

Four new species of *Aphylla* from Brazil (Odonata: Gomphidae)

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Abstract: New material of *Aphylla* was obtained in Brazil. *Aphylla janirae* spec. nov. from Dois Irmãos, Pernambuco, *A. linea* spec. nov. from a locality between Cuiabá and Jaciará, Mato Grosso, *A. barbata* spec. nov. from Sta. Isabel do Rio Negro, Amazonas, and *A. exilis* spec. nov. from Gurupá, Pará, are described and illustrated. A key to the males of *Aphylla* is constructed to incorporate the new species.

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Introduction

This contribution to the knowledge of the neotropical Gomphidae deals with material of *Aphylla* Selys collected in Brazil. Four new taxa in *Aphylla* have been detected, each of them represented by only a single male. Two of these males I found in the collection of the Museu Nacional at Rio de Janeiro during my visit to that museum in 1991. The specimens were kindly handed over to me by Profesora Dr Janira Costa. The males belonging to the other two species have been found in a consignment of Brazilian Gomphidae which I received from Professor Dr Angelo B. M. Machado, Belo Horizonte.

In the following pages I present descriptions and illustrations of these four species. My key (Belle, 1992) to the males of *Aphylla* has been modified to incorporate the males of the present new species. The types are deposited in the Museu Nacional at Rio de Janeiro (MNRJ) and in the personal collection of Professor Machado (CM).

The illustrations were made from original camera lucida drawings, the details being completed by free hand. The pictures of the thoracic colour pattern, however, are diagrammatic.

Aphylla janirae spec. nov. (figs. 1, 4, 10-12)

Type material

Holotype: ♂, Brazil, State of Pernambuco, Dois Irmãos, 22.vii.1944, Berla leg., MNRJ (No. 16814).

Diagnosis

This species is intermediate between *Aphylla theodorina* (Navás) and *Aphylla producta* Selys and perhaps more related to the first species than to the second one. The distinguishing male characters are: Costae of wings with an inconspicuous yellow line; they are bright yellow in *A. theodorina*. Labrum largely brown; in *A. producta* brown with a symmetric pair of pale spots, in *A. theodorina* largely yellow. Occipital plate resembling that of *A. producta* being about twice as long transversely as it is wide middorsally (fig. 10); in *A. theodorina* about three times as long (fig. 14). Anterior genital hamule small and low; in *A. theodorina* large and prominent (cf. Belle, 1970: fig. 14; 1992: fig. 41). Transverse lamella of seminal vesicle prominent as in *A. producta* and in middle deeply excised V-shaped (fig. 11); in *A. theodorina* low and medially excised. Posterior cell of anal triangle in hind wings wide (fig. 12); it is narrow in *A. theodorina* (fig. 13). Middorsum of eighth abdominal segment with a pale, lanceolate, basal spot, a character observed in *A. theodorina* but not in *A. producta*. Postero-inferior lateral end of tenth abdominal segment resembling that of *A. theodorina* being not produced backward but more or less downward; in *A. producta* produced backward in a point.

Description

Male (holotype; abdomen broken in pieces; right middle leg broken off). – Total length 47 mm; abdomen 34 mm (including appendages 2.2 mm); hind wing 33 mm; costal edge of pterostigma in fore wing 4.5 mm.

Head: Face brown but base of mandibles, anteclypeus and postero-lateral areas of postclypeus yellow. Superior surface of frons brown along base, yellow for its anterior third. Vertex brown. Occipital plate greenish yellow, the posterior ridge very slightly convex and fringed with pale brown hairs. Rear of head brown above, brown-yellow below.

Thorax: Prothorax brown, the middle lobe with a middorsal greenish yellow spot. Pterothorax brown with green stripes, its colour pattern of the usual type with the first pale antehumeral stripe neither connected with the pale mesothoracic "half collar" nor with the second pale antehumeral stripe (Type 1 of Belle, 1992).

Legs: Femora brown but inner side of first pair of femora green. Tibiae, tarsi and claws very dark brown, almost black. Lamina tibialis of first tibiae about two-fifths the tibial length.

Wings: With slight brown tinge. Venation dark brown. Pterostigma brownish yellow. Basal subcostal cross-vein present. Nodal index 11: 19-20: 12/13: 14-15: 13. Second primary antenodal cross-vein the seventh in fore wings, the sixth in hind wings. Intermedian cross-veins 9-9/6-7. Supratrangles, subtriangles and discoidal triangles two-celled but discoidal triangle in right hind wing three-celled with the dividing cross-veins tri-radiate from the centre. Trigonal interspaces starting with a row of three cells against triangle followed by two rows of cells.

Abdomen: Predominantly brown on basal segments, becoming brown-yellow on apical segments. Segment 2 yellow on middorsum and auricles. Lateral dilatations of segments 8 and 9 yellow, those of segment 8 about 0.15 mm wide, those of segment 9 narrower. Width of dorso-apical rim of segment 10 a quarter of the segment's length. Hind dorsal margin of segment 10 with denticles at level of bases of cerci and with a shallow rounded median

notch. Subapical superior groove of cerci about one-fifth the length of cercus. Segment 10 and caudal appendages shaped as shown in figures 1 and 4. Accessory genitalia of the usual type.

Etymology: The new taxon is named in honour of Profesora Dr Janira M. Costa who kindly invited me to work on the Gomphidae preserved in the Museu Nacional at Rio de Janeiro.

Aphylla linea spec. nov.

(figs. 2, 5, 15-16)

Type material

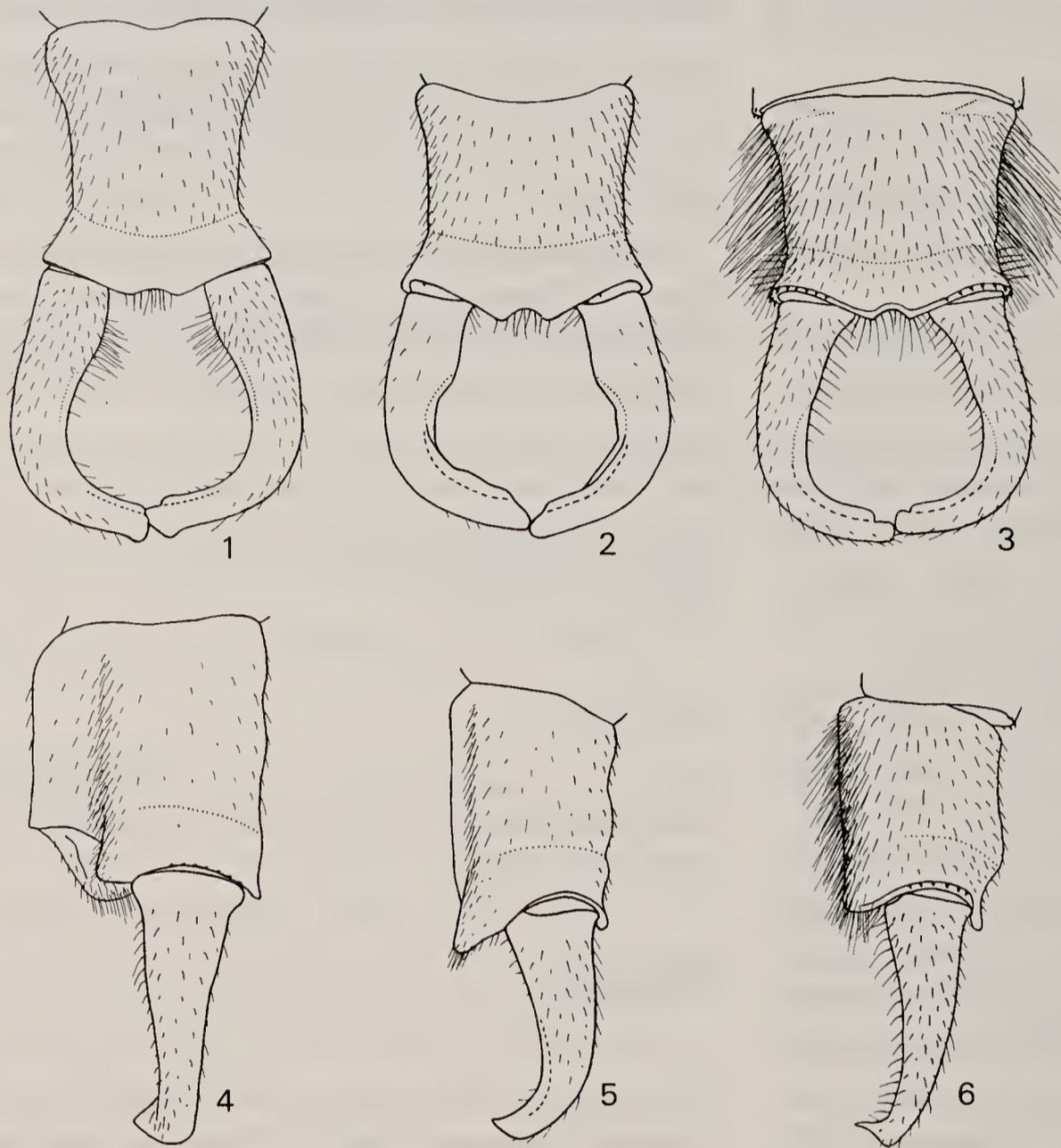
Holotype: ♂, Brazil, State of Mato Grosso, between Cuiabá and Jaciará, 8.iv.1963, N. Santos & Machado leg., MNRJ (No. 24501).

Diagnosis

The male of this species resembles that of *Aphylla producta* taken by Professor Jurzitza at the Iguazú Falls, Argentina (Belle, 1992), in having a thoracic colour pattern of the same type (fig. 15) but differs from it in having the apical internal groove on the upper margin of the cerci longer and better developed (fig. 2), in having the transverse lamella of the seminal vesicle less prominent but more widely excised V-shaped with the interval between the lobes a little more than 70° (fig. 16) and in having the frontal margin of the wing costa provided with a yellow line (interrupted by numerous black dots) from base to apex of wing i.e. that the frontal margin of the pterostigma is also bicoloured, a feature not yet observed in specimens of *Aphylla*.

Description

Male (holotype; abdomen broken between 5-6; tarsus and claws of left hind leg, right hind leg, left middle leg and left fore leg broken away; right fore leg broken off). – Total length 57 mm; abdomen 44.5 mm (including appen-



Figs. 1-6. Tenth abdominal segment and caudal appendages of *Aphylla*; 1-3, dorsal view; 4-6, left lateral view; 1, 4, *A. janirae*; 2, 5, *A. linea*; 3, 6, *A. barbata*.

dages 2.4 mm); hind wing 32 mm; costal edge of pterostigma in fore wing 4.3 mm.

Head: Face brown, the following yellow: Genae, mandibles for their basal two-thirds, the paired large oblong spots on labrum (these spots not connected), anteclypeus, and the lateral spots on postclypeus. Superior surface of frons brown along base, yellow for its anterior two-thirds. Vertex brown but concave area behind paired ocelli green. Occipital plate green, the posterior ridge straight and fringed with short brown hairs. Rear of head brown, yellow on lateral sides and with a yellow postoccipital spot. Labium and adjacent mouth parts pale yellow, the frontal border of the middle lobe almost evenly convex.

Thorax: Prothorax largely green-yellow, its hind lobe brown-yellow. Pterothorax brown with green stripes. The first pale antehumeral stripe widely confluent with the pale mesothoracic "half collar" and dorsally connected with the second pale antehumeral stripe (Type 4 of Belle, 1992). Antealar sinus (meso-para-

ptera) almost without denticles, only one denticle on right tip and three very small denticles near left tip.

Wings: Clear. Venation brown but costa bicoloured as described above. Pterostigma brown-yellow. Basal subcostal cross-vein present. Nodal index 11:20-19:12/13:14-13:12. Second primary antenodal cross-vein the seventh in fore wings, the fifth in hind wings. Intermedian cross-veins 10-10/7-6. Subtriangle in hind wings open. Supratrangles, subtriangle in fore wings and discoidal triangle in hind wings two-celled. Discoidal triangle in fore wings three-celled with the dividing cross-veins tri-radiate from the centre. Trigonal interspace with two rows of cells, that in the hind wings starting with an extra initial cell at hind angle of triangle. There is a tendency to have a two-celled anal loop in the hind wings.

Legs: Brown but tarsi and claws darker. Lamina tibialis of first tibia one-third the tibial length.

Abdomen: Predominantly brown-yellow but

more yellow on basal segments and more brown-orange on apical segments. Apical segments sparsely provided with short soft hairs. Lateral dilatations of eighth segment 0.2 mm wide, those of segment 9 slightly narrower. Hind dorsal margin of segment 10 with one or two black denticles at level of bases of appendages and with a rather deep rounded notch in middle. Width of dorso-apical rim of segment 10 middorsally about a quarter of the segment's length. Segment 10 with a rather conspicuous symmetric pair of depressed areas close against dorsal apical rim. Postero-inferior lateral end of segment 10 well produced backward in a blunt point. Segment 10 and caudal appendages shaped as shown in figures 2 and 5. Cerci brown. Subapical superior groove of cerci about two-fifths the length of cercus. Accessory genitalia of the usual type.

***Aphylla barbata* spec. nov.**

(figs. 3, 6-7)

Type material

Holotype: ♂, Brazil, State of Amazonas, Sta. Isabel do Rio Negro (old name Tapurucuara), 23.vii.1962, Tatico leg., CM.

Diagnosis

This species is very peculiar in having the inferior lateral margins of the tenth abdominal segment of the male densely fringed with long stiff brown hairs. This extraordinary character, that suggests the specific name, enables us to distinguish at once the male of this species from that of all other congeners.

Description

Male (holotype; left side of pterothorax crushed; abdomen broken between segments 3-4, 4-5 and 6-7). – Total length 53.5 mm; abdomen 41.5 mm (including appendages 2.0 mm); hind wing 33.5 mm; costal edge of pterostigma in fore wing 4.5 mm.

Head: Face brown with pale (= greenish

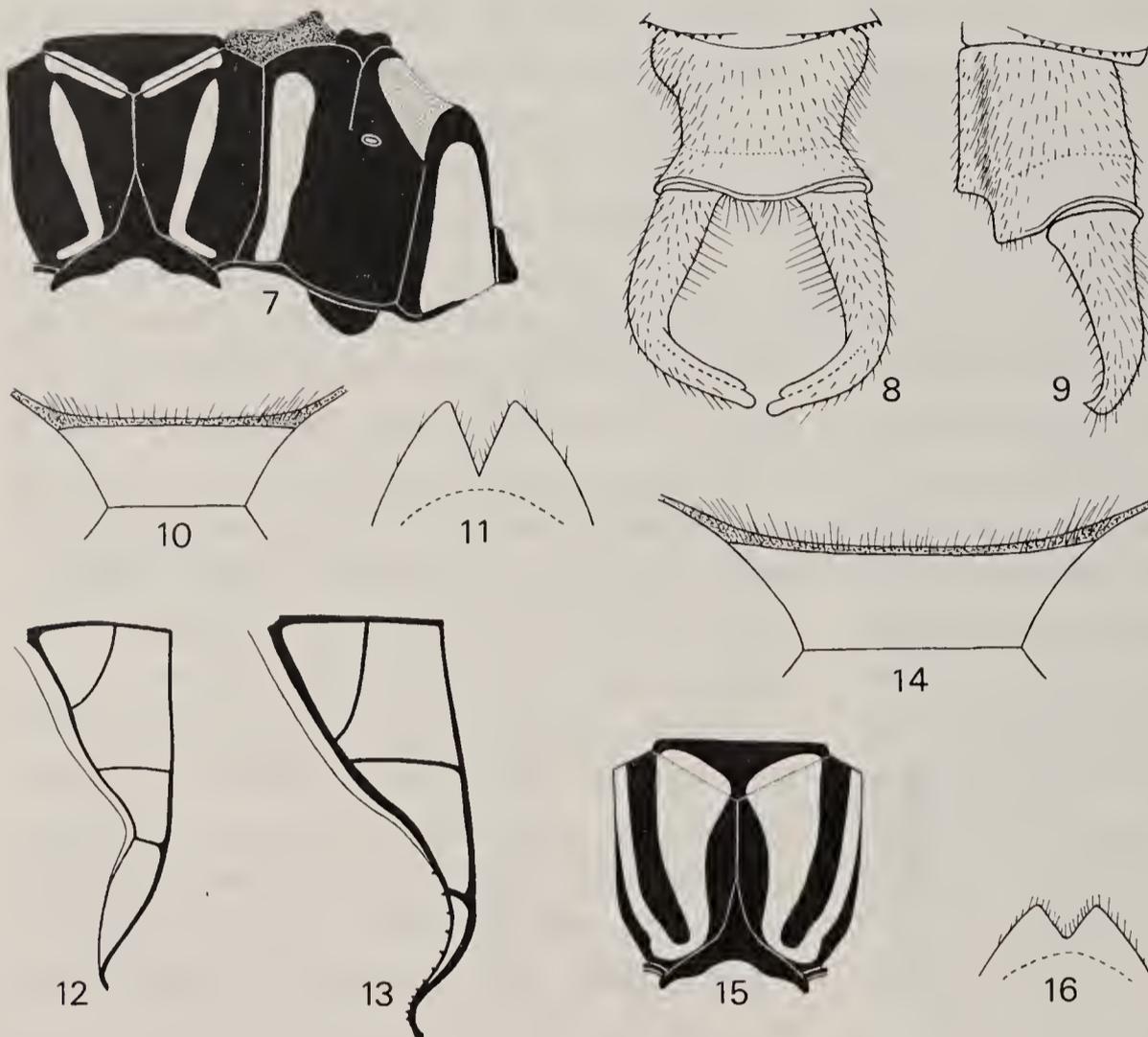
yellow) markings. Base of mandibles pale. Labrum with a symmetric pair of oblong spots in midfield. Anteclypeus pale at lateral sides. Facial lobes of postclypeus pale on posterior half, the lateral spots connected by a narrow pale band bordering vertical part of frons. Superior surface of frons with a brown basal band and a broad pale anterior band that is narrower in middle. Vertex dark brown with a small green spot in middle of depressed area behind paired ocelli. Occipital plate green, edged with brown, the posterior ridge straight and fringed with brown hairs. Rear of head brown above, becoming brown-yellow below.

Thorax: Prothorax dark brown, the middle lobe with a small green middorsal twin-spot. Pterothorax with pale (= greenish yellow) stripes. First pale antehumeral stripe narrow, not connected with the narrow pale mesothoracic "half collar" and markedly prolonged along the antealar sinus. No second pale antehumeral stripe. Pale mes- and metepimeral stripes well-developed. There is no pale metepisternal stripe. Thoracic colour pattern shaped as shown in figure 7.

Legs: Femora reddish brown. Tibiae, tarsi and claws black.

Wings: Venation dark brown including frontal margin of costa. Pterostigma brown yellow. Basal subcostal cross-vein present. Nodal index 12:18-20:12/12:13-14:13. No distinct second primary antenodal cross-vein. Intermedian cross-veins 10-10/5-6. Supratrangles two-celled. Subtriangles in fore wings two-celled, in hind wings one-celled. Discoidal triangle in right hind wing two-celled, in other wings three-celled. Trigonal interspaces starting with a row of three cells against triangle followed by two rows of cells.

Abdomen: Predominantly brown to dark brown. Segment 2 with a narrow yellow middorsal stripe. Segments 3 to 7 with a fine yellow line on middorsum. End segments becoming brown-orange on venter and lateral sides. Hairs on venter of segments 1 and 2 notably long. Sternum (sternite) of segments 7 and 8 with long soft pale hairs. Lateral dilatations of segment 8 about 0.15 mm wide, those of segment 9 narrower. Postero-inferior lateral



Figs. 7-16. 7, *Aphylla barbata*; 8, 9, *A. exilis*; 10-12, *A. janirae*; 13, 14, *A. theodorina*; 15, 16, *A. linea*; 7, diagram of thoracic colour pattern; 8, tenth abdominal segment and caudal appendages, dorsal view; 9, tenth abdominal segment and caudal appendages, left lateral view; 10, 14, occipital plate, dorsal view; 11, 16, transverse lamella of seminal vesicle, posterior view; 12, 13, anal triangle in right hind wing; 15, diagram of colour pattern of thoracic dorsum.

end of segment 10 not produced backward but somewhat downward. Width of dorso-apical rim of segment 10 two-sevenths of the segment's length. Hind dorsal margin of segment 10 with denticles at level of bases of cerci and with a rather deep, rounded, median notch. The cerci are brown and have no distinct shoulder, the subapical superior groove is about one-third the length of cercus. Segment 10 and caudal appendages shaped as shown in figures 3 and 6. Accessory genitalia of the usual type. Anterior genital hamule brown. Posterior genital hamule black-brown and with a strong tip. Transverse lamella of seminal vesicle low and medially excised V-shaped.

***Aphylla exilis* spec. nov.**
(figs. 8-9)

Type material

Holotype: ♂, Brazil; State of Pará, Gurupá, 17.x.1970, collector unknown, CM.

Diagnosis

This species is closely related to *Aphylla brevipes* Selys but it is a smaller and paler species. The only specimen is a somewhat teneral male the colours of which being not fully developed. It differs markedly from the male of *A. brevipes* in the following points: Hind wing 28 mm; in *A. brevipes* 33-35 mm. Pterostigma surmounting 4½-5½ cells; in *A. brevipes* 6-7 cells. Prothorax entirely yellow; in *A. brevipes* brown with yellow marking on dorsum. Dorsum of abdominal segments 8 and 9 pale yellow (in the living specimen probably orange); in *A. brevipes* predominantly brown to blackish brown. Superior caudal appendages pale brown on basal two-thirds, dark brown on apical one-third; in *A. brevipes* entirely dark brown.

Description

Male (holotype; somewhat teneral and not yet fully coloured; abdomen broken between seg-

ments 3-4 and 6-7). – Total length 50 mm; abdomen 39 mm (including appendages 1.5 mm); hind wing 28 mm; costal edge of pterostigma in fore wing 2.8 mm.

Head: Face largely brown. Mandibles pale yellow on outer basal half. Labrum with a symmetric pair of small pale yellow spots. Anteclypeus pale green. Facial lobes of postclypeus pale yellow on posterior half, these lateral pale markings not connected by a pale band in front of vertical part of frons. Superior surface of frons pale yellow on its anterior two-thirds for its whole breadth, brown on its basal one-third portion. Vertex brown but depressed area behind paired ocelli green. Occipital plate of the usual type, green with the brown posterior ridge almost straight and fringed with brown hairs. Rear of head brown-yellow. Labium and adjacent mouth parts pale yellow.

Thorax: Pterothorax brown with green stripes, with the first pale antehumeral stripes connected with the pale mesothoracic "half collar" and the second pale antehumeral stripes (Type 4 of Belle, 1992). The brown colour between the yellow middorsal carina and the first pale antehumeral stripes less pronounced. The three lateral pale stripes well developed with the pale metepimeral stripe widest.

Wings: Clear but slightly brown coloured at extreme bases. Venation brown but frontal margin of costa with a very weakly developed yellow line. Pterostigma brown-yellow. Basal subcostal cross-vein present. Nodal index 10-17-17:10/11:13-13:12. Second primary antenodal cross-vein the fifth in right hind wing, the sixth in other wings. Intermedian cross-veins 8-9/6-6. Subtriangle in hind wings open. Supratrangles, discoidal triangles and subtriangle in fore wings two-celled. Anal triangle in hind wings four-celled. There is a tendency to have a two-celled anal loop in the hind wings.

Legs: Femora pale reddish brown, becoming dark brown at knees. Anterior outer margin of hind femur with a row of about 25 very short spines. Tibiae, tarsi and claws dark brown.

Abdomen: Basal segments 1 and 2 largely greenish yellow. Segments 3 to 6 predominantly brown with pale yellow ventral tergal

margins. Segment 3 with large yellow side spots at base and apex of segment. Sides of segments 4 to 6 with a yellow basal spot which diminishes in size, successively. Segment 7 pale yellow on middorsum, pale brown on sides, the ventral tergal margins pale yellow. Lateral dilatations of segment 8 about 0.2 mm wide, those of segment 9 about 0.15 mm wide. Middle part of hind dorsal margin of segment 8 free from denticles. Width of dorso-apical rim of segment 10 about a quarter of the segment's length. Hind dorsal margin of segment 10 almost straight in middle and free from denticles. Postero-inferior lateral end of segment 10 slightly produced backward. Segment 10 and caudal appendages shaped as shown in figures 8 and 9. Accessory genitalia pale yellow and of the usual type. Transverse lamella of seminal vesicle yellow, low and medially excised V-shaped.

Key to the males of *Aphylla*

1. Costa of wings largely bright yellow. Postero-inferior lateral end of tenth abdominal segment more or less produced downward and pointed or rounded. Anterior (lower) part of postclypeus largely pale [Brazil, Guyana, Perú, Venezuela] *A. theodorina* (Navás)
- Costa of wings brown to black, the frontal margin sometimes with a yellow line (interrupted by numerous black dots). Anterior half of postclypeus brown. 2
2. Second pale antehumeral stripe absent or weakly developed and often interrupted; first pale antehumeral stripe present and notably prolonged along antearlar sinus 3
- Second pale antehumeral stripe well-developed and sometimes connected with the first pale antehumeral stripe..... 5
3. Postero-inferior lateral end of tenth abdominal segment not produced backward in a point but more or less produced downward. Inferior lateral margins of tenth abdominal segment densely fringed with long stiff brown hairs [Brazil (Amazonas)] *A. barbata* spec. nov.
- Postero-inferior lateral end of tenth abdominal segment produced backward in a point. Inferior lateral margins of tenth abdominal segment not unusually haired i.e. fringed with short hairs 4
4. Hind wing 33-35 mm. Cerci very stocky; shoulder well-developed, its inner margin concave and with a strongly projecting angulation at apex [Argentina, southern Brazil] *A. distinguenda* (Campion)
- Smaller species; hind wing 28-30 mm. Shoulder of

- cerci weakly developed; its inner margin straight and strongly rounded at apex [Guyana, Venezuela].....
..... *A. alia* Calvert
5. Cerci without shoulder..... 6
– Shoulder present, although sometimes weakly developed..... 7
6. Cerci regularly curved for its whole length, the inner margin with a thin sprig-like projection near mid-length. Postero-inferior lateral end of tenth abdominal segment strongly produced backward in a point [Perú]..... *A. spinula* Belle
– Cerci of the usual type with the apical third strongly curved inward. Postero-inferior lateral end of tenth abdominal segment moderately produced backward in a blunt point [Brazil (Amazon region), Paraguay, Perú]..... *A. edentata* Selys
7. Hind wing > 40 mm 8
– Hind wing < 38 mm 9
8. Lateral sides of pterothorax with the pale stripes narrower than the dark stripes. Tibiae dark reddish brown. Hind dorsal margin of tenth abdominal segment denticulated at level of bases of cerci; these cerci with well-developed shoulder [Perú].....
..... *A. robusta* Belle
– Lateral sides of pterothorax with the pale stripes much wider than the dark stripes. Tibiae black. Hind dorsal margin of tenth abdominal segment without denticles. Cerci with weakly developed shoulder [Ecuador]..... *A. silvatica* Belle
9. Shoulder of cerci with concave inner margin which ends in a projecting angulation at apex..... 10
– Inner margin of shoulder straight or almost straight 11
10. Cerci with stout shoulder; in dorsal view each cercus about twice as wide at shoulder as it is beyond it. Postero-inferior lateral projection of tenth abdominal segment short and bluntly pointed. Tibiae almost black, contrasting with the brown femora [Brazil (Amazon region), Guyana]..... *A. molossus* Selys
– Shoulder slender, in dorsal view less than one and a half times as wide as the cercus beyond it. Postero-inferior lateral prolongation of tenth abdominal segment long and slender. Tibiae brown and of nearly the same colour as femora [South America (east of Andes)]..... *A. dentata* Selys
11. Inner portion of shoulder of cerci elevated and discernible in a side view of the cercus. Hind tibiae brown and of nearly the same colour as hind femora. Fore wing 23-24 antenodals and 15 postnodals [Brazil (Rondônia)]..... *A. scapula* Belle
– Inner portion of shoulder not discernible in a side view of the cercus 12
12. Frontal margin of wing costa with a yellow line from base of wing to beyond pterostigma. Interval between lobes of seminal vesicle a little more than 70° [Brazil (Mato Grosso)] *A. linea* spec. nov.
– Frontal margin of wing costa entirely brown or with a yellow line from base of wing to proximal end of pterostigma..... 13
13. Small species; hind wing < 30 mm. Postero-inferior lateral end of tenth abdominal segment slightly produced backward. Prothorax brownish yellow to yellow [Brazil (Pará)] *A. exilis* spec. nov.
– Larger species; hind wing > 30 mm; prothorax largely brown, generally with yellow dorsal marking ... 14
14. Postero-inferior lateral end of tenth abdominal segment not produced backward but more or less produced downward [Brazil (Pernambuco)].....
..... *A. janirae* spec. nov.
– Postero-inferior lateral end of tenth abdominal segment produced backward in a point..... 15
15. A blackish species. Postclypeus with a pale posterior cross-band. Middorsal part of posterior margin of tenth abdominal segment straight or slightly concave. Cerci markedly stout with strong shoulder. Distance between bases of cerci distinctly smaller than basal width of cercus (central Brazil).....
..... *A. brasiliensis* Belle
– Dark colours of body predominantly brown, the apical abdominal segments often brown-orange. Distance between bases of cerci as large as or larger than basal width of cercus..... 16
16. Lateral margins of eighth abdominal segment unexpanded or very narrowly expanded with dilatations less than 0.15 mm wide..... 18
– Lateral dilatations of eighth abdominal segment 0.2-0.5 mm wide..... 17
17. Lateral dilatations 0.4-0.5 mm wide. Dorsal posterior margin of tenth abdominal segment slightly concave at middle [Brazil (Pará), French Guiana, Surinam]
..... *A. brevipes* Selys
– Lateral dilatations of eighth abdominal segment 0.2-0.32 mm wide. Dorsal posterior margin of tenth abdominal segment deeply notched in middle [Central America, Colombia, Venezuela] *A. tenuis* Selys
18. Dorsal posterior margin of tenth abdominal segment generally free or largely free of denticles. Distance between bases of cerci as large as or slightly larger than basal width of cercus..... 18
– Dorsal posterior margin of tenth abdominal segment with denticles at level of bases of cerci. Distance between bases of cerci much larger than basal width of cercus [Bolivia, Perú, Ecuador] ... *A. boliviana* Belle
19. Tenth abdominal segment shorter than ninth abdominal segment. Abdomen < 50 mm [South America (west of Andes)] *A. producta* Selys
– Tenth abdominal segment as long as ninth abdominal segment. Abdomen 53-54 mm [Brazil (Pará)].....
..... *A. caudalis* Belle

References

- BELLE, J., 1970. On the neotropical Gomphidae of Longinos Navás (Odonata). – *Tijdschr. Ent.* 113: 253-260.
- BELLE, J., 1992. A revision of the South American species of *Aphylla* Selys, 1854 (Odonata: Gomphidae). – *Zool. Meded. Leiden* 66: 239-264.

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