A new species of *Phaenocarpa* Foerster (Hymenoptera: Braconidae: Alysiinae) from Brazil

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A new species of the genus *Phaenocarpa* Foerster (Hymenoptera: Braconidae: Alysiinae: Alysiini) from the Atlantic rainforest in Brazil is described and illustrated.

Introduction

The Alysiinae is a very large subfamily of the Braconidae containing over 1000 described species worldwide. Generally, two tribes are recognized: Alysiini Leach, 1815, and Dacnusini Foerster, 1862 (Shenefelt, 1974). The New World genera of the tribe Alysiini were keyed by Wharton (1980, 1997). The New World Dacnusiini were keyed by Riegel (1982) and Wharton (1997), and reviewed by Wharton (1994). Most of the genera of the New World Alysiini have been revised (Papp, 1969; Fischer, 1974, 1975a, b; Wharton, 1977, 1980, 1986, 1988; van Achterberg, 1986). Attempts to redefine larger or more complex groups have met with only partial success, and much work is still needed to delineate more adequately the genera in these large complexes. *Phaenocarpa* is one of the largest genera within the Alysiini (Wharton, 1980). Fischer (1990) revised the Palaearctic species and provided a complete generic synonymy. Papp (1969) revised the Neotropical species of *Phaenocarpa* Foerster s.l. (including *Asobara* Foerster, 1862, as a synonym) and recognized ten species. Fischer (1971) removed *Asobara* from the synonymy and it has been recognized as a separate genus ever since. This leaves five of the species in *Phaenocarpa* as treated in this paper. One, *P. anastrephae* Muesebeck, 1958, is transferred to the genus *Asobara* Foerster, 1862, by the last author because of lacking vein CU1b of the fore wing (*Asobara anastrephae* (Muesebeck, 1958) **comb. nov.**). A sixth species, *P. delicata* Papp, 1969, has several unusual features and its placement is less certain (Wharton, 1980; Fischer, 1994); it is provisionally included in the genus *Idiasta* Foerster, 1862 (Wharton, 1980; Braet & van Achterberg, 2003), but according to Fischer (1994) it should be included in the genus *Rhacalysia* Cameron, 1910, because of the strongly enlarged anterior tentorial pits. Papp (1969) placed the four remaining species in two groups: those with well-developed notauli and those without notauli. Wharton (1994) described three additional species from the Neotropical region and defined two distinct species groups to these and discussed the differences between them. In addition,

two species were described by Trostle et al. (1999) and three species by Braet & van Achterberg (2003).

Terminology is according to Wharton (1980, 1994), Sharkey & Wharton (1997) and Trostle et al. (1999). Collections acronyms are as follows: DCBU (Departamento de Ecologia e Biologia Evolutiva da Universidade Federal de São Carlos, SP, Brasil); MZSP (Museu de Zoologia da Universidade de São Paulo) and RMNH (National Museum of Natural History, Leiden, The Netherlands).

Systematics
Subfamily Alysiinae Leach, 1815
Genus *Phaenocarpa* Foerster, 1862

Key to Neotropical species of the genus *Phaenocarpa* Foerster

(Modified after Braet & van Achterberg, 2003; in brackets wing terminology according to Sharkey & Wharton, 1997).

1. Fourth antennal segment 1.3-1.7 times as long as third segment; 18th antennal segment often white 2
- Fourth antennal segment at most 1.1 times as long as third segment, if 1.1 times then 18th antennal segment brown 10
2. Second submarginal cell of fore wing short, with vein 3-SR [= 3RSa] about as long as vein 2-SR [= 2RS] or slightly shorter 3
- Second submarginal cell of fore wing distinctly longer, with vein 3-SR [= 3RSa] at least 1.2 times longer than vein 2-SR [= 2RS] 4
3. Notauli distinct posteriorly; third tooth of mandible ends about at level of apex of first tooth; mesoscutum black; precoxal sulcus impressed anteriorly; (Peru) ..... ***P. coxalis*** Szépligeti, 1904
- Notauli absent posteriorly, not reaching medio-posterior pit of mesoscutum; third tooth of mandible extending distinctly distad of level of apex of first tooth; mesoscutum mainly dark brown and near notauli yellowish; precoxal sulcus absent anteriorly; (Mexico) ..... ***P. anomala*** Wharton, 1994
4. Mandible with a deep cleft between first and second teeth; vein 2-SR+M [= (RS+M)b] of fore wing distinctly longer than half length of vein m-cu; (Colombia; Venezuela, French Guyana) ..... ***P. pericarpa*** Wharton & Carrejo, 1999
- First and second teeth of mandible connected by a broad, undulant flange, without a deep cleft; vein 2-SR+M [= (RS+M)b] of fore wing short or absent, distinctly shorter than half length of vein m-cu 5
5. Propodeum smooth, except for some rugulae posteriorly; second metasomal tergite yellowish-brown (♂) or brown (♂); 22nd-23rd antennal segments white; clypeus oval, strongly protruding; (French Guyana) ..... ***P. acarinata*** Braet & van Achterberg, 2003
- Propodeum with a median carina and an areola (cf. fig. 5), but areola obsolescent in *P. mexicana* and *P. subtilistriata*; second tergite dark brown or black, if brown (♂) then 22nd-23rd antennal segments brown; shape of clypeus variable 6
6. Clypeus longer than wide, strongly protruding; fourth antennal segment about 2.5 times as long as third segment; propodeal areola weakly developed; (Costa Rica; French Guyana) ..... ***P. heynei*** Papp, 1969

- Clypeus more transverse, moderately protruding (cf. fig. 2); fourth antennal segment 1.5-1.7 times as long as third segment; propodeal areola variable 7
  Note.— If the fourth antennal segment is about as long as third segment, the propodeal areola distinctly developed (fig. 5), the clypeus strongly transverse (fig. 2) and 17th-27st antennal segments of male white, cf. *P. atlantica* spec. nov. from Brazil.

7. First metasomal tergite about 1.6 times longer than its apical width; length of body about 4 mm; propodeal areola obsolescent; [fourth antennal segment about 1.5 times third segment and comparatively robust (fig. 12 in Trostle et al., 1999); exserted ovipositor about 3.3 times as long as mesosoma; 14th-16th antennal segments brown and 17th-18th segments white]; (Costa Rica; French Guyana) ..... ***P. subtilistriata*** Papp, 1969
- First tergite 0.9-1.0 times as long as its apical width; length of body 2.0-2.5 mm; propodeal areola distinct 8

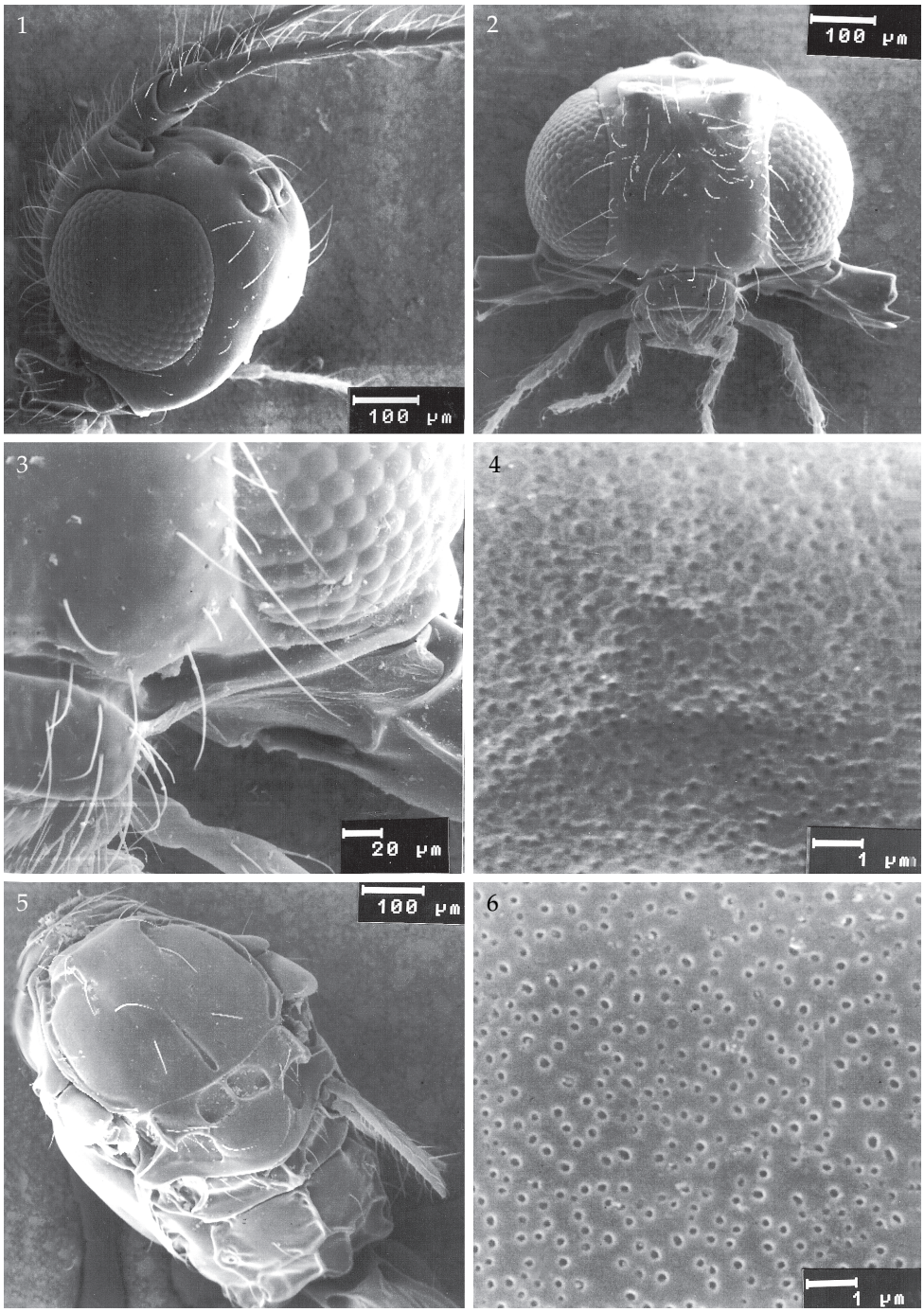
8. Third antennal segment of ♀ dark brown and comparatively robust (fig. 54 in Braet & van Achterberg, 2003); first metasomal tergite brownish-yellow; 14th-18th antennal segments white; (Panama) ..... ***P. areolata*** van Achterberg, 2003
- Third antennal segment of ♀ yellowish and slender (fig. 48 in Fischer, 1988); first metasomal tergite brownish-yellow; 14th-18th antennal segments dark brown or reddish-brown 9

9. Ovipositor distinctly longer than metasoma; fourth antennal segment yellowish; propodeum smooth except for its areolation; (St. Vincent) ..... ***P. pleuralis*** Ashmead, 1894
- Ovipositor about as long as metasoma; fourth antennal segment dark brown; propodeum rugulose except for its smooth areas anteriorly; (Mexico) ..... ***P. mexicana*** Ashmead, 1895

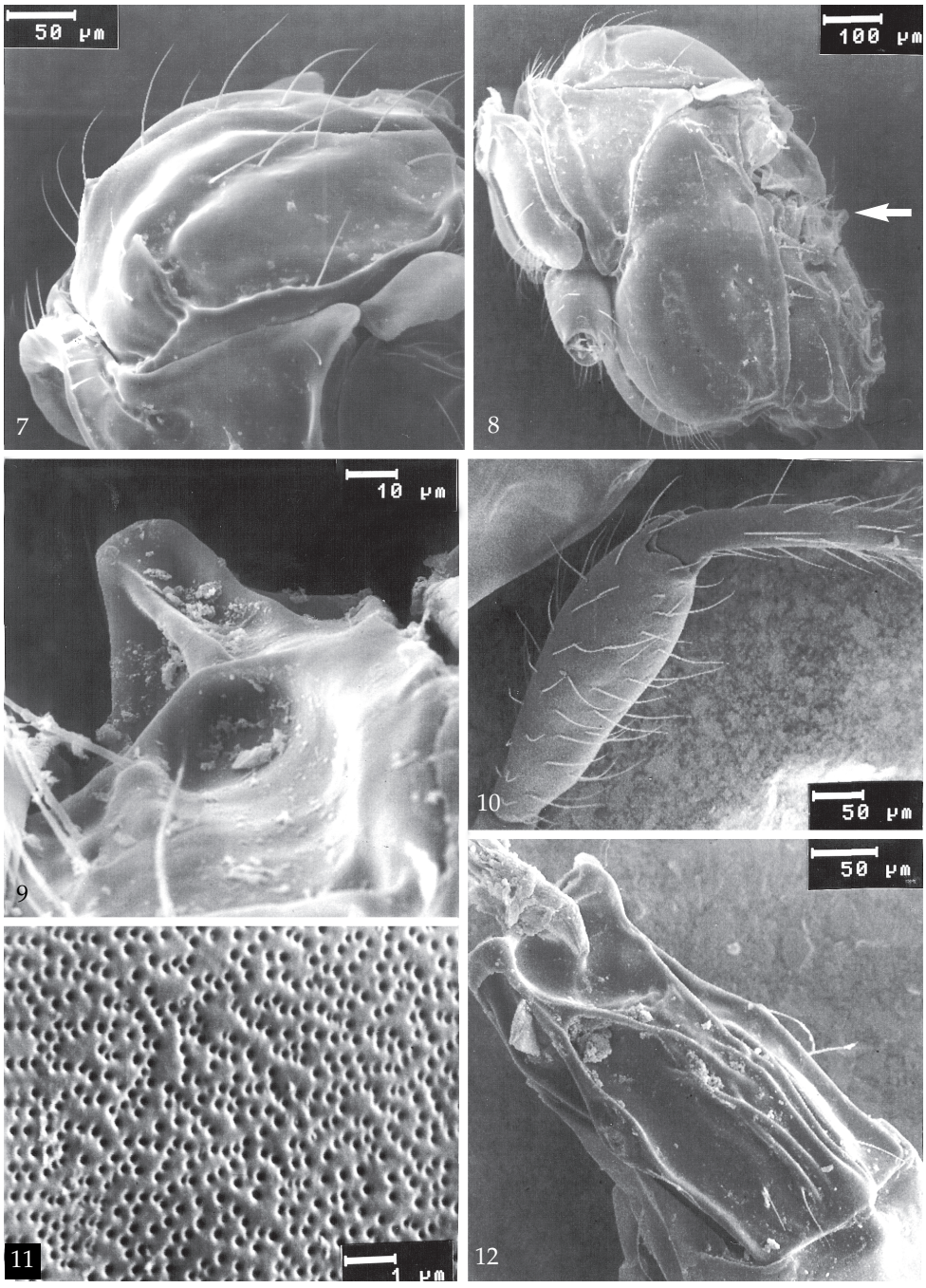
10. Spine-like projection on metanotum much longer than wide, curved and apically blunt; notauli complete, deep and finely crenulate, mesoscutum without separate medio-posterior pit; (French Guyana) ..... ***P. insolita*** Braet & van Achterberg, 2003
- Spine-like projection on metanotum about as long as wide or shorter, straight and apically rather acute; posteriorly notauli absent or very shallowly impressed and smooth, and mesoscutum with separate medio-posterior pit 11

11. Pterostigma of fore wing of male narrow basally, solid throughout, about 5 times longer than wide and divided in two differently pigmented parts of similar width, but without longitudinal hyaline streak (fig. 13); [third antennal segment 0.7-1.0 times as long as fourth segment; propodeal areola distinctly developed (fig. 5); clypeus strongly transverse (fig. 2); 17th-27rd antennal segments white]; (Brazil) ..... ***P. atlantica*** spec. nov.
- Pterostigma of fore wing of male divided by a hyaline, desclerotized line 12

12. Pterostigma of fore wing broad distally, abruptly narrowing basad of junction with r in females, with posterior margin of basal half indistinct; in males part of pterostigma posterior of hyaline region broader than anterior part along anterior margin of wing; mesopleuron, metapleuron and propodeum dark brown; [third antennal segment of ♀ about 8 times as long as wide; 21st-24th to 27th antennal segments white]; (Brazil) ..... ***P. hyalina*** Trostle, 1999
- Pterostigma of fore wing narrow distally and basally, only gradually narrowing basad of junction with vein r in females, with posterior margin of basal half clearly



Figs 1-6. *Phaenocarpa atlantica* spec. nov., ♂, paratype. 1, lateral view of head; 2, face; 3, left anterior tentorial pit; 4, sculpture of clypeal; 5, dorsal posterior view of mesosoma; 6, sculpture of mesoscutum.



Figs 7-12. *Phaenocarpa atlantica* spec. nov., ♂, paratype. 7, lateral view of pro- and mesonotum; 8, left side of mesosoma showing metanotal spine (arrow); 9, metanotal spine; 10, hind femur; 11, sculpture of hind femur ; 12, dorsal view of first tergite.

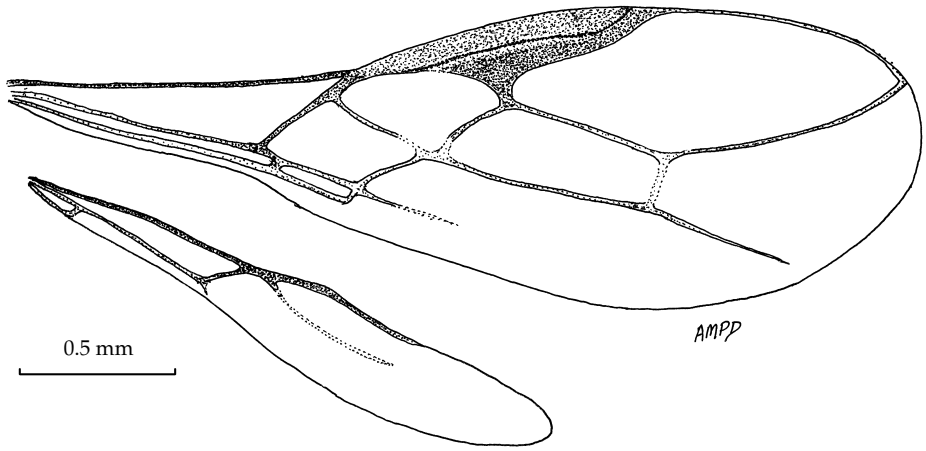


Fig. 13. *Phaenocarpa atlantica* spec. nov., ♂, paratype. 13, wings.

delineated; in males part of pterostigma posterior of desclerotized hyaline region narrower than part along anterior margin of wing; body colour variable 13

13. Mesopleuron, metapleuron and propodeum dark brown contrasting with light brown to yellow mesoscutum; metanotum in lateral view with broadly triangular projection (distinctly broader than high); (Mexico) ... ***P. cratomorpha*** Wharton, 1994
- Mesopleuron, metapleuron and propodeum yellow; metanotum in lateral view with short spine-like projection; (Ecuador) ..... ***P. sharkeyi*** Wharton, 1994

Phaenocarpa atlantica Arouca & Penteado-Dias, spec. nov.
(figs 1-13)

Material.— Holotype, ♂ (DCBU), "**Brazil**, Paraná, Morretes, sweeping the vegetation, 9.iv.2002, M. Tavares". Paratypes (3 ♂♂: DCBU, MZSP, RMNH): 1 ♂, "Brazil, São Paulo, Peruibe, from sweeping vegetation, 5.v.2002, N.W. Periotto"; 1 ♂ "Rio de Janeiro, Santa Maria Madalena, yellow pan trap, 20-23.iv.2002, A.M. Penteado-Dias"; 1 ♂, "Espirito Santo, Santa Tereza, 07.iv.2001, from sweeping vegetation, 7.iv.2001, C.O. Azevedo".

Diagnosis.— This species is a member of the *P. cratomorpha* species group as defined by Wharton (1994). As in other species of this group *P. atlantica* has the second flagellomere barely longer than the first, a median metanotal projection (fig. 8) and the male pterostigma consists of two different parts (fig. 13). *Phaenocarpa atlantica* differs from other described species of this group by having a pterostigma which gradually narrows basally and widens near the junction with vein r, lacking a well-defined hyaline streak, but divided in two differently pigmented parts of similar width (fig. 13). In addition, the posterior margin of the pterostigma is less curved between vein r and its base. *P. sharkeyi* is a more uniformly pale yellowish species; *P. atlantica* has parts of the head, meso- and metasoma more or less brown.

Body length: 2.2 mm; female and biology unknown.

Head.— Head 1.3 times wider than long (figs 1, 2); face 1.3 times higher than wide;

clypeus sculptured (fig. 4), broad, weakly convex, moderately protruding (fig. 2); frons smooth, bare and polished. Mandible 1.6 times longer than width between teeth 1 and 3; tooth 1 broad, nearly orthogonal (fig. 2); distinct cleft present between teeth 1 and 2; tooth 2 triangular, long, 0.5 times apical width of mandible; tooth 3 broadly triangular. Eye large, 3.6 times longer than temple (fig. 1). Anterior tentorial pit medium-sized, groove extending from lateral margin of clypeus to eye (fig. 3). Antenna with 23 segments, third antennal segment 1,2 times as long as fourth segment. Sulcus between eye and antennal socket absent.

Mesosoma.— Mesosoma 1.3 times longer than high (fig. 8). Pronotum largely smooth, with longitudinal carina separating dorsal and lateral parts; mesoscutum sculptured (fig. 6), with anterior margin crenulate near base of notaulus (fig. 7), dorsally with a elongate midpit; scutellum 1.1 times longer than wide (fig. 5); precoxal sulcus distinctly impressed, crenulate (fig. 8); metanotum with short, narrow spine-like projection (figs 8, 9). Propodeum (fig. 5) with median carina anteriorly and areola posteriorly, areola twice longer than wide and 0.4 times length of propodeum.

Wings.— Fore wing with pterostigma narrow basally, solid throughout, 5 times longer than broad and divided in two differently pigmented parts, but without longitudinal hyaline streak (fig. 13). Posterior part of pterostigma darker and as long as anterior part. Pterostigma abruptly widened near junction with r; r short and arising nearly at mid point of pterostigma; 3RSa 2.1 times longer than 2RS; 3RSb extending to wing tip and weakly curved at apex; (RS+M)b present; 1cu-a very short, cell 2CU closed distally; 2-CUb interstitial. Hind wing: m-cu absent; M+CU distinctly shorter than 1-M; 2-M represented by a short stub.

Legs.— Hind femur robust (fig. 10) and sculptured (fig. 11).

Metasoma.— First tergite 1.8 times longer than its apical width, apically 1.4 times wider than basally, dorsal carinae long, but less distinct posteriorly (fig. 12); second and following tergites smooth.

Colour.— Body brown; mesoscutum, scutellum and metanotum light brown; mesopleuron, metapleuron and propodeum brown; first tergite yellow; maxillary palp, prosternum and coxae white, with legs gradually changing to yellow distally; scape and pedicel yellow; 17 basal antennal segments gradually darkening from yellow to brown distally, followed by 6 white antennal segments; wings hyaline.

Variation.— Antenna with 23-27 segments, 16-17 basal segments gradually darkening from yellow to brown distally, followed by 6-10 white segments, and third antennal segment 1.0-1.3 times as long as fourth segment.

Etymology.— The specific name refers to the atlantic forest where the material has been obtained.

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