

**Bembicine wasps (Hymenoptera: Crabronidae: Bembicinae:
Bembicini, except Gorytina) of Rio de Janeiro State (southeast Brazil):
inventory of species and notes on biology**

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BUYS, S.C. **Bembicine wasps (Hymenoptera: Crabronidae: Bembicinae: Bembicini, except Gorytina) of Rio de Janeiro State (southeast Brazil): inventory of species and notes on biology.** *Biota Neotrop.* 12(3): <http://www.biotaneotropica.org.br/v12n3/en/abstract?article+bn01712032012>

Abstract: An inventory of the bembicine wasps (Hymenoptera: Crabronidae: Bembicinae: Bembicini, except Gorytina) found in Rio de Janeiro State is provided, based on the revision of the literature and on the examination of the entomological collections of the Instituto Oswaldo Cruz (CEIOC) and Museu Nacional – Universidade Federal do Rio de Janeiro (MNRJ). Original biological notes on *Rubrica nasuta* (Christ, 1791), *Stictia signata signata* (Linnaeus, 1758) and *Stictia punctata* (Fabricius, 1775) are also provided.

Keywords: *solitary wasps, Aculeata, Atlantic Forest, restinga, geographic distribution.*

BUYS, S.C. **Vespas bembicíneas (Hymenoptera: Crabronidae: Bembicinae: Bembicini, exceto Gorytina) do Estado do Rio de Janeiro (sudeste do Brasil): inventário de espécies e notas sobre biologia.** *Biota Neotrop.* 12(3): <http://www.biotaneotropica.org.br/v12n3/pt/abstract?article+bn01712032012>

Resumo: Um inventário das vespas bembicíneas (Hymenoptera: Crabronidae: Bembicinae: Bembicini, exceto Gorytina) encontradas no Estado do Rio de Janeiro é fornecido, com base na revisão da literatura e exame das coleções entomológicas do Instituto Oswaldo Cruz (CEIOC) e Museu Nacional – Universidade Federal do Rio de Janeiro (MNRJ). Também são fornecidas notas biológicas originais sobre *Rubrica nasuta* (Christ, 1791), *Stictia signata signata* (Linnaeus, 1758) e *Stictia punctata* (Fabricius, 1775).

Palavras-chave: *vespas solitárias, Aculeata, Mata Atlântica, restinga, distribuição geográfica.*

Introduction

Bembicinae (Hymenoptera: Crabronidae) is a worldwide distributed group of solitary wasps, which dig nests in the ground, commonly in sandy soil, and store them with insects of several orders, as Diptera, Orthoptera, Hemiptera, Lepidoptera and Odonata (Bohart & Menke 1976, Evans & O'Neill 2007). The members of the subfamily Bembicinae have been classified into three tribes: Alyssontini (71 spp.), Bembicini (1,411 spp.) and Nyssonini (226 spp.) (Hanson & Menke 2006, Pulawski 2011a). Alyssontini was not recorded from Brazil and Nyssonini is poorly represented, with the most of its species occurring in the Amazonian region (Amarante 2002). On the other hand, Bembicini is widely represented in Brazil and throughout the Neotropical Region (Bohart & Menke 1976, Amarante 2002, Evans & O'Neill 2007). As part of an effort for producing a database on aculeate Hymenoptera of Rio de Janeiro State aiming subsequently to discuss ecological and biogeographic patterns, in the present paper an inventory of the bembicine wasps of the tribe Bembicini (Hymenoptera: Apoidea: Crabronidae: Bembicinae) found in this State is provided, except for the species of the subtribe Gorytina, which will be treated in a further paper. Original biological notes on *Rubrica nasuta* (Christ, 1791), *Stictia signata signata* (Linnaeus, 1758) and *Stictia punctata* (Fabricius, 1775) are also provided.

This study was based on the revision of the literature and on the examination of the entomological collections of the Instituto Oswaldo Cruz (CEIOC) and Museu Nacional – Universidade Federal do Rio de Janeiro (MNRJ). The identification of the species was based mainly on the papers by Parker (1929), Araújo (1939), Willink (1947) and Bohart (1996a, b). Specimens that do not perfectly match with the published descriptions were not included in the paper.

Results

Tribe Bembicini Latreille, 1802

SUBTRIBE BEMBICINA LATREILLE, 1802

Genus *Bembix* Fabricius, 1775

Bembix comantis Parker, 1929

Previous literature records. Parker (1929): Rio de Janeiro State; Amarante (2002): Rio de Janeiro State.

Genus *Bicyrtes* Lepeletier de Saint Fargeau, 1845

Bicyrtes discisus (Taschenberg, 1870)

Records. Itatiaia (500m), 1♂, 1♀, J.F. Zikán, 3.II.1933 (CEIOC); Niterói, 1♀, R. Arlé (MNRJ); Nova Friburgo, 1♀, 1♂, Melo Leitão (MNRJ); idem, 1♀, S. Lopes, 22.IV.1927 (MNRJ); Rio de Janeiro (Floresta da Tijuca), 1♀, C.A.C. Seabra, 26.III.1955 (MNRJ); Silva Jardim (Reserva Biológica de Poço das Antas), 1♀, S. C. Buys, IX.2001 (CEIOC).

Previous literature records. Taschenberg (1870): Rio de Janeiro State, Amarante (2002): Rio de Janeiro State.

Bicyrtes variegatus (Olivier, 1798)

Records. Cabo Frio, 8♀, Carvalho, 05.II.1984 (MNRJ); Itatiaia (700 m), 4♂, J.F. Zikán, 30.III.1938 (CEIOC); Niterói, 1♀, S.S.F.R., 10.XI.1946 (MNRJ); Rio de Janeiro, 3♀, R. Arlé, (MNRJ); Rio de Janeiro (Floresta da Tijuca), 1♀, C.A.C. Seabra, III.1954 (MNRJ); Rio de Janeiro (Guaratiba), 1♀, J.H. Guimarães, I.1956 (MNRJ); Rio de Janeiro (Copacabana), 1♀, C. Moreira (MNRJ); Rio de Janeiro, 1♀, H.S. Lopes, V.1936

(MNRJ); Seropédica (BR 465, Km 47), 1♀, B. Ramos, 27.II.1945 (MNRJ).

Genus *Editha* J. Parker, 1929

Editha adonis Handlirsch (1890)

Previous literature record. Handlirsch (1890: *apud* Pulawski 2011b): Rio de Janeiro State, Rio de Janeiro [According to Pulawski (2011b), *E. adonis* was described based on specimens from “Ipanema, part of Rio de Janeiro”].

Editha fuscipennis (Lepeletier de Saint Fargeau, 1845)

Record. Itatiaia, 1♀, 16.I.1924 (CEIOC).

Genus *Microbembex* Patton, 1979

Microbembex ciliata (Fabricius, 1804)

Record. Rio de Janeiro, 3♀, Arlé (MNRJ).

Genus *Rubrica* Parker, 1929

Rubrica adumbrata (Handlirsch, 1890)

Previous literature record. Amarante (2002): Rio de Janeiro State.

Rubrica gravida (Handlirsch, 1890)

Record. Petrópolis (Pedro do Rio), 3♀, 1♂, C.A.C. Seabra, III.1954 (MNRJ).

Rubrica nasuta (Christ, 1791)

Records. Araruama, 2♀, H. Schubart, 3.XII.1961 (MNRJ); Duque de Caxias (São Bento), 1♀, P.A. Teles, 18.II.1951 (MNRJ); idem, 3♀, P.A. Teles, XII.1973 (MNRJ); Itaguaí, 1♀, L. Fernandes, 01.I.1957 (MNRJ); Itatiaia (700 m), 1♀, J.F. Zikán, 24.II.1940 (CEIOC); idem, 1♀, J.F. Zikán, 16.III.1941 (CEIOC); Maricá (Restinga de Barra de Maricá), 1♀, S.C. Buys, 13.III.2001 (CEIOC); Rio de Janeiro, 9♀, H.S. Lopes, 07.V.1936 (MNRJ); idem, 3♀, 1♂, R. Arlé (MNRJ); idem, 1 exemplar, II.1926 (MNRJ); Rio de Janeiro (Floresta da Tijuca), 7♀, C.A.C. Seabra, I.1951 (MNRJ); Rio de Janeiro (Deodoro), 1♀ (MNRJ); idem, 1♀, W. Zikán, 09.V.1940 (MNRJ); idem, 1♀, W. Zikán, 10.X.1937 (MNRJ); Seropédica (Universidade Federal Rural do Rio de Janeiro), 1♀, J.H. Guimarães, 1957 (MNRJ); Seropédica (BR 465, Km 47), 1♀, J.F. Zikán, 15.II.1957 (MNRJ).

Previous literature records. Bradley (1921, p. 54); Amarante (2002): Rio de Janeiro State.

Biological notes. This species was commonly observed in the summer of 2001 in the Restinga de Barra de Maricá (city of Maricá). The nests were found near margins of an unpaved road in compacted soil composed of sand and clay. One female spent about 20-30 minutes to dig a burrow of 7 cm in depth and 1 cm in diameter. Another observed nest was about 10.5 cm in depth. Specimens of *Ornidia obesa* (Fabricius, 1775) (Diptera: Syrphidae) and an unidentified horse-fly (Diptera: Tabanidae) were found as prey inside the nests. *Rubrica nasuta* is relatively well studied and the herein presented observations generally agree with observations made in other places (review in Evans & O'Neill 2007).

Genus *Stictia* Illinger, 1807

Stictia maccus (Handlirsch, 1895)

Records. Angra dos Reis, 1♀, L. Travassos, XII.1932 (MNRJ); Rio de Janeiro, 2♀ (no further dates) (MNRJ).

Stictia punctata (Fabricius, 1775)

Records. Angra dos Reis, 1♀, L. Travassos, XII.1932 (MNRJ); Cabo Frio, 5♀, Carvalho, 05.II.1984 (MNRJ); idem, 3♀, Carvalho, 03.XI.1984 (MNRJ); Itaperuna, 2♀, Alceir Castro (MNRJ); Niterói (Jurujuba), 2♀; Rio de Janeiro (Marambaia) (CEIOC), 2♀, Alceir Castro, I.1953 (MNRJ); Seropédica (BR 465, Km 47), 1♀ (MNRJ).

Previous literature record. Amarante (2002): Rio de Janeiro State.

Biological notes. The biology of this species is known only for the notes by Evans & Matthews (1974), based on 10 nests observed in Colombia, and short observations by Amarante (1996) on hunting tactics (review on biology in Evans & O'Neill 2007). Herein additional observations on habitat are provided as follows: dense and large nesting aggregations with dozen of specimens were observed in flattened sandy soil in areas of restinga vegetation and in the superior portion of beaches from west zone of Rio de Janeiro city in the summer of 2002. Nesting females were also observed in the superior portion of beaches in the city of Niterói sparsely distributed in vertical sandy banks

severely exposed to the sun. One nest was excavated, but cells were not found. This nest consisted of a long tunnel, at least of 50 cm in depth.

Stictia signata signata (Linnaeus, 1758)

Records. Duque de Caxias (São Bento), 4♀, P.A. Teles, VI.1953 (MNRJ); idem, 2♀, P.A. Teles, XI.1953 (MNRJ); idem, 4♀, P.A. Teles, 30.V.1954 (MNRJ); Maricá (Restinga de Barra de Maricá), 1♀, S. C. Buys, 13.III.2001 (CEIOC); Rio de Janeiro (Guaratiba), 1♀, J.H. Guimarães, I.1956 (MNRJ); Seropédica (BR 465, Km 47), 1♀, Antenor, 15.IV.1945 (MNRJ).

Previous literature record. Amarante (2002): Rio de Janeiro State.

Biological notes. Nesting females were observed in Restinga de Barra de Maricá (city of Maricá) in the summer of 2001. One observed nest was an oblique burrow of 19 cm in depth, excavated in a sandy site exposed to the sun; one specimen of *Biopyrellia bipuncta* (Wiedemann, 1830) (Diptera: Muscidae) was found inside the nest as prey. Adult specimens were observed

Table 1. Richness of bembicine wasps (tribe Bembicini), excluding the subtribe Gorytini, in the Neotropical Region, Brazil, Southeast Region of Brazil and Rio de Janeiro State. Classification by Pulawski (2011a); number of species based on Amarante (2002, 2005), adding the new records provided in the present paper.

Tabela 1. Riqueza de vespas bembicinas (tribe Bembicini), excluindo a subtribo Gorytina, na Região Neotropical, Brasil, Região Sudeste do Brasil e Estado do Rio de Janeiro. Classificação de Pulawski (2011a); número de espécies baseado em Amarante (2002, 2005), adicionando os novos registros fornecidos no presente artigo.

	Neotropical region	Brazil	Southeast region of Brazil	Rio de Janeiro state
Bembicina				
<i>Bembix</i>	16	8	6	1
<i>Bicyrtes</i>	23	10	6	2
<i>Carlobembix</i>	1	0	0	0
<i>Editha</i>	7	6	3	2
<i>Hemidula</i>	2	0	0	0
<i>Microbembix</i>	27	7	3	1
<i>Rubrica</i>	4	3	3	3
<i>Selman</i>	1	1	1	0
<i>Stictia</i>	26	11	7	3
<i>Trichostictia</i>	3	1	0	0
<i>Zyzyx</i>	1	0	0	0
Exeirina				
<i>Argogorytes</i>	8	4	2	0
<i>Clitemnestra</i>	52	12	1	1
<i>Neogorytes</i>	6	0	0	0
<i>Paraphilanthus</i>	1	0	0	0
Handlirschiina				
<i>Pterogorytes</i>	3	3	1	0
Heliocausina				
<i>Acanthocausus</i>	1	0	0	0
<i>Heliocausus</i>	3	0	0	0
<i>Tiguiipa</i>	4	0	0	0
Spheciina				
<i>Sphecius</i>	4	1	1	0
<i>Tanyoprymnus</i>	1	0	0	0
Stictiellina				
<i>Glenostictia</i>	4	0	0	0
<i>Microstictia</i>	5	0	0	0
<i>Steniolia</i>	3	0	0	0
<i>Stictiela</i>	2	0	0	0
Stizina				
<i>Bembecinus</i>	12	7	3	3
Total	220	74	37	16

Table 2. Comparison of the bembicine fauna from three regions of the Rio de Janeiro State with distinct vegetation and geographic aspects, based on the material examined in the present paper.

Tabela 2. Comparação entre a fauna de bembicíneos de três regiões do Estado do Rio de Janeiro com vegetação e aspectos geográficos distintos, baseada no material examinado no presente artigo.

Species/subspecies	Sandy coastal plains	Lowland areas on Serra do Mar, excluding sandy coastal areas	Highland areas on Serra dos Órgãos
<i>Bicyrtes discisus</i>		X	X
<i>Bicyrtes variegatus</i>	X	X	X
<i>Editha adonis</i>	X		
<i>Editha fuscipennis</i>			X
<i>Rubrica gravida</i>			X
<i>Rubrica nasuta</i>	X	X	X
<i>Stictia punctata</i>	X	X	
<i>Stictia signata signata</i>	X	X	
<i>Bembecinus agilis</i>		X	
<i>Bembecinus bolivari</i>	X	X	
<i>Bembecinus quinquespinosus</i>		X	
Total	6	8	5

feeding on flowers of *Borreria* sp. (Rubiaceae). Females were observed following walking people and hover near them in search for prey items. In such occasions, the females attack co-specific wasps that approximate. A similar behaviour of hunting near people was observed by Philippi & Eberhard (1986).

Subtribe Exeirina Dalla Torre, 1897

Genus *Clitemnestra* Spinola, 1851

Clitemnestra densa Bohart, 2000

Previous literature records. Amarante (2002): Rio de Janeiro State.

SUBTRIBE STIZINA A. COSTA, 1859

Genus *Bembecinus* A. Costa, 1859

Bembecinus agilis (Smith, 1873)

Records. Niterói, 1♀, R. Arlé (MNRJ); Rio de Janeiro, 2♀, R. Arlé (MNRJ); Rio de Janeiro, 3♀, H.S. Lopes, 01.1936 (MNRJ); Rio de Janeiro (Floresta da Tijuca - Gávea), 1♀, 1♂, L. Travassos, 09.1935 (MNRJ).

Bembecinus bolivari (Handlirsch, 1892)

Records. Angra dos Reis, 1♀, L.T., 12.1932 (MNRJ); Duque de Caxias (São Bento), 5♀, P.A. Teles, 11.1954 (MNRJ); Macaé (Barra de Sana), 1♀, Alceu, 1.1957 (MNRJ); Niterói (Jurujuba), 1♀, 23.03.1933 (MNRJ); Rio de Janeiro, 1♀, R. Arlé (MNRJ).

Bembecinus quinquespinosus (Say, 1823)

Records. Duque de Caxias (São Bento), 1♀, P.A. Teles, 11.1953 (MNRJ).

Previous literature records. Amarante (2002): Rio de Janeiro State.

Concluding Remarks

Amarante (2002) recorded the occurrence of 74 species of Bembicini, excluding the Gorytina, to Brazil (Table 1). From these species, only seven were cited by this author to Rio de Janeiro State. In the present paper, 16 species are inventoried to Rio de Janeiro State. Certainly this number must be increased with further studies, since almost 40 species of bembicine wasps, other than Gorytina, has been recorded to the Southeast Region of Brazil (Table 1), in

the vicinities of Rio de Janeiro State, and possibly several of these species also occur in this State.

The most of the specimens examined in the preset study came from coastal sandy plains and other lowland areas on the Serra do Mar (Table 2). This is an expected pattern based on the observation that bembicine wasps are conspicuous elements of the fauna of superior portions of not strongly anthropized sandy beaches and areas of restinga throughout the Rio de Janeiro State. In this context, one must consider that the anthropization of coastal areas of Rio de Janeiro State perhaps is favoring the colonization of new sites toward interior lands by bembicine. This is because open sites with sandy soil are favorite places for the nesting of bembicine and unpaved roads seems to be paths of dispersion to ground-nester wasps and bees. Besides this, bembicine do not have strongly specialized food habits (see for example Evans & O'Neill 2007) and they could search for prey items in stocks of vegetation that commonly are present in these devastated areas.

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