

## Inventory of sphecid wasps (Hymenoptera: Apoidea: Sphecidae) from the Espírito Santo State (Southeast Brazil)

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**RESUMO: Inventário de vespas esfecídeas (Hymenoptera: Apoidea: Sphecidae) do Estado do Espírito Santo (Sudeste do Brasil).** Um inventário de espécies de vespas esfecídeas do Estado do Espírito Santo é apresentado com base no exame de coleções entomológicas de cinco grandes instituições públicas brasileiras. Foram identificados 110 exemplares de Sphecidae provenientes do Estado do Espírito Santo, incluindo 23 espécies, das quais nove são ocorrências novas para o estado, não citadas anteriormente na literatura: *Ammophila gracilis* Lepeletier, 1845; *Eremnophila binodis* (Fabricius, 1798); *Eremnophila opulenta* (Guérin-Méneville, 1838); *Penepodium egregium* (Saussure, 1867); *Penepodium luteipenne* (Fabricius, 1804); *Penepodium spretum* (Kohl, 1902); *Podium angustifrons* Kohl, 1902; *Isodontia costipennis* (Spinola, 1851) e *Spheg ichneumoneus* (Linnaeus, 1758). Além destas, um registro de ocorrência baseado exclusivamente em literatura foi considerado, totalizando 24 espécies registradas para o Espírito Santo.

**Palavras-chave:** vespas solitárias, himenópteros aculeados, Mata Atlântica, distribuição geográfica.

**ABSTRACT:** An inventory of species of sphecid wasps of the Espírito Santo State is provided, based on the examination of entomological collections of five great public Brazilian institutions. There were identified 110 specimens of Sphecidae proceeding from Espírito Santo State, including 23 species, from which nine are new records to the state, not previously cited in the literature: *Ammophila gracilis* Lepeletier, 1845; *Eremnophila binodis* (Fabricius, 1798); *Eremnophila opulenta* (Guérin-Méneville, 1838); *Penepodium luteipenne* (Fabricius, 1804); *Penepodium egregium* (Saussure, 1867); *Penepodium spretum* (Kohl, 1902); *Podium angustifrons* Kohl, 1902; *Isodontia costipennis*

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(Spinola, 1851) and *Sphex ichneumoneus* (Linnaeus, 1758). Besides, one occurrence record based exclusively on literature was considered, totalizing 24 species recorded to the Espírito Santo.

**Key words:** solitary wasps, aculeate hymenopterous, Atlantic Forest, geographic distribution.

## Introduction

Sphecidae is a worldwide distributed family of solitary wasps, currently with 19 genera and 724 species recognized (Pulawski, 2013a), that presents complex and diverse behavioral patterns (Bohart & Menke, 1976). Amarante (2002; 2005) catalogued the sphecid species in the Neotropical Region, including approximately 100 species in Brazil. Despite the fact that sphecid wasps are conspicuous elements of the Neotropical fauna of Hymenoptera, there are few studies about the distribution, biology and taxonomy of the Brazilian species.

With 46,096 Km<sup>2</sup> of territorial area, the Espírito Santo State is located in Southeast Region of Brazil (Instituto Brasileiro de Geografia e Estatística, 2013) and is entirely included in the Atlantic Forest biome, presenting extensive preserved areas of native forest (Instituto Estadual do Meio Ambiente e Recursos Hídricos, 2013a; b). A variety of vegetation types is found in this state, as dense ombrophilous forest, semideciduous stationary forest, coastal sand plain vegetation (restinga), mangroves and swamps, with a notorious high biodiversity in some areas (e.g. Mendes & Padovan, 2000).

The purpose of the present paper is to contribute to the knowledge of the entomofauna of Espírito Santo State and to incentive future entomological studies in the region, presenting an inventory of Sphecidae species.

## Material and Methods

The inventory presented in this paper gather information found in the literature and from the examination of the material deposited in five important entomological collections of Brazilian public institutions: (1) Museu de Biologia Professor Mello Leitão (MBML), Santa Teresa, ES, (2) Coleção Entomológica do Instituto Oswaldo Cruz (CEIOC), Rio de Janeiro, RJ, (3) Museu Nacional – Universidade Federal do Rio de Janeiro (MNRJ), Rio de Janeiro, RJ, (4) Coleção Costa Lima of the Universidade Federal Rural do Rio de Janeiro (UFRRJ), Seropédica, RJ, (5) Museu de Zoologia – Universidade de São Paulo (MZUSP), São Paulo, SP. The identification of the

species was based especially on the papers by Willink (1951), Menke (1964; 2004), van der Vecht & van Breugel (1968) and Vardy (1978). Specimens that do not perfectly match with the descriptions of the literature pertinent were not listed.

## Results

A total of 110 specimens was identified, including 10 genera and 23 species. No specimens from Espírito Santo State were found in the collection of the Universidade Federal Rural do Rio de Janeiro. The species found and examined material were listed and commented below.

### Subfamily Ammophilinae

#### Genus *Ammophila* Kirby, 1798

##### *Ammophila gracilis* Lepeletier, 1845

**Records.** ESPÍRITO SANTO STATE: Baixo Guandu, 2 female, VII.1971, P. C. Elias (MZUSP); Baixo Guandu, 2 females, X.1971, P. C. Elias (MZUSP); Conceição da Barra, 1 male, XI.1971, P. C. Elias (MZUSP); Linhares, 2 females, XI.1979, P. C. Elias (MZUSP); Santa Teresa, 1 female, XII.1946, R. Arlé (MNRJ); Santa Teresa (São João de Petrópolis), 1 male, IV.1954, P. A. Teles (MNRJ); São Mateus, 2 males, IV.1972, P. C. Elias (MZUSP).

**Remarks.** Amarante (2002) cited this species in Brazil to the States of Ceará, Mato Grosso do Sul, Maranhão, Pará, São Paulo and Rio de Janeiro. Herein the occurrence of this species is recorded to the Espírito Santo State.

#### Genus *Eremnophila* Menke, 1964

##### *Eremnophila binodis* (Fabricius, 1798)

**Records.** ESPÍRITO SANTO STATE: Santa Teresa (São João de Petrópolis), 1 male, IV.1954, P. A. Teles (MNRJ); Sooretama (Reserva Biológica de Sooretama), 1 male, III.1953, Pedro Almeida Teles (MNRJ).

**Remarks.** This is probably the commonest species of the genus in South America (Menke, 1964) and widely distributed in Brazil (Amarante, 2002), but herein it is recorded to the Espírito Santo State for the first time.

##### *Eremnophila eximia* (Lepeletier, 1845)

**Records.** ESPÍRITO SANTO STATE: Conceição da Barra, 1 female, 1 male, I.1979, P. C. Elias (MZUSP); Conceição da Barra, 1 female, 10-15.IV.1979, P. C. Elias (MZUSP); Linhares, 1 female, 2 male, XII.1972, P. C. Elias (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Eremnophila melanaria* (Dahlbom, 1843)

**Records.** ESPÍRITO SANTO STATE: Cariacica (Reserva Biológica de Duas Bocas), 1 female, 29.XII.1988 (MBML); Cariacica (Reserva Biológica de Duas Bocas), 1 female, 29.III.1987 (MBML); Santa Teresa (Museu de Biologia Professor Mello Leitão), 1 female, 25.X.1996, M. Hoffmann (MBML); Santa Teresa, 3 females, XII.1946, R. Arlé (MNRJ); Santa Teresa, 1 female, III.1964, C. T. Elias (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Eremnophila opulenta* (Guérin-Méneville, 1838)

**Records.** ESPÍRITO SANTO STATE: Colatina, 1 female, X.1969, F. M. Oliveira (MNRJ).

**Remarks.** This species is widely distributed in Brazil (Amarante, 2002), but herein its distribution is extended to the Espírito Santo State.

## Subfamily Sceliphrinae

## Tribe Podiini

Genus *Dynatus* Lepeletier, 1845*Dynatus nigrepes spinolae* (Lepeletier, 1845)

**Records.** ESPÍRITO SANTO STATE: Alegre (Fazenda Jerusalém), 1 female, 17.II.1912, J. F. Zikán (CEIOC); Alegre (Fazenda Jerusalém), 1 female, 06.I.1915, J. F. Zikán (CEIOC); Conceição da Barra, 1 female, I.1979, P. C. Elias (MZUSP); Itapemirim (Sete Pontas), 2 females, 24.III.1989, A. P. Aguiar (MBML); Linhares, 2 female, 2 males, V.1972, P. C. Elias (MZUSP); Linhares, 1 female, XII.1972, P. C. Elias (MZUSP); Linhares, 3 male, XI.1979, P. C. Elias (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

Genus *Penepodium* Menke, 1976*Penepodium fumipenne* (Taschenberg, 1869)

**Previous literature record.** Amarante (2002): Espírito Santo State.

**Remarks.** Although no specimen of *P. fumipenne* was examined, Amarante (2002) cited this species to Espírito Santo State and several other states from Brazil.

*Penepodium egregium* (Saussure, 1867)

**Records.** ESPÍRITO SANTO STATE: Linhares, III.1973, 1 male, P. C. Elias (MZUSP).

**Remarks.** This species is known only from Uruguay and Brazil, in the states of Minas Gerais and Rio Grande do Sul (Amarante, 2002). Herein its distribution

is extended to the Espírito Santo State (the specimens examined was previously identified by S.T.P. Amarante, who revised the genus *Penepodium*).

*Penepodium luteipenne* (Fabricius, 1804)

**Records.** ESPÍRITO SANTO STATE: Santa Teresa (Estação Biológica de Santa Lúcia), 2 females, III.2012, S. B. Buys (CEIOC).

**Remarks.** Sérgio Túlio Amarante<sup>†</sup>(personal communication) made a revisionary study of the genus *Penepodium* and believed that *P. luteipenne* is restrict to Amazon Forest and so specimens from Atlantic Forest has been erroneously identified with this name. However, the name *P. luteipenne* is used in the present paper, pending the publication of the aforementioned revisionary study of the genus.

*Penepodium spretum* (Kohl, 1902)

**Records.** ESPÍRITO SANTO STATE: Linhares (Reserva Biológica de Sooretama), 1 female (captured with Malaise trap), 24-27.III.2002, C. O. Azevedo with colleagues (MZUSP).

**Remarks.** This species was described from an unknown locality in Brazil (Pulawski, 2013b). Amarante (2002) cited this species to Rio de Janeiro State (Southeastern Brazil) and herein its distribution is extended to the Espírito Santo State (the specimens examined was previously identified by S.T.P. Amarante, who revised the genus *Penepodium*).

Genus *Podium* Fabricius, 1904

*Podium angustifrons* Kohl, 1902

**Records.** ESPÍRITO SANTO STATE: Santa Teresa (Estação Biológica de Santa Lúcia, 867m, 19°58'19.5"S 40°32'10.3W), 1 female (captured with Malaise trap), 9-12.IV.2001, C. O. Azevedo with colleagues (MZUSP).

**Remarks.** This species has been recorded in Brazil only from Amazonian region (Amarante, 2002), herein it is recorded to the Espírito Santo State and to Atlantic Forest for the first time.

*Podium trigonopsoides* Menke, 1974

**Records.** ESPÍRITO SANTO STATE: Alegre (Fazenda Jerusalém), 1 female, 10.XI.1912, J. F. Zikán (CEIOC) [the same specimen examined by Buys (2011b)].

**Previous literature record.** Buys (2011b): Espírito Santo State.

**Remarks.** This rare species, known only from a few specimens, was described to Santa Catarina State, Southern Brazil, (Menke, 1973) and further cited to Mar de Hespânia, in Minas Gerais, and to Fazenda Jerusalém, a so unknown

locality in Espírito Santo (Buys, 2011b), which now we know belonged to the city of Alegre.

Genus *Trigonopsis* Perty, 1833

*Trigonopsis rufiventris* (Fabricius, 1804)

**Records.** ESPÍRITO SANTO STATE: São Mateus, 1 female, IV.1972, P. C. Elias (MZUSP); Linhares (Reserva Biológica de Sooretama, 19°02'58.9"S 40°08'53.1"W), 1 female (captured with Moericke trap), 24-27.III.2002, C. O. Azevedo with colleagues (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Trigonopsis violascens* (Dalla Torre, 1897)

**Records.** ESPÍRITO SANTO STATE: Cariacica (Reserva Biológica de Duas Bocas), 1 female, 15.X.1988, A. P. Aguiar (MBML); Conceição da Barra, 1 female, VII.1971, P. C. Elias (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

Tribe Sceliphirini

Genus *Sceliphron* Klug, 1801

*Sceliphron fistularium* (Dahlbom, 1843)

**Records.** ESPÍRITO SANTO STATE: Alegre (Fazenda Jerusalém), 1 female, 01.II.1914, J. F. Zikán (CEIOC); Cariacica (Reserva Biológica de Duas Bocas, secondary forest), 1 female, 27.XII.1987, A. P. Aguiar (MBML); Linhares, 1 female, XII.1972, P. C. Elias (MZUSP); Linhares, 1 female, XII.1946, R. Arlé (MNRJ); Sooretama (Reserva Biológica de Sooretama, Cupido), 3 females, II/III.1948, L. Trav. Freitas & H. Trav. (CEIOC); Sooretama (Reserva Biológica de Sooretama), 4 females, III.1953, P. A. Teles (MNRJ); Sooretama (Reserva Biológica de Sooretama), 1 female, III.1953, P. A. Teles (MNRJ).

**Previous literature record.** Amarante (2002): Espírito Santo State.

Subfamily Sphecinae

Tribe Prionychini

Genus *Prionyx* Vander Linden, 1827

*Prionyx chilensis* (Spinola, 1851)

**Record.** Linhares, 1 female, (illegible date), P. C. Elias (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Prionyx fervens* (Linnaeus, 1758)

**Records.** ESPÍRITO SANTO STATE: Serra (Mestre Álvaro), 1 female, 19.IV.1987, A. P. Aguiar (MBML); Linhares, 1 female, XI.1979, P. C. Elias (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Prionyx thomae* (Fabricius, 1775)

**Records.** ESPÍRITO SANTO STATE: Baixo Guandu, 6 females, X.1971, P. C. Elias (MZUSP); Linhares, 1 female, 10.1973, P. C. Elias (MZUSP); Santa Teresa (São João de Petrópolis), 1 female, III.1955, P. Teles & F. Oliveira (MNRJ); Santa Teresa (São João de Petrópolis), 1 female, 6 males, IV.1954, P. Teles & F. Oliveira (MNRJ); Vila Velha (Jacarenema, restinga vegetation), 2 females, 30.IV.1989, A. P. Aguiar (MBML); Vila Velha (Barra do Jucu, Jacarenema, restinga vegetation), 1 female, III.1986 (MBML).

**Previous literature record.** Amarante (2002): Espírito Santo State.

Tribe Sphecini

Genus *Isodontia*

*Isodontia costipennis* (Spinola, 1851)

**Records.** ESPÍRITO SANTO STATE: Baixo Guandu, 2 females, X.1971, P. C. Elias (MZUSP).

**Remarks.** This species was cited in Brazil to states Amapá, Amazonas, Mato Grosso (Amarante, 2002) and Rio de Janeiro (Buys, 2009; 2011a). Herein its distribution is extended to Espírito Santo State.

Genus *Sphex* Linnaeus, 1758

*Sphex calliginosus* Erichson, 1849

**Records.** ESPÍRITO SANTO STATE: Baixo Guandu, 1 male, X.1971, P. C. Elias (MZUSP); Linhares, 1 female, XI.1979, P. C. Elias (MZUSP); Santa Teresa (Estação Biológica de Santa Lúcia), 1 female, III.2009, S. C. Buys (CEIOC); Santa Teresa (Museu de Biologia Mello Leitão), 19.II.1989, A. P. Aguiar (MBML); Santa Teresa, 1 female, XII.1965, Antonio Paviote (MNRJ).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Sphex ichneumoneus* (Linnaeus, 1758)

**Records.** ESPÍRITO SANTO STATE: Santa Teresa (Estação Biológica de Santa Lúcia), 2 females, 12.XI.2007, S. C. Buys (CEIOC).

**Remarks.** This species is widely distributed in South, Central and North America (*e.g.* Willink, 1951; Amarante, 2002), but herein it is cited for the first time to Espírito Santo State.

*Sphex ingens* F. Smith, 1856

**Records.** ESPÍRITO SANTO STATE: Conceição da Barra, 1 female, I.1979, P. C. Elias (MZUSP); Guarapari, 1 female, 16.I.1964, Exp. Coz. (MZUSP); Linhares,

1 female, V.1972, P. C. Elias (MZUSP); Linhares, 1 female, XII.1972. P. C. Elias (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Sphex opacus* Dahlbom, 1845

**Records.** ESPÍRITO SANTO STATE: Conceição da Barra, 1 female, 1 male, 10-15. IV.1968, P. C. Elias (MZUSP); Itaguassu, 1 male, VII.1971, P. C. Elias (MZUSP); Linhares, 1 female, XI.1979, P. C. Elias (MZUSP); Santa Teresa, 1 female, XII.1945, R. Arlé (MBML); Santa Teresa (São João de Petrópolis), 2 females, 1 male, III.1955, P. Teles & F. Oliveira (MNRJ); Santa Teresa, 1 female, 4 males, XII.1946, R. Arlé (MNRJ).

**Previous literature record.** Amarante (2002): Espírito Santo State.

*Sphex nitidiventris* Spinola, 1851

**Record.** ESPÍRITO SANTO STATE: Conceição da Barra, 1 female, XII.1968, P. Cesar (MZUSP).

**Previous literature record.** Amarante (2002): Espírito Santo State.

## Discussion

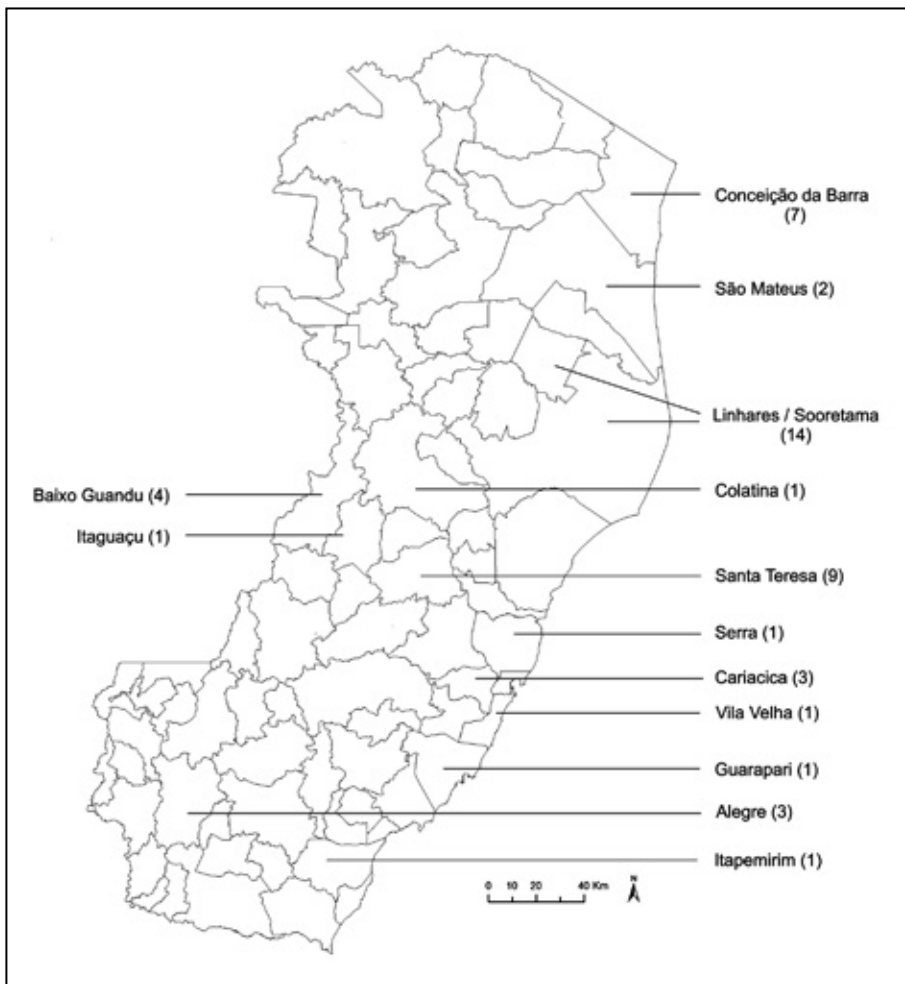
Amarante (2002) cited 14 species of Sphecidae occurring in Espírito Santo State and later Buys (2011b) cited the occurrence of one more species. Herein nine new occurrences records are added: *Ammophila gracilis* Lepeletier, 1845; *Eremnophila binodis* (Fabricius, 1798); *Eremnophila opulenta* (Guérin-Méneville, 1838); *Podium angustifrons* Kohl, 1902; *Penepodium egregium* (Saussure, 1867); *Penepodium luteipenne* (Fabricius, 1804); *Penepodium spretum* (Kohl, 1902); *Isodontia costipennis* (Spinola, 1851) and *Sphex ichneumoneus* (Linnaeus, 1758), with a total of 24 species now recorded to the state.

The cities of Linhares and Sooretama, in the Rio Doce Region, and city of Santa Teresa, in Central Mountain Region, have a greater number of species records (Fig. 1). These cities possess extensive areas of Atlantic Forest, currently protected (see Instituto Estadual de Meio Ambiente e Recursos Hídricos, 2013a).

Some other states of the Southeast Region of Brazil have more records of sphecids occurrence than Espírito Santo State. Amarante (2002) cited 39 species in São Paulo State and Buys (2009, 2011a) listed 30 species in Rio de Janeiro State, being the occurrence of at least 48 species of Sphecidae recorded in the Southeast Region of Brazil (see Amarante 2002; 2005; Buys, 2011a; b). However, the smaller number of species recorded in Espírito Santo State seems



to be more related with a lack of tradition of studies on Aculeate Hymenoptera in this state, and consequently a smaller number of expeditions for collection, than a lower regional biodiversity. On the contrary, some remnant forests in Espírito Santo State have revealed a higher biodiversity in some groups of insects (*e.g.* Brown, 2000; Salles *et al.* 2010), vertebrate (*e.g.* Passamani *et al.*, 2000; Simon, 2000) and trees (*e.g.* Thomaz & Monteiro, 1997) than other areas of Atlantic Forest. Therefore, the expectative is that further studies will reveal much more sphecid species in Espírito Santo State.



**Figure 1.** Espírito Santo State, showing the cities where sphecid wasps were recorded. In parenthesis the number of species recorded in each city.

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