ♂ (RMNH), State of Rondônia, 12.5 km S of Cacaulandia, Linea 2 1/2 x B-65 (elev. 600 ft), 11 xi.1990, T.C. Emmel leg.; 1 ♀ (FSCA), 2 km N of Cacaulandia on B-65, Linea C-17 (dry trail), 16.xi.1991; 1 ♂ (FSCA), Fazenda Rancho Grande, 62 km S of Ariquemes, Linea C-20, 7 km E of B-65 (10°32'S 62°48'W, elev. 540 ft), 22.xi.1991, M.J. Westfall Jr.

The male collected November 22nd is somewhat smaller (hind wing 21 mm) than the one collected November 11th (hind wing 23 mm) and has no pale dorsal juxta-humeral spots. The hitherto unknown female is described below.

Female (head and left caudal appendage broken off).— Total length 34 mm; abdomen 25.5 mm; hind wing 23 mm; costal edge of pterostigma in fore wing 3 mm.

Very similar in stature and general dullness as male holotype. Thoracic colour pattern similar to holotype, but pale dorsal juxta-humeral spots smaller. Face, frons, vertex and occipital plate brown. Labrum with a broad pale band along free border. Border of facial lobes pale. Legs as in holotype with the tibiae, tarsi and claws black. Hind tibia as long as hind tarsi and claws together. Vulvar lamina shaped as shown in figure 23. Lengths of abdominal segments 7, 8, 9 and 10 approximately in ratio 31:9:6:5, with the stylets 5 on the same scale. Wings with brown tinge. Nodal index 11:14-14:12/12:11-11:13. Supratriangles open. Subtriangles and discoidal triangles two-celled except for discoidal triangle of right fore wing which is three-celled with the dividing cross-veins tri-radiate from the centre.

Remark.— Dr Rosser W. Garrison wrote from Azusa, 30 January 1992, that he had deposited the holotype of this species in the Museo Nacional, Rio de Janeiro, Brazil.

Key to the Brazilian species of *Progomphus*

Caution should be taken in using this key since the male of one species and the female of nine species are unknown. In taking into account intraspecific variations in the colouration (or possible discolouration) it has been necessary to key out two species at more than one point. At each couplet the number of the preceding one has been given so that the key can also be used backward. The term "usually" as here employed is in the sense of Byers, 1939 (footnote 4 on page 25).

1. Basal subcostal cross-vein absent 2
- Basal subcostal cross-vein usually present 7

2(1). A complete second pale antehumeral stripe present; sides of pterothorax pale with three brown stripes, the dark inter- and metapleural stripes often less developed or wanting. Epiproct of male brownish yellow or brown-yellow . 3
- Second pale antehumeral stripe absent or reduced to an antealar spot; sides of pterothorax brown with two pale stripes, the pale metepimeral stripe often less developed. Epiproct of male dark brown or blackish-brown 4

3(2). Occipital plate six times as long transversely as it is wide middorsally. Terminal end of branches of epiproct of male roundly expanded. (Female unknown) ..... ***P. virginiae*** Belle

\- Occipital plate ten times as long transversely as it is wide middorsally. Branches of epiproct of male slender at tip. (Female unknown)..... ***P. microcephalus*** spec. nov.

4(2). First pale antehumeral stripes in male broadly confluent with pale mesothoracic "half collar"; basal externo-lateral dilatation of male cerci conspicuously expanded. Vertex of female with a pair of slender postoceller horns 5

\- First pale antehumeral stripes in male confluent with pale mesothoracic "half collar" at outer end only; basal externo-lateral dilatation of male cerci not especially enlarged and pointed. Vertex of female without postocellar horns, the postocellar ridges sometimes with a lateral tubercle or twin-protuberance 6

5(4). Basal externo-lateral dilatation of male cerci reaching backward to a point half-way along branches of epiproct. Postocellar horns of female small ..... ***P. gracilis*** Hagen in Selys

\- Basal externo-lateral dilatation of male cerci reaching backward to superoexternal anteapical tooth of branch of epiproct. Postocellar horns of female long and reclined to beyond anterior margin of occipital plate ..... ***P. adaptatus*** Belle

6(4). Frons distinctly angled at frontal border, anterior ridge present. Posterior genital hamules of male with an extra internal subapical spine, this spine sometimes very small and inconspicuous. [Female with a conspicuous protuberance between each lateral ocellus and adjacent compound eye] ..... ***P. lepidus*** Ris

\- Frons not distinctly angled at frontal border and without anterior ridge. Posterior genital hamules of male without an extra internal subapical spine. (Female unknown) ..... ***P. elegans*** Belle

7(1). Wings with coloured frontal band, but sometimes weakly developed 8

\- Wings without coloured frontal band 10

8(7). Very small species: abdomen 19 mm, hind wing 14 mm. Subtriangles and discoidal triangles entire, trigonal interspaces with a single row of cells. [Branches of epiproct of male strongly incurved in their distal two-fifths. (Female unknown)] ..... ***P. perithemoides*** Belle

\- Larger species: abdomen > 24 mm, hind wing > 18 mm. Subtriangles and discoidal triangles usually crossed; trigonal interspaces with two rows of cells 9

9(8). Larger species; abdomen 35-37 mm, hind wing 28-30 mm. Male cerci acutely pointed. Dark midlateral stripe of pterothorax well developed. Posterior margin of vulvar lamina of female widely V-shaped excised in middle, and bottom of excision rounded ..... ***P. costalis*** Hagen in Selys

\- Smaller species; abdomen 29-34 mm, hind wing 22-25 mm. Male cerci bluntly pointed. Dark midlateral stripe reduced to a conspicuous pronounced dark area around and below spiracle. Posterior margin of vulvar lamina of female narrowly U-shaped excised in middle, and bottom of excision angled ..... ***P. aberrans*** Belle

10(7). Very small species: abdomen 18 mm, hind wing 14-15 mm. Hind tarsus distinctly longer than hind tibia. [Male caudal appendages slender, the cerci without a basal externo-lateral dilatation. (Female unknown)] ..... ***P. perpusillus*** Ris

\- Larger species. Hind tarsus as long as or shorter than hind tibia 11

11(10). Hind tarsus about two-thirds the length of hind tibia or shorter 12

\- Hind tarsus about three quarters the length of hind tibia or longer 16

12(11). Abdominal segment 1 with a mid-ventral bean-shaped tubercle or a conspicuous transverse welt-like fold, both densely covered with spine-like hairs. Male cerci more or less round in cross-section, without a basal externo-lateral dilatation and the usual denticulated inferior carina 13

\- Abdominal segment 1 without a mid-ventral process. Male cerci flattened beyond base and with a denticulated inferior carina 15

13(12). Abdominal segment 1 with a mid-ventral bean-shaped tubercle. Male cerci very regularly curving downward at distal end; in lateral view the branches of epiproct suddenly curving upward and rearward in an obtuse angle of about 120°. [Vulvar lamina of female one-third as long as ninth sternum, its posterior margin widely excised V-shaped in middle, and bottom of excision round] ..... ***P. pijpersi*** Belle

\- Abdominal segment 1 with a conspicuous transverse welt-like fold. Male cerci not regularly curving downward at apex; in lateral view branches of epiproct suddenly curving upward and rearward at a right angle 14

14(13). Discoidal triangles open. Male cerci with an inferior row of denticles at apex . ..... ***P. flinti*** Belle

\- Discoidal triangles two- or three-celled. Male cerci without an inferior row of denticles at apex. [Vulvar lamina one-fourth to one-fifth as long as ninth sternum, its posterior margin widely excised V-shaped in middle] ..... ***P. geijskesi*** Needham

15(12). Larger species: abdomen 39 mm; hind wing 26 mm. Anal field in fore wing two cells wide; frons high. Incurving tip of posterior genital hamules of male long and slender. (Female unknown) ..... ***P. amazonicus*** Belle

\- Smaller species: abdomen 22-28 mm; hind wing 18-24 mm. Anal field in fore wing one cell wide; frons low. Incurving tip of posterior genital hamules of male short and stout. [Posterior margin of vulvar lamina of female widely excised V-shaped in middle, bottom of excision rounded, and lateral sides of vulvar lamina prolonged rearward along ninth sternum] .... ***P. pygmaeus*** Selys

16(11). Labrum with distinct brown marking 17

\- Labrum without or with indefinite brown marking 24

17(16). First pale antehumeral stripes not reaching to and not jointed with mesothoracic "half collar" 18

\- First pale antehumeral stripes reaching to or jointed with pale mesothoracic "half collar" 22

18(17). Larger species: abdomen > 35 mm, ♂ hind wing > 26 mm, ♀ hind wing > 30 mm; postocellar ridges high and broadly swollen. Male cerci without basal externo-lateral dilatation. Posterior margin of vulvar lamina of female deeply and narrowly U-shaped excised in middle, lateral sides of vulvar lamina prolonged rearward along ninth sternum ..... ***P. complicatus*** Selys

- Smaller species: abdomen < 35 mm, ♂ hind wing < 26 mm, ♀ hind wing < 30 mm; postocellar ridges not as above. Basal externo-lateral dilatation of male cerci terminating distally in an acute point 19

19(18). Distal half of branches of epiproct of male almost perpendicularly incurved. Female with postocellar ridges terminating laterally in a tubercle ..... ***P. guyanensis*** Belle

- Distal end of branches of epiproct of male curving inward in an oblique direction. Female with the postocellar ridges laterally low and not terminating in a tubercle 20

20(19). In dorsal view the outer margin of distal end of male cerci regularly curving inward; incurving tip of posterior genital hamules very slender. Posterior margin of vulvar lamina of female excised U-shaped in middle for two-thirds the length of vulvar lamina ..... ***P. approximatus*** Belle

- In dorsal view the outer margin of distal end of male cerci regularly curving outward; incurving tip of posterior genital hamules stout. Posterior margin of vulvar lamina of female excised V-shaped for about half the length of vulvar lamina 21

21(20). In profile view the male cercus extending rearward beyond branch of epiproct for about one-tenth of its length. Posterior margin of vulvar lamina of female narrowly excised in middle, lateral sides of vulvar lamina strongly prolonged rearward along ninth sternum ..... ***P. angeloi*** spec. nov.

- In profile view the terminal fourth of male cercus projecting beyond branch of epiproct. Posterior margin of vulvar lamina of female widely excised in middle, lateral sides of vulvar lamina not prolonged rearward along ninth sternum ..... ***P. nigellus*** Belle

22(17). Small species: abdomen < 30 mm, hind wing < 22 mm; first pale antehumeral stripes more or less wedge-shaped, broad below and tapering to a point halfway the dorsum. Male cerci with an angled basal externo-lateral dilatation. [Posterior margin of vulvar lamina of female deeply excised U-shaped in middle] ..... ***P. brachycnemis*** Needham

- Larger species: abdomen > 30 mm, hind wing > 22 mm; first pale antehumeral stripes not more or less wedge-shaped. Male cerci without externo-lateral dilatation 23

23(22). Larger species: abdomen > 36 mm, ♂ hind wing > 26 mm, ♀ hind wing > 30 mm. Terminal half of branches of epiproct of male curving inward in an oblique direction. Posterior margin of vulvar lamina of female deeply and narrowly excised U-shaped in middle, lateral sides of vulvar lamina prolonged rearward along ninth sternum ..... ***P. complicatus*** Selys

- Smaller species: abdomen < 36 mm, ♂ hind wing < 26 mm, ♀ hind wing < 30mm. Terminal half of branches of epiproct of male strongly recurved inward. Posterior margin of vulvar lamina deeply excised U-shaped in middle, lateral sides of vulvar lamina not prolonged rearward along ninth sternum ..... ***P. recurvatus*** Ris

24(16). Wings with a dark basal spot reaching to first primary antenodal cross-vein ... 25

- Wings without a dark basal spot 27

25(24). Vertex brown around lateral ocelli 26

- Vertex brown with yellow marking around lateral ocelli. [Female with a yellow horn at outer side of each ocellus, the horn directed rearward in an oblique direction. (Male unknown)] ..... ***P. victor*** St. Quentin

26(25). Basal spot of wings blackish brown. Terminal part of branches of epiproct of male stout and forked. [Posterior margin of vulvar lamina of female widely excised U-shaped in middle, lateral sides of vulvar lamina prolonged rearward along ninth sternum] ..... ***P. basistictus*** Ris

- Basal spot of wings brown. Distal half of branches of epiproct of male perpendicularly incurved, this part strongly upcurved at apex (Female unknown) ..... ***P. basalis*** spec. nov.

27(24). Dorsum of pterothorax pale green with indistinct brown marking. [Basal externo-lateral dilatation of male cerci terminating in a very acute spine. Posterior margin of vulvar lamina deeply excised V-shaped in middle, and bottom of excision rounded] ..... ***P. dorsopallidus*** Byers

- Dorsum of pterothorax brown or pale brown with distinct pale antehumeral stripes 28

28(27). First pale antehumeral stripes not connected with pale mesothoracic "half collar". [Branches of epiproct of male black] 29

- First pale antehumeral stripes confluent with pale mesothoracic "half collar" 30

29(28). Male cerci with pointed basal externo-lateral dilatation. [Posterior margin of vulvar lamina of female widely excised V-shaped for about half the length of vulvar lamina, and bottom of excision rounded] ..... ***P. nigellus*** Belle

- Male cerci without basal externo-lateral dilation. (Female unknown) ..... ***P. recticarinatus*** Calvert

30(28). Small species: ♂ abdomen circa 25 mm, ♂ hind wing circa 21 mm. Male cerci with a triangular basal externo-lateral dilatation, anterior genital hamules with a two-pronged inner apical lobe, seminal vesicle (peduncle of penis) pale (Female unknown) ..... ***P. bidentatus*** spec. nov.

- Larger species: abdomen 29-34 mm, hind wing 23-26 mm. Male cerci without a triangular basal externo-lateral dilatation, branches of epiproct of male yellow, inner apical lobe of anterior hamules terminating in a blunt point, seminal vesicle chocolate brown. [Posterior margin of vulvar lamina of female deeply excised U-shaped in middle for about three quarters the length of vulvar lamina] ..... ***P. intricatus*** Hagen in Selys & Hagen

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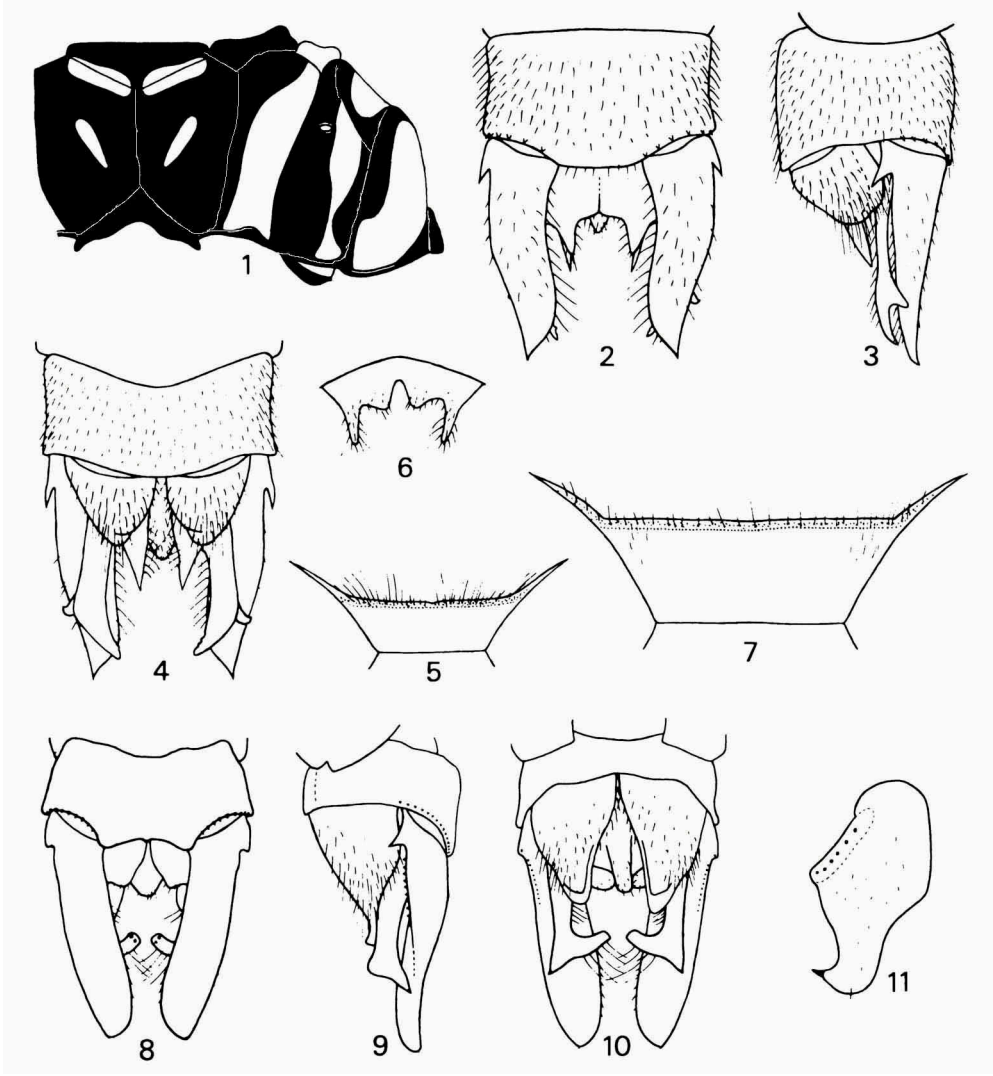
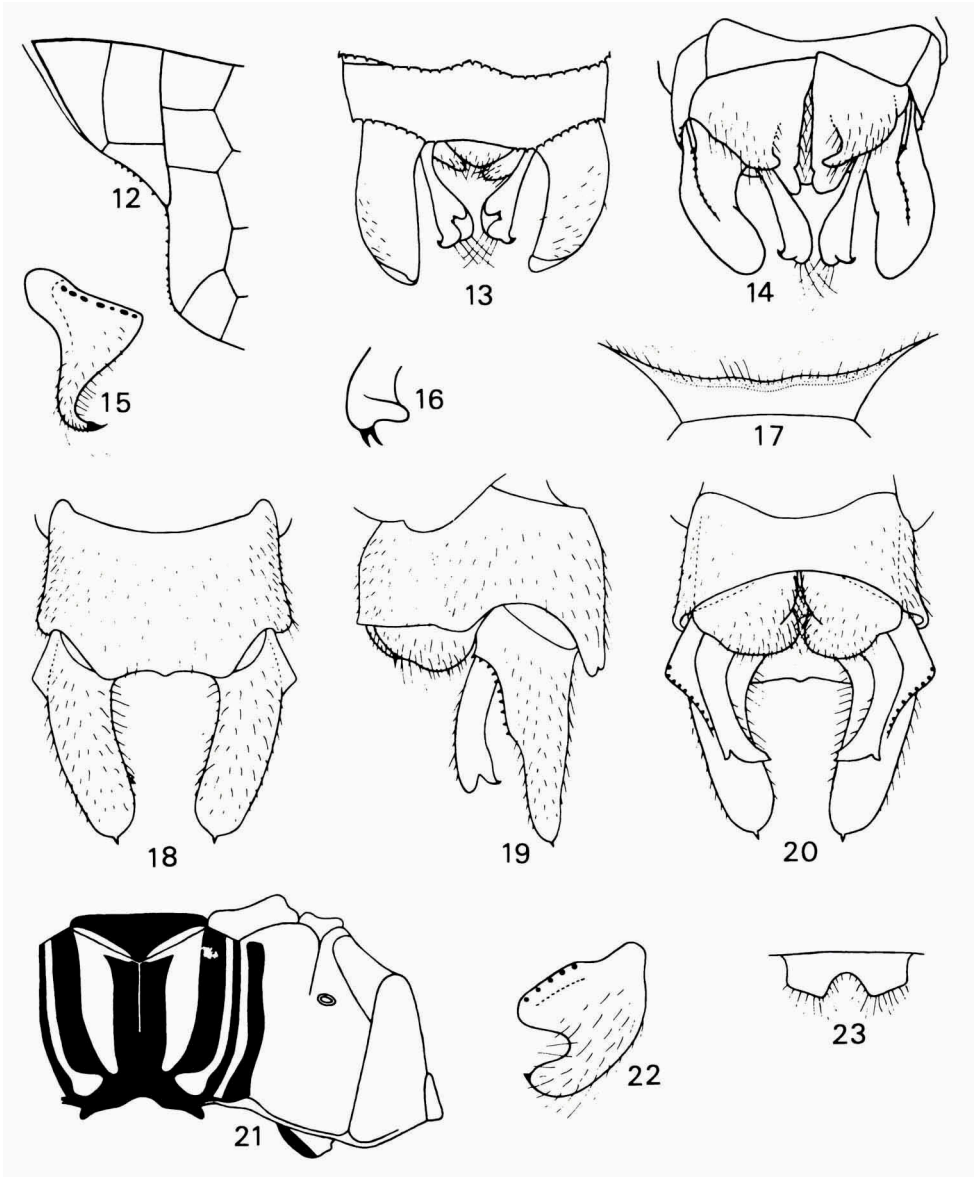


Figs. 1-6, *Progomphus angeloi* spec. nov, ♂ holotype, but fig. 6 of ♀ allotype; figs. 7-11. *Progomphus basalis* spec. nov., ♂ holotype. 1, diagram of pterothoracic colour pattern; 2, 8, tenth abdominal segment and caudal appendages, dorsal aspect; 3, 9, the same, left lateral aspect; 4, 10, the same, ventral aspect; 5, 7, occipital plate; 6, vulvar lamina; 11, left posterior genital hamule, ventral aspect.



Figs. 12-16, *Progomphus bidentatus* spec. nov., ♂ holotype; figs. 17-22, *Progomphus microcephalus* spec. nov., ♂ holotype; fig. 23, *Progomphus nigellus* Belle, first described ♀. 12, anal triangle in left hind wing (transposed); 13, 18, tenth abdominal segment and caudal appendages, dorsal aspect; 14, 20, the same, ventral aspect; 15, right posterior genital hamule, ventral aspect; 16, left anterior genital hamule, ventral aspect 17, occipital plate; 19, tenth abdominal segment and caudal appendages, left lateral aspect; 21, diagram of pterothoracic colour pattern; 22, left posterior genital hamule, ventral aspect. 23, vulvar lamina, ventral aspect.