

Checklist of the genera of Hymenoptera (Insecta) from Espírito Santo state, Brazil

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RESUMO: Lista de gêneros de Hymenoptera (Insecta) do Espírito Santo, Brasil. É apresentada uma lista dos gêneros de Hymenoptera do Espírito Santo, Brasil pela primeira vez. Foram listados 973 gêneros de Hymenoptera, dos quais

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Recebido: 03 dez 2014 – Aceito: 19 mai 2015

555 (57%) são citados pela primeira vez para o estado. As duas superfamílias com o maior número de gêneros foram Ichneumonoidea e Chalcidoidea com 241 e 203 gêneros respectivamente. Braconidae foram a família mais rica com 141 gêneros.

Palavras-chave. Biodiversidade, entomofauna, Mata Atlântica, primeiras citações, riqueza de gêneros.

ABSTRACT: The first checklist of genera of Hymenoptera from Espírito Santo state, Brazil is presented. A total of 973 genera of Hymenoptera is listed, of which 555 (57%) are recorded for the first time from this state. Ichneumonoidea and Chalcidoidea are the two superfamilies with the most genera, 241 and 203 respectively. Braconidae, with 141 genera, are the richest family.

Key words. Biodiversity, entomofauna, Atlantic forest, first records, genus richness.

Introduction

The insect order Hymenoptera is one of the dominant life forms on Earth, both in terms of number of species and in the diversity of life styles (Austin & Dowton 2000).

Hymenoptera have traditionally been divided into two suborders, “Symphyta” (sawflies) and Apocrita, with the latter subdivided into “Parasitica” (parasitoids) and Aculeata (stinging wasps, bees, and ants) (Sharkey *et al.*, 2011). Symphyta and Parasitica have been demonstrated to be paraphyletic, whereas Aculeata are monophyletic (Heraty *et al.*, 2011; Sharkey *et al.*, 2011).

The Hymenoptera are one of most speciose orders of insects, potentially surpassing the Coleoptera (Grissell, 1999; New, 2012). There are about 150,000 valid species (Huber, 2009; Aguiar *et al.*, 2013), but there are estimates of between 600,000 and 1,200,000 extant species (Grimaldi & Engel, 2005; Sharkey, 2007).

The state of Espírito Santo lies within the Atlantic forest phytogeographic domain (Lani *et al.*, 2008) and has Atlantic rain forest (hillside and flatland), Mangrove forest and Restinga coastal vegetation.

The fauna of Hymenoptera from the Brazilian state of Espírito Santo has been poorly studied. Most previous studies of this order deal with Apidae, Bethyidae, Chalcididae, and Ichneumonidae, which are focal organisms of the staff of local institutions, besides a few published surveys of Hymenoptera families for select localities (e.g. Alencar *et al.*, 2007; Azevedo & Santos 2000; Azevedo *et al.*, 2002; Azevedo *et al.*, 2003). Thus the primary goal of

the present study is to provide the first checklist of the genera of Hymenoptera from Espírito Santo, Brazil.

Materials and methods

This paper is a result of an initiative of the project “N.E.S.H. – Nucleus of Excellence in Systematic of Hymenoptera: broadening agricultural and environmental frontiers of Espírito Santo” which was carried out under coordination of the first author and supported by FAPES (the State Science Foundation).

Under this initiative about 140,000 specimens of Hymenoptera from Espírito Santo were mounted between 2011 and 2013 and deposited at UFES Insect Collection. The great majority of these specimens were collected using Malaise trap. The minority of the material was collected using other methods of collection such entomological nets and yellow pan trap. Most of the material comes from areas of Atlantic rain forests, but few specimens were collected in Mangrove forests and Restinga coastal vegetation.

A collective effort was made for the authors to visit the UFES insect collection in Vitória, the capital of the state, during a five-week workshop in 2013 to identify the material under their expertise. To elaborate the checklist we also included generic citations available from literature.

All images were prepared by Ricardo Kawada. They were taken with a Leica DFC 495 video camera attached to a Leica Z16 APO with a Planapo 1.0 or 2.0x objective lens. Figs 1-46 were produced from stacks of images that vertically transected the specimen using Leica LAS (Leica Application Suite V4.3.0) Microsystems by Leica (Switzerland) Limited. These were combined automatically into a single image using Helicon Focus (version 6.0.18), based on Method C (Pyramid) and focus autoadjustments 1% (horizontally).

The sequence of the genera in the list follows the traditional way presented in several handbooks of Hymenoptera with Symphyta, then Parasitica and finally Aculeata. An asterisk after the authorship in the checklist indicates that the genus is recorded for the first time from Espírito Santo.

Results

A total of 973 genera of Hymenoptera, belonging to 48 families, were identified (Table 1); 555 (57%) of the genera are recorded for the first time from the Brazilian state of Espírito Santo (Table 1).

Table 1. Number of genera of Hymenoptera from Espírito Santo state, Brazil (by family).

Upper group	Superfamily	Family	number of genera
“Symphyta”	Tenthredinoidea	Argidae	12
		Cimbicidae	1
		Pergidae	12
		Tenthredinidae	8
	Xiphydriidea	Xiphydriidae	1
“Parasitica”	Stephanoidea	Stephanidae	1
	Ichneumonoidea	Braconidae	141
		Ichneumonidae	100
	Trigonaloidea	Trigonalidae	1
	Cynipoidea	Figitidae	36
		Ibaliidae	1
		Liopteridae	2
	Evanioidea	Aulacidae	2
		Evaniidae	6
		Gasteruptionidae	1
	Diaprioidea	Diapriidae	28
		Ismaridae	1
		Monomachidae	1
	Ceraphronoidea	Ceraphronidae	3
		Megaspilidae	2
	Platygastridea	Platygastridae	54
	Proctotrupoidea	Heloridae	1
		Pelecniidae	1
		Proctotrupidae	1
	Mymarommatoidea	Mymaromatidae	3
	Chalcidoidea	Agaonidae	4
		Aphelinidae	2
		Chalcididae	15
		Encyrtidae	38

Table 1 (cont.)

Upper group	Superfamily	Family	number of genera
		Eucharitidae	4
		Eulophidae	35
		Eupelmidae	16
		Eurytomidae	3
		Leucospidae	1
		Mymaridae	22
		Perilampidae	1
		Pteromalidae	51
		Signiphoridae	2
		Tanaostigmatidae	2
		Torymidae	5
		Trichogrammatidae	2
Aculeata	Chrysidoidea	Bethylidae	17
		Chrysididae	10
		Dryinidae	9
		Embolemidae	1
		Sclerogibbidae	1
		Scolebythidae	1
	Vespoidea	Formicidae	66
		Mutillidae	19
		Pompilidae	28
		Rhopalosomatidae	3
		Scoliidae	1
		Tiphiidae	13
		Vespidae	21
	Apoidea	Ampulicidae	2
		Crabronidae	51
		Sphecidae	10
		Apidae	97

“SYMPHYTA”

Tenthredinoidea, Argidae

Acrogymnia Malaise, 1937*
Atomacera Say, 1836*
Didymia Lepeletier & Serville, 1828
Dieloceros Curtis, 1844
Durgoa Malaise, 1937
Eriglenum Konow, 1901
Hemidianeura Kirby, 1872
Manaos Rohwer, 1912*
Neurogymnia Malaise, 1937* (Figura 1)
Ptilia Lepeletier, 1823
Scobina Lepeletier & Serville, 1828
Sericoceros Konow, 1905

Tenthredinoidea, Cimbicidae

Pachylosticta Malaise, 1937*

Tenthredinoidea, Pergidae

Acordulecera Malaise, 1937*
Acorduloceridea Say, 1836*
Anathulea Lepeletier & Serville, 1828 (Figura 2)
Aulacomerus Curtis, 1844
Camptoprium Malaise, 1937
Decameria Konow, 1901

Haplostegus Kirby, 1872
Heteroperreyia Rohwer, 1912*
Lagideus Malaise, 1937*
Perreyia Lepeletier, 1823
Perreyiella Lepeletier & Serville, 1828
Quetutus Konow, 1905

Tenthredinoidea, Tenthredinidae

Acidiophora Malaise, 1937*
Adiaclema Say, 1836*
Andeana Lepeletier & Serville, 1828
Dochmioglene Curtis, 1844
Plaumanniana Malaise, 1937
Pristiphora Konow, 1901
Probleta Kirby, 1872
Waldheimia Rohwer, 1912*

Xiphydrioidae, Xiphydriidae

Derecyrta Smith, 1860

“PARASITICA”

Stephanoidea, Stephanidae

Hemistephanus Enderlein, 1905

Ichneumonoidea, Braconidae

Acanthorhogas Szépligeti, 1906*



Figura 1. Argidae, *Neurogymnia* Malaise, 1937



Figura 2. Pergidae, *Anathulea* Lepeletier & Serville, 1828

Exis Mason, 1981*
Lissodoryctes Marsh, 2002*
Alabagrus Enderlein, 1920
Aleiodes Wesmael, 1838
Allobracoon Gahan, 1915
Allorhogas Gahan, 1912*
Alphomelon Mason, 1981
Amputoearinus Sharkey, 2006*
Andesipolis Whitfield & Choi, 2004*
Apanteles Förster, 1862*
Aphaereta Förster, 1862
Aphelopsia Marsh, 1993*
Aphidius Nees, 1818*
Araucania Marsh, 1993*
Aridelus Marshall, 1887*
Ascogaster Wesmael, 1835*
Asobara Förster, 1862*
Aspilodemon Fischer, 1966*
Aspilota Förster, 1862*
Austroearinus Sharkey, 2006*
Austrozele Roman, 1910
Barbalhoa Marsh, 2002*
Blacozona van Achterberg, 1988*
Blacus Nees, 1818*
Bracon Fabricius, 1804
Callihormius Ashmead, 1900*
Capitonius Brullé, 1846
Cardiochiles Nees, 1819*
Centistidea Rohwer, 1914*
Chelonus Panzer, 1806*
Choeras Mason, 1981*
Choreborogas Whitfield, 1980*
Chrysopophthorus Goidanach, 1948*
Clinocentrus Haliday, 1833*
Coiba Marsh, 1993*
Compsobracon Ashmead, 1900*
Concortisella Roman, 1924*
Cotesia Cameron, 1891
Curtisella Spinola, 1853*

Cystomastax Szépligeti, 1904*
Dasylogon Muesebeck, 1958*
Dentigaster Zettel, 1990*
Diaeretiella Starý, 1960
Digonogastra Viereck, 1912
Dinotrema Förster, 1862*
Diolcogaster Ashmead, 1900*
Diospilus Haliday, 1833* (Figura 3)
Distatrix Mason, 1981*
Dolichozele Viereck, 1911*
Doryctinus Roman, 1910*
Doryctobracon Enderlein, 1920
Ecphylyus Förster, 1862*
Eubazus Nees, 1814*
Euphoriella Ashmead, 1900*
Exasticolus van Achterberg, 1979*
Fornicia Brullé, 1846*
Fritziella Marsh, 1993*
Glyptapanteles Ashmead, 1904*
Glyptocolastes Ashmead, 1900*
Gnamptodon Haliday, 1833*
Gnathopleura Fischer, 1975
Hebichneutes Sharkey & Wharton, 1994
Helcon Nees, 1814*



Figura 3. Braconidae, *Diospilus* Haliday, 1833

- Helconichia* Sharkey & Wharton, 1994
Heredius Marsh, 2002*
Heterospathius Barbalho & Penteado-Dias, 1999*
Heterospilus Haliday, 1836
Hormius Nees, 1818*
Hydrangeocola Brèthes, 1927*
Hymenochaonia Dalla Torre, 1898*
Hypomicrogaster Ashmead, 1898*
Idiasta Förster, 1862
Johnsonius Marsh, 1993
Labania Hedqvist, 1963*
Larissimus Nixon, 1965*
Lecythodella Enderlein, 1912*
Leiophron Nees, 1818*
Leluthia Cameron, 1887*
Leptodrepana Shaw, 1983*
Litostolus van Achterberg, 1985*
Lysiphlebus Förster, 1862*
Lytopylus Viereck, 1905*
Macrocentrus Curtis, 1833*
Macrostomion Szépligeti, 1900*
Mariapanteles Whitfield & Fernández-Triana, 2012*
Marshiella Shaw, 1985*
Masonbeckia Sharkey & Wharton, 1994*
Mendesella Whitfield & Mason, 1994*
Meteorus Haliday, 1835*
Microcrasis Fischer, 1975*
Microctonus Wesmael, 1835*
Microplitis Förster, 1862*
Monarea Szépligeti, 1904
Monitoriella Hedqvist, 1963
Mononeuron Fischer, 1981*
Nealiolus Mason, 1974*
Notiospathius Matthews & Marsh, 1973
Oligoneurus Szépligeti, 1902*
Opius Wesmael, 1835
Orgilus Haliday, 1833*
Pambolus Haliday, 1836*
Papanteles Mason, 1981*
Paroligoneurus Muesebeck, 1931*
Pedinotus Szépligeti, 1902*
Peristenus Förster, 1862*
Phaenocarpa Förster, 1862
Phanerotoma Wesmael, 1838*
Pholetesor Mason, 1981*
Pioscelus Muesebeck & Walkley, 1951*
Plynops Shaw, 1996*
Podorgilus van Achterberg, 1994
Prasmodon Nixon, 1965*
Promicrogaster Brues & Richardson, 1913*
Protapanteles Ashmead, 1898*
Proterops Wesmael, 1835*
Psenobolus Reinhard, 1885
Pseudapanteles Ashmead, 1898*
Pseudognaptodon Fischer, 1964*
Pseudophanerotoma Zettel, 1990*
Pseudorhysipolis Scatolini, Penteado-Dias & van Achterberg, 2002*
Rasivalva Mason, 1981*
Rhysipolis Förster, 1862*
Rinamba Cameron, 1912*
Rogas Nees, 1818*
Sacirema Quicke, 1995*
Semirhytus Szépligeti, 1902*
Sendaphne Nixon, 1965*
Stantonia Ashmead, 1904*
Stiropius Cameron, 1911*
Syntretus Förster, 1862*
Therophilus Wesmael, 1837*
Topaldios Papp, 1995*
Triaspis Haliday, 1835*

Trigonophasmus Enderlein, 1912*
Urosigalphus Ashmead, 1889*
Utetes Förster, 1862*
Waitaca Marsh, 1993
Xanthomicrogaster Cameron, 1911*
Zamicrodus Viereck, 1912*
Zelomorpha Viereck, 1912

Ichneumonoidea, Ichneumonidae

Acerastes Cushman, 1929
Acorystus Townes, 1970
Acrotaphus Townes, 1960
Agrypon Förster, 1860*
Allophris Förster, 1868*
Aneucelis Förster, 1868*
Anomalon Panzer, 1804
Apechoneura Kriechbaumer, 1890
Barycnemis Förster, 1868*
Bathyzonus Townes, 1970
Bicryptella Strand, 1917
Boethella Bennett, 2003
Brachycyrtus Kriechbaumer, 1880*
Calliephialtes Ashmead, 1900
Campoplex Gravenhorst, 1829*
Casinaria Holmgren, 1859*
Charops Holmgren, 1859*
Clistopyga Gravenhorst, 1829*
 (Figura 4)
Colpotrochia Holmgren, 1855
Creagura Townes, 1971*
Cryptanura Brullé, 1846
Cryptophion Viereck, 1913*
Cubus Townes, 1959*
Cymodusa Holmgren, 1859*
Debilos Townes, 1966
Diaparsis Förster, 1868*
Digonocryptus Viereck, 1913
Dimophora Förster, 1869*
Diradops Townes, 1946*
Distictus Townes, 1966

Dolichomitus Smith, 1877*
Dusona Cameron, 1900
Eiphosoma Cresson, 1865
Eknomia Santos & Aguiar, 2012
Enicospilus Stephens, 1835
Epirhyssa Cresson, 1865*
Eruga Townes, 1960*
Eutanygaster Cameron, 1911*
Exetastes Gravenhorst, 1829*
Ganodes Townes, 1957*
Golbachella Townes, 1970
Grotea Cresson, 1864*
Hapsinotus Townes, 1970*
Hymenopimecis Viereck, 1912
Joppa Fabricius, 1804
Joppidium Walsh, 1873
Labena Cresson, 1864*
Lagarosoma Gupta & Gupta, 1984
Lamprocryptus Schmiedeknecht, 1904
Latosculum Townes, 1966
Leurus Townes, 1946*
Limonethe Townes, 1946
Loxopus Townes, 1970
Lycorina Holmgren, 1859*
Macrojoppa Kriechbaumer, 1898



Figura 4. Ichneumonidae, *Clistopyga* Gravenhorst, 1829

Meggoleus Townes, 1971*
Melanocryptus Cameron, 1902
Meniscomorpha Schmiedeknecht, 1907
Mesochorus Gravenhorst, 1829
Messatoporus Cushman, 1929
Metopius Panzer, 1806*
Neotheronia Krieger, 1899*
Netelia Gray, 1860
Nonnus Cresson, 1874
Occia Tosquinet, 1903*
Oedemopsis Tschek, 1869*
Ophion Fabricius, 1798
Ophiopterus Brullé, 1846*
Orthocentrus Gravenhorst, 1829*
Oxytorus Förster, 1869
Petila Tedesco & Aguiar, 2009
Phradis Förster, 1868*
Pimpla Fahrilles, 1804*
Podogaster Brullé, 1846*
Polycyrtidea Viereck, 1913
Polyphrix Townes, 1970
Polysphincta Gravenhorst, 1829*
Priotomis Townes, 1970
Pristomerus Curtis, 1836*
Probles Förster, 1868*
Prosthoporus Porter, 1977
Rhinium Townes, 1966
Sphingozona Townes, 1971*
Stethantyx Townes, 1971*
Syzeuctus Förster, 1868*
Temelucha Förster, 1869*
Thymebatis Brèthes, 1909
Thyreodon Brullé, 1846
Ticapimpla Gauld, 1991*
Toechorychus Townes, 1946
Trathala Cameron, 1899*
Triece Townes, 1946*
Woldstedtius Carlson, 1979*
Xanthopimpla Saussure, 1892*

Xiphosomella Szépligeti, 1905*
Xorides Latreille, 1809*
Zaglyptus Foster, 1869*
Zagryphus Cushman, 1919*
Zatypota Förster, 1869*
Zonopimpla Ashmead, 1900*

Trigonalioidea, Trigonalidae

Taeniogonalos Schulz, 1906*
 (Figura 5)

Cynipoidea, Figitidae

Acanthaegilips Ashmead, 1897*
Acantheucoila Ashmead, 1900*
Aganaspis Lin, 1988*
Agrostocynipis Diaz, 1976*
Alloxysta Förster, 1869*
Anacharis Dalman, 1823*
Angustocorpa Quinlan, 1988*
Apocharips Fergusson, 1988*
Aspicera Dahlbom, 1842*
Chrestosema Förster, 1869*
Dettmeria Borgmeier, 1935*
Dicerataspis Ashmead, 1896*
Didyctium Riley, 1880*
Dieucoila Ashmead, 1903*



Figura 5. Trigonalidae, *Taeniogonalos* Schulz, 1906

Endecameris Yoshimoto, 1963*
Figites Latreille, 1802*
Ganaspis Förster, 1869*
Gronotoma Förster, 1869*
Hexacola Förster, 1869*
Kleidotoma Westwood, 1833*
Leptolamina Yoshimoto, 1962*
Leptopilina Förster, 1869* (Figura 6)
Marthiella Buffington, 2009*
Micrerioides Yoshimoto, 1962*
Neralsia Cameron, 1833*
Odontoecuila Ashmead, 1903
Odontosema Kieffer, 1909*
Preseucoela Buffington, 2004*
Rhabdeucoela Kieffer, 1907*
Rhoptromeris Förster, 1869*
Steleucoela Kieffer, 1908
Striatovertex Schick & Forshage, 2011*
Thoreauella Girault, 1930*
Triplasta Kieffer, 1901*
Tropideucoila Ashmead, 1903*
Zaeucoila Ashmead, 1903*

Cynipoidea, Ibaliidae

Ibalia Latreille, 1802*

Cynipoidea, Liopteridae

Liopterion Perty, 1833* (Figura 7)

Pseudibalia Kieffer, 1911*

Evanioidea, Aulacidae

Aulacus Jurine, 1807* (Figura 8)

Pristaulacus Kieffer, 1900

Evanioidea, Evaniidae

Alobevania Kawada & Deans, 2008*

Evania Fabricius, 1775

Evaniella Bradley, 1905

Evaniscus Szépligeti, 1903*



Figura 6. Figitidae, *Leptopilina* Förster, 1869



Figura 7. Liopteridae, *Liopterion* Perty, 1833



Figura 8. Aulacidae, *Aulacus* Jurine, 1807

Hyptia Illiger, 1807

Semaemyia Bradley, 1908 (Figura 9)

Evanioidea, Gasteruptiidae

Gasteruption Latreille, 1796

(Figura 10)

Diaprioidea, Diapriidae

Acanthopria Ashmead, 1896*

(Figura 11)

Acidopsilus Kieffer, 1909*

Aclista Förster, 1856*

Basalys Westwood, 1833*

Belyta Jurine, 1807*

Camptopsilus Kieffer, 1908*

Coecopria Masner, 1969*

Coptera Say, 1836*

Dissoxylabis Kieffer, 1909*

Doddius Masner & Garcia, 2002*

Doliopria Kieffer, 1910*

Entomacis Förster, 1856*

Idiotypa Förster, 1856*

Leucopria Masner & Garcia, 2002*

Lyteba Thomson, 1858*

Megaplastopria Ashmead, 1903*

Mimopria Holgren, 1908*

Miota Förster, 1856*

Monoxylabis Kieffer, 1909*

Monoxylabis Kieffer, 1909*

Odontopsilus Kieffer, 1909*

Paramesius Westwood, 1832*

Pentapria Kieffer, 1905*

Prosilomma Kieffer, 1916*

Scorpioteleia Ashmead, 1897*

Spilomicrus Westwood, 1832*

Szelenyiopria Fabricius, 1974*

Tropidopsilus Kieffer, 1908*

Diaprioidea, Ismaridae

Ismarus Haliday, 1835*



Figura 9. Evaniidae, *Semaemyia* Bradley, 1908



Figura 10. Gasteruptiidae, *Gasteruption* Latreille, 1796



Figura 11. Diapriidae, *Acanthopria* Ashmead, 1896

Diaprioidea, Monomachidae

Monomachus Klug, 1841 (Figura 12)

Platygastroidea, Platygastriidae

Acanthoscelio Ashmead, 1893

Acerotella Masner, 1964

Allostemma Masner & Huggert, 1989

Allotropa Förster, 1856*

Amblyaspis Förster, 1856

Amitus Haldeman, 1850*

Baeus Haliday, 1833

Baryconus Förster, 1856

Calliscelio Ashmead, 1893

Calotelea Westwood, 1837

Chromoteleia Ashmead, 1893

Cremastobaeus Ashmead, 1893

Duta Nixon, 1933

Dyscritobaeus Perkins, 1910

Embidobia Ashmead, 1896*

Eumicrosoma Gahan, 1913*

Euxestonotus Fouts, 1925*

Fidiobia Ashmead, 1894

Gastrotrypes Brues, 1922

Gryon Haliday, 1833

Gryonoides Dodd, 1920*

Idris Förster, 1856

Inostemma Haliday, 1833*

Iphitrachelus Haliday, 1836

Isostasius Förster, 1856*

Leptacis Förster, 1856

Leptoteleia Kieffer, 1908

Macroteleia Westwood, 1835

Metanopedias Brues, 1910*

Odontacolus Kieffer, 1910

Oethecoctonus Ashmead, 1893

Opisthacantha Ashmead, 1893

Orseta Masner & Huggert, 1989*

Parabaeus Kieffer, 1910

Parascelio Dodd, 1920

Paridris Kieffer, 1908

Phanuromyia Dodd, 1914*

Phanuropsis Girault, 1916*

Piestopleura Förster, 1856*

Platygaster Latreille, 1809

Probaryconus Kieffer, 1908

Psilanteris Kieffer, 1916

Pyrgaspis Kozlov, 1967*

Scelio Latreille, 1805

Sceliomorpha Ashmead, 1893

Synopeas Förster, 1856

Telenomus Haliday, 1833

Thoronella Masner, 1972

Trichacis Förster, 1856

Trimorus Förster, 1856

Trissolcus Ashmead, 1893

Triteleia Kieffer, 1906

Tyrannoscelio Masner & Johnson, 2007 (Figura 13)



Figura 12. Monomachidae, *Monomachus* Klug, 184



Figura 13. Platygastriidae, *Tyrannoscelio* Masner & Johnson, 2007

Xenomerus Walker, 1836*

Proctotrupoidea, Heloridae

Helorus Ogloblin 1928*

Proctotrupoidea, Pelecinidae

Pelecinus Latreille, 1800 (Figura 14)

Proctotrupoidea, Proctotrupidae

Exallonyx Kieffer, 1904*

(Figura 15)

Ceraphronoidea, Ceraphronidae

Aphanogmus Thomson, 1858*



Figura 14. Pelecinidae, *Pelecinus* Latreille, 1800



Figura 15. Proctotrupidae, *Exallonyx* Kieffer, 1904

Ceraphron Jurine, 1807*

Synarsis Förster, 1878* (Figura 16)

Ceraphronoidea, Megaspilidae

Conostigmus Dahlbom, 1858*

Dendrocercus Ratzeburg, 1852*

(Figura 17)



Figura 16. Ceraphronidae, *Synarsis* Förster, 1878



Figura 17. Megaspilidae, *Dendrocercus* Ratzeburg, 1852

Mymarommatoidea,

Mymarommatidae

Mymaromella Girault, 1931

Mymaromma Girault, 1920

Palaeomymar Meunier, 1901

Chalcidoidea, Agaonidae

Aepocerus Mayr, 1885

Heterandrium Mayr, 1885

Idarnes Walker, 1843 (Figura 18)

Pegoscapus Cameron, 1906

Chalcidoidea, Aphelinidae

Encarsia Förster, 1878*

Punkaphytis Kim & Heraty, 2012*
(Figura 19)

Chalcidoidea, Chalcididae

Antrocephalus Kirby, 1883

Aspirrhina Kirby, 1883

Brachymeria Westwood, 1829

Ceyxia Girault, 1911

Conura Spinola, 1837 (Figura 20)

Dirhinus Dalman, 1818

Ecuada Boucek, 1992*

Epitranus Walker, 1834

Halsteadium Boucek, 1992

Haltichella Spinola, 1811

Hockeria Walker, 1834*

Melanosmicra Ashmead, 1904

Notaspidium Dalla Torre, 1897

Stypiura Kirby, 1883



Figura 19. Aphelinidae, *Punkaphytis* Kim & Heraty, 2012



Figura 18. Agaonidae, *Idarnes* Walker, 1843



Figura 20. Chalcididae, *Conura* Spinola, 1837

Zavoya Boucek, 1992

Chalcidoidea, Encyrtidae

Adelencyrtus Ashmead, 1900*
Aenasius Walker, 1846*
Agarwalencyrtus Hayat, 1981*
Anagyrus Howard, 1896
Anicetus Howard, 1896*
Aphycus Mayr, 1876*
Arrhenophagus Aurivillius, 1888*
Blastothrix Mayr, 1876*
Blepyrus Howard, 1898*
Brachyplatycerus De Santis, 1972*
Cerchysiella Girault, 1914
Cheiloneurus Westwood, 1833*
Coccidoctonus Crawford, 1912*
Coelopencyrtus Timberlake, 1919*
Comperia Gomes, 1942
Copidosoma Ratzeburg, 1844
Encyrtus Latreille, 1809
Hambletonia Compere, 1936*
Hemencyrtus Ashmead, 1900
Hexacladia Ashmead, 1891*
Homalopoda Howard, 1894*
Homalotylus Mayr, 1876*



Figura 21. Encyrtidae, *Metaphycus* Mercet, 1917

Meromyzobia Ashmead, 1900*
Metaphycus Mercet, 1917* (Figura 21)
Microterys Thomson, 1876*
Mira Schellenberg, 1803*
Mucrencyrtus Noyes, 1980*
Neastymachus Girault, 1915*
Ooencyrtus Ashmead, 1900*
Parablastothrix Mercet, 1917*
Prionomastix Mayr, 1876
Prochiloneurus Silvestri, 1915*
Protyndarichoides Noyes, 1980*
Psyllaephagus Ashmead, 1900*
Rhytidothorax Ashmead, 1900*
Shenahetia Noyes, 1980*
Syrphophagus Ashmead, 1900*
Tineophoctonus Ashmead, 1900*

Chalcidoidea, Eucharitidae

Isomerula Shipp, 1894
Kapala Cameron, 1884*
Lirata Cameron, 1884* (Figura 22)
Orasema Cameron, 1884*

Chalcidoidea, Eulophidae

Alveoplectrus Wijesekara & Schauff, 1997*



Figura 22. Eucharitidae, *Lirata* Cameron, 1884

Ametallon Ashmead, 1904*
Aoridus Yoshimoto, 1971*
Apleurotropis Girault, 1913
Aprostocetus Westwood, 1833*
Cabeza Hansson & LaSalle, 2003*
Chrysocharis Förster, 1856*
Closterocerus Westwood, 1833*
 (Figura 23)
Deutereulophus Schulz, 1906*
Diglyphus Walker, 1844*
Elachertus Spinola, 1811*
Elasmus Westwood, 1833*
Emersonella Girault, 1916*
Eriastichus LaSalle, 1994*
Euderus Haliday, 1844*
Euplectrus Westwood, 1832*
Galeopsomyia Girault, 1916*
Grotiusomyia Girault, 1917*
Hoplocrepis Ashmead, 1890*
Horismenus Walker, 1843*
Melittobia Westwood, 1848*
Ogmoelachertus Schauff, 2000*
Omphale Haliday, 1833*
Oxypracetus LaSalle, 1994*

Paracrias Ashmead, 1904*
Paraolinx Ashmead, 1894*
Pediobius Walker, 1846*
Perditorulus Hansson, 1996*
Phymastichus LaSalle, 1990*
Platyplectrus Ferrière, 1941*
Proacrias Ihering, 1914*
Pseudosecodes Girault & Dodd, 1915*
Tachinobia Boucek, 1977*
Tetrastichus Haliday, 1844*
Trichospilus Ferrière, 1930*

Chalcidoidea, Eupelmidae

Anastatus Motschulsky, 1859*
Arachnophaga Ashmead, 1896*
Australoodera Girault, 1922*
Brasema Cameron, 1884 (Figura 24)
Calosota Curtis, 1836*
Ecnomocephala Gibson, 1995*
Eupelmus Dalman, 1820*
Lecaniobius Ashmead, 1896*
Macreupelmus Ashmead, 1896*
Metapelma Westwood, 1835*
Omeganastatus Gibson, 1995*



Figura 23. Eulophidae, *Closterocerus* Westwood, 1833



Figura 24. Eupelmidae, *Brasema* Cameron, 1884

Oozetetes De Santis, 1970*
Phlebopenes Perty, 1833*
Psomizopelma Gibson, 1995*
Reikosiella Yoshimoto, 1969*
Zaischnopsis Ashmead, 1896*

Chalcidoidea, Eurytomidae

Bephrata Cameron, 1984

(Figura 25)

Khamul Gates, 2008

Rileya Ashmead, 1988



Figura 25. Eurytomidae, *Bephrata* Cameron, 1984

Chalcidoidea, Leucospidae

Leucospis Fabricius, 1775*

(Figura 26)

Chalcidoidea, Mymaridae

Acmopolynema Ogloblin, 1946*

(Figura 27)

Alaptus Westwood, 1839*

Anagroidea Girault, 1915*

Anagrus Haliday, 1833*

Arescon Walker, 1846*

Australomymar Girault, 1929*

Callodicopus Ogloblin, 1955*

Camptoptera Förster, 1856*

Camptopteroidea Viggiani, 1974*

Cleruchus Enock, 1909*

Erdosiella Soyka, 1956*

Erythmelus Enock, 1909*

Gonatocerus Nees, 1834*

Litus Haliday, 1833*

Myrmecomymar Yoshimoto, 1990*

Neomymar Carwford, 1913*

Neostethynium Ogloblin, 1964*

Omyomymar Schauff, 1983*

Polynema Haliday, 1833*

Schizophragma Ogloblin, 1949*

Stephanocampta Mathot, 1966*

Tetrapolynema Ogloblin, 1946*



Figura 26. Leucospidae, *Leucospis* Fabricius, 1775



Figura 27. Mymaridae, *Acmopolynema* Ogloblin, 1946

Chalcidoidea, Perilampidae

Perilampus Latreille, 1809 (Figura 28)

Chalcidoidea, Pteromalidae

Ablaxia Delucchi, 1957*

Acaenasis Girault, 1917*

Aepocerus Mayr, 1885*

Apsilocera Boucek, 1956*

Arachnopteromalus Gordh, 1976*

Asaphes Walker, 1834*

Bubekia Dalla Torre, 1897*

Callitula Spinola, 1811*

Catolaccus Thomson, 1878*

Chalcedectus Walker, 1852*

Chrysoglyphe Ashmead, 1894*

Cleonymus Latreille, 1809*

(Figura 29)

Dipara Walker, 1833*

Epipteromalus Ashmead, 1904*

Epistenia Westwood, 1832*

Erixestus Crawford, 1910*

Erotolepsia Howard, 1894*

Eurydinoteloides Girault, 1913*

Gastrancistrus Westwood, 1833*

Halticopteroides Girault, 1913*

Hedqvistia Gibson, 2003*

Herbertia Howard, 1894*

Heteroschema Gahan, 1919*

Holcaeus Thomson, 1878*

Jaliscoa Boucek, 1993*

Lelaps Walker, 1843*

Leptofoenus Smith, 1862*

Lycisca Spinola, 1840*

Lyrcus Walker, 1842*

Macroglenes Westwood, 1832*

Mauleus Graham, 1981*

Metastenus Walker, 1834*

Miristhma Boucek, 1993*

Nasonia Ashmead, 1904*

Neocatolaccus Ashmead, 1904*

Netomocera Boucek, 1954*

Notoglyptus Masi, 1917*

Ogloblinisca Hedqvist, 1968*

Pachycrepoides Ashmead, 1904*

Pachyneuron Walker, 1833*

Propodeia Boucek, 1993*

Proschizonotus Girault, 1928*

Protoepistenia Gibson, 2003*

Psilocera Walker, 1833*

Shedoepistenia Gibson, 2003*

Spalangia Latreille, 1805*

Systatis Walker, 1834*

Theocolax Westwood, 1832*

Toxeumella Girault, 1913*

Trichomalopsis Crawford, 1913*

Uniclypea Boucek, 1976*



Figura 28. Perilampidae, *Perilampus* Latreille, 1809



Figura 29. Pteromalidae, *Cleonymus* Latreille, 1809

Chalcidoidea, Signiphoridae*Signiphora* Ashmead, 1880**Thysanus* Walker, 1840***Chalcidoidea, Tanaostigmatidae***Tanaostigma* Howard, 1890 (Figura 30)*Tanaostigmodes* Ashmead, 1896***Chalcidoidea, Torymidae***Palmon* Dalman, 1825*Podagrion* Spinola, 1811**Torymoides* Walker, 1871*Torymus* Dalman, 1820**Zaglyptonotus* Crawford, 1914***Chalcidoidea, Trichogrammatidae***Oligosita* Walker, 1851* (Figura 31)*Trichogramma* Westwood, 1833**ACULEATA****Chrysidoidea, Bethylidae***Anisepyris* Kieffer, 1905*Apenesia* Westwood, 1874*Aspidepyris* Evans, 1964*Bakeriella* Kieffer, 1910*Cephalonomia* Westwood, 1833*Chlorepys* Kieffer, 1913*Dissomphalus* Ashmead, 1893*Epyris* Westwood, 1832*Goniozus* Förster, 1856*Holepyris* Kieffer, 1905*Laelius* Ashmead, 1893*Nothepyris* Evans, 1973*Prorops* Waterson, 1923*Prosierola* Kieffer, 1905*Pseudisobrachium* Kieffer, 1904
(Figura 32)*Sclerodermus* Latreille, 1809*Solepyris* Azevedo, 2006**Chrysidoidea, Chrysididae***Adelphe* Krombein, 1890**Amisega* Cameron, 1888**Caenochrysis* Kimsey & Bohart,
1981 (Figura 33)*Chrysis* Linnaeus, 1761**Cleptidea* Mocsáry, 1904

Figura 30. Tanaostigmatidae,
Tanaostigma Howard, 1890



Figura 31. Trichogrammatide, *Oligosita*
Walker, 1851

Exallopyga French, 1985*
Exochrysis Bohart, 1966*
Holophris Mocsáry, 1890*
Ipsiura Bohart, 1959*
Pleurochrysis Bohart, 1966*

Chrysidoidea, Dryinidae

Anteon Jurine, 1807*
Aphelopus Dalman, 1823
Bocchus Ashmead, 1893*
Crovettia Olmi, 1984
Deinodryinus Perkins, 1907
Dryinus Latreille, 1804*
Gonatopus Ljungh, 1810* (Figura 34)



Figura 32. Bethylinidae,
Pseudisobrachium Kieffer, 1904

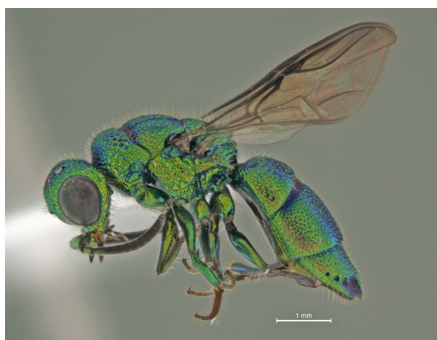


Figura 33. Chrysididae, *Caenochrysis*
 Kimsey & Bohart, 1981

Neodryinus Perkins, 1905
ThaumatoDryinus Perkins, 1905*

Chrysidoidea, Embolemidae

Embolemus Westwood, 1833
 (Figura 35)

Chrysidoidea, Sclerogibbidae

Probethylus Ashmead, 1902
 (Figura 36)



Figura 34. Dryinidae, *Gonatopus*
 Ljungh, 1810



Figura 35. Embolemidae, *Embolemus*
 Westwood, 1833

Chrysidoidea, Scolebythidae*Clystopsenella* Kieffer, 1911*

(Figura 37)

Vespoidea, Formicidae*Acanthognathus* Mayr, 1887*Acanthoponera* Mayr, 1862*Acanthostichus* Mayr, 1887**Acromyrmex* Mayr, 1865*Anochetus* Mayr, 1861*Apterostigma* Mayr, 1865*Atta* Fabricius, 1804*Azteca* Forel, 1878*Basiceros* Schulz, 1906*Brachymyrmex* Mayr, 1868*Camponotus* Mayr, 1861*Carebarella* Emery, 1906*Cephalotes* Latreille, 1802*Cerapachys* Smith, 1857**Crematogaster* Lund, 1831*Cryptomyrmex* Fernández, 2004*Cylindromyrmex* Mayr, 1870*

(Figura 38)

Cyphomyrmex Mayr, 1862*Dinoponera* Roger, 1861*Discothyrea* Roger, 1863*Dolichoderus* Lund, 1831*Dorymyrmex* Mayr, 1866*Eciton* Latreille, 1804*Ectatomma* Smith, 1858*Eurhopalothrix* Brown & Kempf,
1961*Gnamptogenys* Roger, 1863*Heteroponera* Mayr, 1887*Hylomyrma* Forel, 1912*Hypoponera* Santschi, 1938

Figura 36. Sclerogibbidae, *Probethylus* Ashmead, 1902



Figura 37. Scolebythidae, *Clystopsenella* Kieffer, 1911



Figura 38. Formicidae, *Cylindromyrmex* Mayr, 1870

Labidus Jurine, 1807
Lachnomyrmex Wheeler, 1910
Leptogenys Roger, 1861
Linepithema Mayr, 1866
Mayaponera Schmidt & Shattuck, 2014
Megalomyrmex Forel, 1885
Monomorium Mayr, 1855
Myocepus Forel, 1893
Myrmelachista Roger, 1863
Myrmicocrypta F. Smith, 1860
Neivamyrmex Borgmeier, 1940
Neoponera Emery, 1901
Nesomyrmex Wheeler, 1910
Nomamyrmex Borgmeier, 1936
Nylanderia Emery, 1906
Octostruma Forel, 1912
Odontomachus Latreille, 1804
Oxyepoecus Santschi, 1841
Pachycondyla Smith, 1858
Paratrechina Motschoulsky, 1863
Pheidole Westwood, 1839
Platythyrea Roger, 1863*
Prionopelta Mayr, 1866*
Procryptocerus Emery, 1887
Pseudomyrmex Lund, 1831
Rogeria Emery, 1894



Figura 39. Mutillidae, *Hoplocrates* Mickel, 1937

Sericomyrmex Mayr, 1865
Simopelta Mann, 1922
Solenopsis Westwood, 1840
Stigmatomma Roger, 1859
Strumigenys Smith, 1860
Tapinoma Förster, 1850
Tetramorium Mayr, 1855
Thaumatomyrmex Mayr, 1887
Trachomyrmex Forel, 1893*
Typhlomyrmex Mayr, 1862
Wasmannia Forel, 1893

Vespoidea, Mutillidae

Calomutilla Mickel, 1952*
Darditilla Casal, 1965*
Ephuta Say, 1836
Hoplocrates Mickel, 1937 (Figura 39)
Hoplomutilla Ashmead, 1899
Horcomutilla Casal, 1962*
Lomachaeta Mickel, 1936*
Lophomutilla Mickel, 1952
Lophostigma Mickel, 1952*
Lynchiatilla Casal, 1963*
Pappognatha Mickel, 1939
Pertyella Mickel, 1952*
Pseudomethoca Ashmead, 1899*
Seabratilla Casal, 1963
Sphaerophthalma Blake, 1871*
Timulla Ashmead, 1899
Traumatomutilla André, 1901
Vianatilla Casal, 1962*
Xystromutilla André, 1905*

Vespoidea, Pompilidae

Abernessia Arlé, 1947
Aganiella Banks, 1911
Aganioides Ashmead, 1902*
Aimatocare Roig Alsina, 1989*
Anoplius Dufour, 1834
Aplochaes Banks, 1944*

Aporus Spinola, 1808* (Figura 40)

Aridestus Banks, 1947*

Auplopus Spinola, 1841

Balboana Banks, 1944*

Caliadurgus Pate, 1946*

Ceropaes Latreille, 1796*

Dicranoplius Haupt, 1950*

Dipogon Fox, 1897*

Entypus Dahlbom, 1843*

Epipompilus Kohl, 1884*

Episyron Schiødte, 1837*

Eragenia Banks, 1946

Euplaniceps Haupt, 1930*

Irenangelus Schultz, 1906*

Minagenia Banks, 1934*

Mystacagenia Evans, 1973

Notocyphus Smith, 1855

Pepsis Fabricius, 1804

Poecilopompilus Howard, 1901

Priochilus Banks, 1944

Priocnemis Schiødte, 1837*

Tachypompilus Ashmead, 1902*

Vespoidea, Rhopalosomatidae

Liosphex Townes, 1977*

Olixon Cameron, 1887*

Rhopalosoma Shuckard, 1841

(Figura 41)



Figura 40. Pompilidae, *Aporus* Spinola, 1808

Vespoidea, Scoliidae

Campsomeris Lepeletier, 1845

(Figura 42)

Vespoidea, Tiphiidae

Aelurus Klug, 1842*



Figura 41. Rhopalosomatidae, *Rhopalosoma* Shuckard, 1841



Figura 42. Scoliidae, *Campsomeris* Lepeletier, 1845

Anthobosca Guérin Méneville, 1830*
Atopothylnus Kimsey, 1991*
Epomidiopteron Romand, 1836*
Mallochessa Allen, 1972*
Mesothylnus Kimsey, 1991*
Methocha Latreille, 1804*
Myzinum Latreille, 1803*
Pterombrus Smith, 1869*
Scotaena Klug, 1810* (Figura 43)
Tiphia Fabricius, 1775*
Upa Kimsey, 1991*
Zeena Kimsey, 1991*

Vespoidea, Vespidae

Agelaia Lepeletier, 1836 (Figura 44)
Angiopolybia Araujo, 1946
Apoica Lepeletier, 1836
Brachygastra Perty, 1833
Cephalastor Giordani Soika, 1982
Chartergellus Bequaert, 1938
Epipona Latreille, 1802
Leipomeles Möbius, 1856
Mischocyttarus de Saussure, 1853
Monobia de Saussure, 1852
Montezumia de Saussure, 1852



Figura 43. Tiphidae, *Scotaena* Klug, 1810

Pachodynerus de Saussure, 1870
Pirhosigma Giordani Soika, 1978
Polistes Latreille, 1802
Polybia Lepeletier, 1836
Protonectarina Ducke, 1910
Protopolybia Ducke, 1905
Pseudodynerus de Saussure, 1855
Pseudopolybia de Saussure, 1863
Synoeca de Saussure, 1852
Zethus Fabricius, 1804

Apoidea, Ampulicidae

Ampulex Jurine, 1807*
Dolichurus Latreille, 1809*

Apoidea, Apidae

Acamptopoeum Cockerell, 1905
Ancyloscelis Latreille, 1829
Agapostemon Guérin-Meneville, 1844
Anthodioctes Holmberg, 1903
Anthrenoides Ducke, 1907
Apis Linnaeus, 1758
Ariphanarthra Moure, 1951
Augochlora Smith, 1853



Figura 44. Vespidae, *Agelaia* Lepeletier, 1836

- Augochlorella* Sandhouse, 1937
Augochloropsis Cockerell, 1897
Austrostelis Michener & Griswold, 1994
Bombus Latreille, 1802
Bothranthidium Moure, 1947
Centris Fabricius, 1804
Cephalotrigona Schwarz, 1940
Ceratalictus Moure, 1943
Ceratina Latreille, 1802*
Chilicola Spinola, 1851*
Coelioxys Latreille, 1809
Colletes Latreille, 1802*
Corynurella Eickwort, 1969*
Cyphomelissa Schrottky, 1902
Dialictus Robertson, 1902
Dicranthidium Moure & Urban, 1975
Dithygater Moure & Michener, 1955*
Epanthidium Moure, 1947
Epicharis Klug, 1807
Eufriesea Cockerell, 1909
Euglossa Latreille, 1802 (Figura 45)
Eulaema Lepeletier, 1841
Eulonchopria Brèthes, 1909
Eurytis Smith, 1854
Exaerete Hoffmannsegg, 1817
Exomalopsis Spinola, 1853
Florilegus Robertson, 1900
Friesella Moure, 1946
Frieseomelitta Ihering, 1912
Gaesischia Michener, LaBerge & Moure, 1955
Habralictus Moure, 1941*
Hoplocolletes Michener, 1965
Hoplostelis Dominique, 1898
Hylaeus Fabricius, 1793*
Hypanthidium Cockerell, 1904
Larocanthidium Urban, 1997
Leiopodus Smith, 1854
Lestrimelitta Friese, 1903
Leurotrigona Moure, 1951
Lophopedia Michener & Moure, 1957
Megachile Latreille, 1802
Megalopta Smith, 1853
Megaloptidia Cockerell, 1900
Megommation Moure, 1943
Melipona Illiger, 1806
Melissoptila Holmberg, 1884
Melitoma Lepeletier & Serville, 1828
Melissodes Latreille, 1829
Mesoplia Lepeletier, 1841
Microsphecodes Eickwort & Stage, 1972*
Moureanthidium Urban, 1995
Mydrosoma Smith, 1879
Nananthidium Moure, 1947
Nannotrigona Cockerell, 1922
Neocorynura Schrottky, 1910*
Nomada Scopoli, 1770*
Odyneropsis Schrottky, 1902*
Osiris Smith, 1854
Oxaea Klug, 1807
Oxytrigona Cockerell, 1917
Parapsaenythia Friese, 1908
Paratetrapedia Moure, 1941
Paratrigona Schwarz, 1938*
Partamona Schwarz, 1939



Figura 45. Apidae, *Euglossa* Latreille, 1802

Plebeia Schwarz, 1938
Protodiscelis Brèthes, 1909
Psaenythia Gerstaecker, 1868
Pseudagapostemon Schrottky, 1909
Pseudaugochlora Michener, 1954
Ptiloglossa Smith, 1853*
Rhathymus Lepeletier & Serville, 1828
Rhinocorynura Schrottky, 1909
Rhopitulus Ducke, 1907*
Saranthidium Moure & Hurd, 1960
Scaptotrigona Moure, 1942
Scaura Schwarz, 1938
Schwarziana Moure, 1943
Temnosoma Smith, 1853*
Tetragona Lepeletier & Serville, 1828
Tetragonisca Moure, 1946
Tetrapedia Klug, 1810
Thectochlora Moure, 1940
Thygater Holmberg, 1884
Trichocerapis Cockerell, 1904
Trigona Jurine, 1807
Trigonisca Moure, 1950
Trigonopedia Moure, 1941
Tropidopedia Michener & Moure, 1957
Xylocopa Latreille, 1802

Apoidea, Crabronidae

Argogorytes Ashmead, 1899*
Aroliagorytes Bohart, 2000*
Astata Latreille, 1796
Bembecinus A. Costa, 1859*
Bembix Fabricius, 1775
Bicyrtes Lepeletier, 1845
Bothynostethus Kohl, 1884*
Cerceris Latreille, 1802*
Clitemnestra Spinola, 1851*
Ectemnius Dahlbom, 1845
Editha Parker, 1929

Enoplolindenius Rohwer, 1911*
Entomocrabro Kohl, 1905*
Epinysson Pate, 1935*
Foxia Ashmead, 1898*
Holcorhopalum Cameron, 1904*
(Figura 46)
Hoplisoides Gribodo, 1884*
Incastigmus Finnamore, 1995
Larra Fabricius, 1793
Lecrenierus Leclercq, 1977*
Lestiphorus Lepeletier, 1832*
Liogorytes Bohart, 1967*
Liris Fabricius, 1804*
Lyroda Say, 1837*
Microbembex Patton, 1879
Microstigmus Ducke, 1907
Nitela Latreille, 1809*
Oxybelus Latreille, 1796*
Pae Pate, 1944*
Philanthus Fabricius, 1790*



Figura 46. Crabronidae,
Holcorhopalum Cameron, 1904

Pison Jurine in Spinola, 1808
Pisoxylon Menke, 1968*
Pluto Pate, 1937
Podagritys Spinola, 1851*
Psen Latreille, 1796*
Pterygorytes Bohart, 1967
Quexua Pate, 1942*
Rhopalum Stephens, 1829*
Rubrica Parker, 1929
Sagenista Bohart, 1967
Scapheutes Handlirsch, 1887*
Selman Parker, 1929
Solierella Spinola, 1851*
Spilomena Shuckard, 1838*
Stictia Illinger, 1807
Stigmus Panzer, 1804*
Tachysphex Kohl, 1883

Tachytes Panzer, 1806
Tracheliodes Morawitz, 1866*
Trachypus Klug, 1810*
Trypoxylon Latreille, 1796

Apoidea, Sphecidae
Ammophila Kirby, 1798
Dynatus Lepeletier, 1845
Eremnophila Menke, 1964
Isodontia Patton, 1880*
Penepodium Menke in Bohart & Menke, 1976
Podium Fabricius, 1804
Prionyx Vander Linden, 1827
Sceliphron Klug, 1801
Sphex Linnaeus, 1758
Trigonopsis Perty, 1833

Discussion

Fernández & Sharkey (2006) estimated 2,520 genera of Hymenoptera in the Neotropical region. So the total of 973 genera recognized from Espírito Santo represents about 38.6% of their estimate. The area of Espírito Santo is approximately 46,000 km, representing close to 0.23% of the Neotropical region. Given its high diversity of habitats and geographic location, a high level of faunistic biodiversity is expected. About 57% of the genera listed here are new records from this state. That indicates how the fauna of Hymenoptera this area is poorly studied.

Guénard *et al.* (2012) expected 75 genera of ants for Espírito Santo, according to an interpolation model. The Espírito Santo ant fauna was known from 58 genera, and we found six more totaling 64 genera, if the recent splitting (Schmidt & Shattuck 2014) of *Pachycondyla* is not taken into account, and 66 genera considering the new definition of *Pachycondyla*. One possible reason for the present list not fulfilling these authors' expectations could be that the new data in the present checklist was mostly based on material collected using Malaise traps, available through the UFES collections. This clearly must have produced sampling bias and prevented the sampling from being exhaustive, given that several taxa need specific strategies for exhaustive sampling (see

Noyes, 1989). Nevertheless, this extensive use of Malaise traps permitted the capture of several ant species for poorly collected genera, such as two species of *Acanthostichus* and three species of *Cylindromyrmex* for Espírito Santo compared with only one species of the former genus and none for the latter in the intensive leaf litter sampling of Silva & Brandão (2014) throughout the Atlantic Forest. Given the known distribution records for ants in surrounding states (Guénard *et al.*, 2012; Silva & Brandão, 2014) we expect the following, relatively widespread, genera also to be present in Espírito Santo: *Acropyga*, *Centromyrmex*, *Cryptopone*, *Forelius*, *Kalathomyrmex*, *Mycetagroicus*, *Mycetophylax*, *Mycetarotes*, *Ochetomyrmex*, *Proceratium*, *Pseudoponera*, and *Tranopelta*. *Mycetosoritis*, *Rasoponera*, and *Tropidomyrmex*, while not as widespread as the previous genera, are to be found in neighboring states and may be present. Given the busy activities in the port city of Vitória, additional invasive ant genera, such as *Cardiocondyla*, may also be eventually sampled. These considerations suggest the presence of at least 78 ant genera in Espírito Santo, and perhaps 81 or 82.

It is important to point out that this is the first check list of Hymenoptera from Espírito Santo and based mostly on material collected by Malaise traps in areas of Atlantic forest. Thus future field expeditions using several different methods of sampling and in different habitats will certainly improve the coverage of the present list. In spite of the sampling limitations, this checklist represents the first attempt at producing concrete faunistic estimates for a state in Southeastern Brazil, and the authors hope that it will be a starting point for more thorough research of these organisms.

Acknowledgements

We thank Paulo Stein, Chirlei Brito, Mirella Tostes, Lidiana Zamprogno, Magno Ramos, Fernanda Gomes, and Felipe Fraga for mounting and labeling thousands of specimens; Sandra Fagundes for helping in preparing of thousands of pages of the report; Isabel Alencar, Diego Barbosa, and Anderson Pessan for assisting N.E.S.H.; to Chirley Brito again for uploading references and checklist; to Nelson Perioto for identifying the genus of the Eurytomidae illustrated. We also thank CNPq/FAPES, call Pronex program, for the financial support to the proposal “N.E.S.H. – Hymenoptera Systematics Center: broadening agricultural and environmental frontiers of Espírito Santo”, grant #52263010/2011 under coordination of COA. We thank Valéria Fagundes, Sandra Fagundes, and Viviana Corte for encouraging us in several steps of this work. USDA is an equal opportunity provider and employer.

Literature Cited

- Aguiar, A. P.; Deans, A. R.; Engel, M. S.; Forshage, M.; Huber, J. T.; Jennings, J. T.; Johnson, N. F.; Lelej, A. S.; Longino, J. T.; Lohrmann, V.; Mikó I.; Ohl, M.; Rasmussen, C.; Taeger, A. & Yu, D. S. 2013. Order Hymenoptera. *Zootaxa*, 3703: 51-62.
- Alencar, I. D. C. C.; Fraga, F. B.; Tavares, M. T. & Azevedo, C. O. 2007. Perfil da fauna de vespas parasitóides (Insecta, Hymenoptera) em uma área de Mata Atlântica do Parque Estadual de Pedra Azul, Domingos Martins, Espírito Santo, Brasil. *Arquivos do Instituto Biológico de São Paulo*, 74: 111-114.
- Austin, A. D. & Dowton, M. 2000. The Hymenoptera: an introduction. In Austin, A. D. & Dowton, M. (eds) *Hymenoptera: evolution, biodiversity and biological control*. CSIRO Publishing, Collingwood.
- Azevedo, C. O. & Santos, H. S. 2000. Perfil da fauna de himenópteros parasitóides (Insecta, Hymenoptera) em uma área de Mata Atlântica da Reserva Biológica de Duas Bocas, Cariacica, ES, Brasil. *Boletim do Museu Biológico Mello Leitão*, 11: 117-126.
- Azevedo, C.O.; Kawada, R.; Tavares, M.T. & Periotto, N.W. 2002. Perfil da fauna de himenópteros parasitóides (Insecta, Hymenoptera) em uma área de Mata Atlântica do Parque Estadual da Fonte Grande, Vitória, ES, Brasil. *Revista Brasileira de Entomologia*, 46: 133-137.
- Azevedo, C.O.; Corrêa M.S.; Gobbi F.T.; Kawada R.; Lanes G.O.; Moreira A.R.; Redighieri E.S.; Dos Santos L.M. & Waichert C. 2003. Perfil das famílias de vespas parasitoides (Hymenoptera) em uma área de Mata Atlântica da Estação Biológica de Santa Lúcia, Santa Lúcia, Santa Teresa, ES, Brasil. *Boletim do Museu Biológico Mello Leitão*, 16: 39-46.
- Fernández, F. & Sharkey, M. J. 2006. *Introducción a los Hymenoptera de la Región Neotropical*. Sociedad Colombiana de Entomología y Universidade Nacional de Colombia, Bogotá, 894 pp.
- Grimaldi, D. & Engel, M. S. 2005 *Evolution of the insects*. Cambridge University Press, 755 pp.
- Grissell, E. E. 1999. Hymenopteran diversity: some alien notions. *American Entomologist*, 45: 235-244.
- Guénard, B.; Weiser, M. D. & Dunn, R. R. 2012. Global models of ant diversity suggest regions where new discoveries are most likely are under disproportionate deforestation threat. *Proceedings of the National Academy of Sciences*, 109: 7368-7373.
- Heraty, J.; Ronquist, F.; Carpenter J. M.; Hawks, D.; Schulmeister, S.; Dowling, A. P.; Murray, D.; Munro, J.; Wheeler, W.C.; Schiff, N. & Sharkey,

- M. 2011. Evolution of the hymenopteran megaradiation. *Molecular Phylogenetics and Evolution*, 60: 73-88.
- Huber, J. T. 2009. Biodiversity of Hymenoptera. In Footit, R. G. & Adler, P. H. (eds) *Insect Biodiversity: Science and Society*. Wiley- Blackwell
- Lani, J. L.; Resende, M.; Rezende, S. B. & Feitosa, L. R. 2008. *Atlas dos Ecossistemas do Espírito Santo*. Secretaria Estadual de Meio Ambiente e Recursos Hídricos, UFV, Viçosa. 504 p.
- New, T. R. 2012. *Hymenoptera and Conservation*. Hoboken, NJ, Wiley-Blackwell, 232 pp.
- Noyes, J. S. 1989. A study of five methods of sampling Hymenoptera (Insecta) in a tropical rainforest, with special reference to the parasitica. *Journal of Natural History*, 23: 285-298.
- Schmidt, C. A. & Shattuck, S. O. 2014. The Higher Classification of the ant subfamily Ponerinae (Hymenoptera: Formicidae), with a Review of Ponerine Ecology and Behavior. *Zootaxa*, 3817: 1-242.
- Sharkey, M. J. 2007. Phylogeny and Classification of Hymenoptera. *Zootaxa*, 1668: 521-548.
- Sharkey, M. J.; Carpenter, J. M.; Vilhelmesen, L.; Heraty, J.; Liljeblad, J.; Ashley, P. G.; Dowling, P. G.; Schulmeister, S.; Murray, D.; Deans, A. R.; Ronquist, F.; Krognam, L. & Wheeler, W. C. 2011. Phylogenetic relationships among superfamilies of Hymenoptera. *Cladistics*, 27: 1-33.
- Silva, R. & Brandão, C. R. F. 2014. Ecosystem-wide morphological structure of leaf-litter ant communities along a tropical latitudinal gradient. *Plos One*, 9: e93049.