

CDF Checklist of Galapagos Ants, bees, wasps and related groups

John M. Heraty, Henri W. Herrera

Last updated: 17 Jan 2018

Abstract

This Checklist of Galapagos Ants, bees, wasps and related groups includes a total of all 84 taxa reported from the Galapagos Islands. For each name, detailed information is provided: its Galapagos distribution in islands groups or bioregions generated from the specimen records, comments about the taxonomy (especially synonyms), the origin (native and introduced), taxon status (accepted vs. rejected records) and relevant literature references.

Introduction

This publication lists all species of Galapagos Ants, bees, wasps and related groups currently known.

The **Hymenoptera** are among largest orders of insects, comprising diverse groups like sawflies, wasps, bees, termites, and ants.

The name refers to their transparent wings, from the Greek *hymen* meaning “membrane” and *pteron* meaning “wing”.

Methods

This checklist of all known Galapagos Ants, bees, wasps and related groups is automatically generated using the online database of the Charles Darwin Foundation Galapagos Species Checklist.

All CDF Galapagos Species Checklists represent the synthesis of many different records: literature citations, data from previously unpublished reports (grey literature), specimen records of natural history collections located in Galapagos and all over the world. To the best of their knowledge authors of the individual checklists revised all available data. When new information becomes available, the taxonomy of a group changes or new species are discovered, the CDF online database and thus this publication becomes updated.

For many poorly known species groups the higher taxonomic classification still regularly changes according to how our knowledge about species being related changes. In many well known groups the phylogeny is somewhat stable, but to avoid confusion, in particular for groups where taxonomic changes are frequent, all checklists presented here are sorted alphabetical according to genus name and specific epithet. Please refer to the website for the currently accepted taxonomic hierarchy of each group.

Please be aware that the distribution presented here is automatically generated from specimen records and does not always accurately reflect the known distribution for all species.

For marine species, the distribution generally refers to the five main bioregions of the archipelago (Far Northern, Northern, Western, South Eastern and the Elisabeth Bay Bioregion). For the terrestrial species more than 120 islands, islets and small rocks have been aggregated into Islands Groups, thus, for example, the island group "Santa Cruz" includes smaller islands like Santa Fé, Plaza Norte, Plaza Sur, Baltra, Daphne Mayor, Daphne Minor, and others.

IUCN red-list assessments presented here may deviate from the global IUCN list for the following reasons:

- for well known species groups like vascular plants or vertebrates updates proposed to the IUCN are shown instead of the outdated, but currently accepted status;
- for poorly known species groups (e.g., lichenized fungi) a general assessment is currently not possible and the list presented here is a regional red-list list for Galapagos archipelago.

Numbers of the species included in this list are auto-generated. Adding up the number of species in each category will not always equal the total number indicated. Some species have insufficient data to be categorized while others (e.g., category eradicated) will not be included in the total.

Results

Names of taxa included in this checklist: 84 (71 accepted, 1 unidentified taxon, 2 doubtful, 4 preliminary identification, 4 problematic, 2 new to science).

Origin of the taxa included: 57 accidental, 1 questionable accidental, 3 questionable native, 6 endemic, 2 questionable endemic.

1. *Adelomyrmex myops* (Wheeler, 1910)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), Herrera, H.W. et al. (2008).

2. *Anagyrus trinidadensis* (Kerrich, 1953)

Taxon status: Accepted name; taxon occurs in Galapagos.

Syn.: *Apoanagyrus trinidadensis* (Kerrich, 1953)

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), Peck, S.B. et al. (1998).

3. *Anthidium vigintiduopunctatum* Friese

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Gonzalez, V.H. et al. (2009).

4. *Aphytis acutaspidis* Rosen & DeBach, 1979

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Peck, S.B. et al. (1998).

5. *Aprostocetus* sp.

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: No Data.

6. *Bephratelloides cubensis* (Ashmead)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: No Data.

7. *Brachygastra lecheguana* (Latreille, 1824)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), Hogue, C. et al. (1993), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996), Roque-Albelo, L. et al. (1999).

8. *Brachymeria cabira* (Walker, 1838)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: No Data.

9. *Brachymeria funscolombi* (Dufoni)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: No Data.

10. *Brachymyrmex heeri* Forel, 1874

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), Herrera, H.W. et al. (2008).

11. *Camponotus conspicuus zonatus* Emery, 1894

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

12. *Camponotus macilentus* F. Smith, 1877

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Endemic.

References: Jaramillo, P. et al. (2005), McMullen, C.K. et al. (2010), McMullen, C.K. et al. (2011), Stitz, H. et al. (1932), von Aesch, L. et al. (2005).

13. *Camponotus planus* F. Smith, 1877

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Endemic.

References: Jaramillo, P. et al. (2010), Stitz, H. et al. (1932), von Aesch, L. et al. (2005).

14. *Cardiocondyla emeryi* Forel, 1881

Taxon status: Accepted name; taxon occurs in Galapagos.

Cardiocondyla emeryi Forel, 1881: 5 (w.) VIRGIN IS. Andr ©, 1881b: 69 (m.); Forel, 1904f: 422 (q.); Emery, 1909a: 26 (m. ergatoid m., not q.); Arnold, 1916: 201 (q.). Senior synonym of nereis: Wilson & Taylor, 1967: 53; of monilicornis: Baroni Urbani, 1973: 200; of mahdii, mauritia, rasalamae: Bolton, 1982: 312. See also: Smith, M.R. 1944a: 33; Kugler, J. 1984: 3; Seifert, 2003a: 276. Current subspecies: nominal plus fezzanensis.

Origin: Introduced, Accidental.

References: Lubin, Y.D. et al. (1984), von Aesch, L. et al. (2005).

15. *Cardiocondyla minutior* Forel, 1899

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

16. *Cardiocondyla nuda* (Mayr, 1866)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: von Aesch, L. et al. (2005).
17. *Centrodora mireyae* (DeSantis, 1981)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
18. *Centrodora perkinsi* (Waterston, 1917)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
19. *Cheiloneurus elegans* (Dalmon, 1820)
Taxon status: Accepted name; taxon occurs in Galapagos.
Syn.: *Cheiloneurus elegans elegantissimus* DeSantis, 1964
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
20. *Coccophagus rusti* Compere, 1928
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
21. *Conura femorata* (Fabricius, 1775)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
22. *Crematogaster "JTL-022"*
Taxon status: Identification not yet confirmed.
Origin: Introduced, Accidental.
23. *Crematogaster curvispinosa* Mayr, 1862
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, Accidental.
24. *Cylindromyrmex whymperi* (Cameron, 1891)
Taxon status: Accepted name; taxon occurs in Galapagos.
Syn.: *Holcaponera whymperi* Cameron, 1891: 92, fig. (w.) ECUADOR. Combination in *Cylindromyrmex*: Forel, 1892f: 256. Junior synonym of *striatus*: Emery, 1901a: 54. Revived from synonymy and senior synonym of *schmidti*, *tibialis*, *williamsi*: De Andrade, 1998a: 596.
Origin: Introduced, Questionable Accidental.

25. *Cyphomyrmex nesiotus* Snelling & Longino, 1992
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, Endemic.
26. *Cyphomyrmex rimosus* (Spinola, 1851)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Causton, C.E. et al. (2008), Herrera, H.W. et al. (2008).
27. *Cyphomyrmex sp. nov. "hh04"*
Taxon status: Unpublished name (Nomen nudum).
Origin: No Data.
28. *Diplazon laetatorius* Fabricius, 1781
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998), Peck, S.B. et al. (1996).
29. *Dorymyrmex pyramicus albemarlensis* Wheeler, 1919
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, No Data.
References: Wheeler, W.M. et al. (1924), Wheeler, W.M. et al. (1933).
30. *Encarsia citrina* (Craw, 1891)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
31. *Encarsia diaspidicola* (Silvestri, 1909)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
32. *Encarsia pergandiella* Howard, 1907
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Causton, C.E. et al. (2008), Peck, S.B. et al. (1998).
33. *Evania appendigaster* (Linnaeus, 1758)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998), Peck, S.B. et al. (1996).

34. *Exoristobia* sp.
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: No Data.
35. *Hypoconera beebii* (Wheeler, 1924)
Taxon status: Taxonomic status unresolved or unrevised.
Origin: No Data.
References: Linsley, E.G. et al. (1966), Peck, S.B. et al. (1994), Peck, S.B. et al. (1994).
36. *Hypoconera opaciceps* (Mayr, 1887)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1994), Peck, S.B. et al. (1994).
37. *Hypoconera punctatissima* (Roger, 1859)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Causton, C.E. et al. (2008).
38. *Hypoconera* sp.
Taxon status: Taxon not identified to species, subspecies, form or variety.
Origin: No Data.
References: Lubin, Y.D. et al. (1984), von Aesch, L. et al. (2005).
39. *Leptogenys "jel-san"*
Taxon status: Identification not yet confirmed.
Origin: Native, Questionable Endemic.
40. *Leptogenys* sp. nov. "*hh03*"
Taxon status: Unpublished name (Nomen nudum).
Origin: No Data.
41. *Macroteleia absona* Muesebeck, 1977
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
42. *Megachile timberlakei* Cockerell
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Rasmussen, C. et al. (2012).
43. *Monomorium destructor* (Jerdon, 1851)
Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), von Aesch, L. et al. (2005).

44. *Monomorium floricola* (Jerdon, 1851)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), Linsley, E.G. et al. (1966), Lubin, Y.D. et al. (1984), McMullen, C.K. et al. (2011), Palacios, R.A. et al. (1975), Peck, S.B. et al. (1994), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996), von Aesch, L. et al. (2005), Wheeler, W.M. et al. (1924).

45. *Monomorium pharaonis* Linnaeus, 1758

Taxon status: Taxonomic status unresolved or unrevised.

Origin: No Data.

References: Linsley, E.G. et al. (1966), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996).

46. *Nasonia vitripennis* (Ashmead, 1904)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: No Data.

47. *Nylanderia fulva nesiotis* Wheeler, 1919

Taxon status: Taxonomic status unresolved or unrevised.

Prenolepis fulva Mayr, 1862: 698 (w.q.) BRAZIL. Forel, 1891b: 94 (m.); Forel, 1912i: 67 (m.). Combination in Pr. (*Nylanderia*): Forel, 1908b: 67; in *Paratrechina* (*Nylanderia*): Emery, 1925b: 222; in *Nylanderia*: Kempf, 1972a: 166; in *Paratrechina*: Snelling, R.R. & Hunt, 1976: 122; in *Nylanderia*: LaPolla, Brady & Shattuck, 2010a: 127. Senior synonym of *fumata*: Wild, 2007b: 45. See also: Fernández, 2000: 146; Fox, et al. 2010: 795. Current subspecies: nominal plus *biolleyi*, *cubana*, *fumatipennis*, *incisa*, *longiscapa*, *nesiotis*.

Origin: No Data.

References: Wheeler, W.M. et al. (1933).

48. *Nylanderia steinheili* (Forel, 1893)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Herrera, H.W. et al. (2014).

49. *Odontomachus bauri* Emery, 1892

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Questionable Native.

References: Linsley, E.G. et al. (1966), von Aesch, L. et al. (2005).

50. *Odontomachus ruginodis* Smith, 1937

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

51. *Odynerus galapagensis* Williams, 1926

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Endemic.

References: Abedrabbo, S. et al. (1991), Arnaud, P. H. Jr. et al. (1970), Linsley, E.G. et al. (1966), Williams, F.X. et al. (1926).

52. *Orasema costaricensis* Wheeler & Wheeler, 1937

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Peck, S.B. et al. (1998).

53. *Paratrechina longicornis* (Latreille, 1802)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Jaramillo, P. et al. (2005), Linsley, E.G. et al. (1966), McMullen, C.K. et al. (2010), von Aesch, L. et al. (2005), Wheeler, W.M. et al. (1933).

54. *Paratrechina steinheili* (Forel, 1893)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

55. *Paratrechina vaga* (Forel, 1901)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, No Data.

56. *Pheidole "hh01"*

Taxon status: Identification not yet confirmed.

Origin: No Data.

References: Herrera, H.W. et al. (2014).

57. *Pheidole aff. megacephala* (Fabricius, 1793)

Taxon status: Identification not yet confirmed.

Origin: Introduced, Accidental.

References: Mueller-Dombois, D. et al. (1987).

58. *Pheidole cf. williamsi* Wheeler, 1919

Taxon status: The identification of this taxon or its occurrence in Galapagos is doubtful.

Origin: No Data.

59. *Pheidole flavens* Roger, 1863

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

60. *Pheidole williamsi* Wheeler, 1919

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Native, Endemic.

References: Linsley, E.G. et al. (1966), Lubin, Y.D. et al. (1984).

61. *Polistes versicolor* (Oliver, 1791)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Abedrabbo, S. et al. (1991), Causton, C.E. et al. (2008), Footitt, R.G. et al. (2009), Langlor, D.W. et al. (2009), McMullen, C.K. et al. (2011), Peck, S.B. et al. (1994), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996), Peck, S.B. et al. (1994), Roque-Albelo, L. et al. (1999).

62. *Pteroptrix albifemur* (Girault, 1915)

Taxon status: Accepted name; taxon occurs in Galapagos.

Syn.: *Archenomus imitatrix* (Fullaway)

Origin: Introduced, Accidental.

References: Peck, S.B. et al. (1998).

63. *Pyramica membranifera* (Emery, 1869)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), Herrera, H.W. et al. (2008).

64. *Rogeria curvipubens* Emery, 1894

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008), Herrera, H.W. et al. (2008).

65. *Sceliphron caementarium* (Drury, 1773)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2008).

66. *Solenopsis geminata* (Fabricius, 1804)

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Accidental.

References: Causton, C.E. et al. (2006), Causton, C.E. et al. (2012), Causton, C.E. et al. (2008), Causton, C.E. et al. (2012), Causton, C.E. et al. (2008), Heraty, J.M. et al. (1994), Herrera, H.W. et al. (2008), Herrera, H.W. et al. (2010), Hoffmann, B. D. et al. (2004), Hoffmann, B.D. et al. (2004), Holway, D.A. et al. (2002), Lubin, Y.D. et al. (1984), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996), Pezzatti, P. et al. (1998), Plentovich, S. et al. (2011), Plentovich, S. et al. (2010), Roque-Albelo, L. et al. (1999), Tschinkel, W.R. et al. (2006), von Aesch, L. et al. (2005), Wheeler, W.M. et al. (1919).

67. *Solenopsis globularia pacifica* Wheeler, 1919

Taxon status: Accepted name; taxon occurs in Galapagos.

Origin: Introduced, Questionable Native.

References: Linsley, E.G. et al. (1966), von Aesch, L. et al. (2005), Wheeler, W.M. et al. (1924).

68. *Solenopsis gnoma* Pacheco, Herrera & Mackay, 2007
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, Questionable Endemic.
References: Pacheco, J. et al. (2007).
69. *Spalangia cameroni* Perkins, 1910
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
70. *Spalangia drosophilae* Ashmead, 1887
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
71. *Spalangia endius* Walker, 1839
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
72. *Strumigenys emmae* (Emery, 1890)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
73. *Strumigenys louisianae* Roger, 1863
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: von Aesch, L. et al. (2005).
74. *Tapinoma melanocephalum* (Fabricius, 1793)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Linsley, E.G. et al. (1966), Lubin, Y.D. et al. (1984), McMullen, C.K. et al. (2011), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996), von Aesch, L. et al. (2005), Wheeler, W.M. et al. (1924).
75. *Tetramorium bicarinatum* (Nylander, 1846)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Causton, C.E. et al. (2008), von Aesch, L. et al. (2005).
76. *Tetramorium caldarium* (Roger, 1857)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: von Aesch, L. et al. (2005).

77. *Tetramorium cf. lanuginosum* Mayr, 1810
Taxon status: The identification of this taxon or its occurrence in Galapagos is doubtful.
Origin: Introduced, Accidental.
78. *Tetramorium lanuginosum* Mayr, 1870
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
79. *Tetramorium lucayanum* Wheeler, 1905
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Herrera, H.W. et al. (2014).
80. *Tetramorium simillimum* (F. Smith, 1851)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Linsley, E.G. et al. (1966), Lubin, Y.D. et al. (1984), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996), von Aesch, L. et al. (2005), Wheeler, W.M. et al. (1933).
81. *Trissolcus teretis* Johnson
Taxon status: Taxonomic status unresolved or unrevised.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998).
82. *Venturia canescens* Gravenhorst, 1829
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Peck, S.B. et al. (1998), Peck, S.B. et al. (1996).
83. *Wasmannia auropunctata* (Roger, 1863)
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Introduced, Accidental.
References: Causton, C.E. et al. (2006), Causton, C.E. et al. (2005), Causton, C.E. et al. (2012), Causton, C.E. et al. (2008), Causton, C.E. et al. (2012), Causton, C.E. et al. (2008), Fournier, D. et al. (2005), Herrera, H.W. et al. (2008), Holway, D.A. et al. (2002), Linsley, E.G. et al. (1977), Lubin, Y.D. et al. (1984), McMullen, C.K. et al. (2010), Orivel, J. et al. (2009), Peck, S.B. et al. (1998), Peck, S.B. et al. (1996), Peck, S.B. et al. (1986), Peck, S.B. et al. (1996), Peck, S.B. et al. (1986), Roque-Albelo, L. et al. (1999), von Aesch, L. et al. (2005).
84. *Xylocopa darwini* Cockerell, 1926
Taxon status: Accepted name; taxon occurs in Galapagos.
Origin: Native, Endemic.
References: Abedrabbo, S. et al. (1991), Cockerell, T.D.A. et al. (1935), Helsen, P. et al. (2008), Jaramillo, P. et al. (2010), Jaramillo, P. et al. (2010), Linsley, E.G. et al. (1966), McMullen, C.K. et al. (1987), McMullen, C.K. et al. (2010), McMullen, C.K. et al. (2011), Parkin, P. et al. (1972).

Acknowledgements

We are grateful for the financial report received for this project. Please refer to the website (www.darwinfoundation.org/datazone/checklist/) for a detailed list of all our donors.

This checklist would not be possible without adjunct and collaborating scientists, and volunteers of the Charles Darwin Foundation. The following scientists and volunteers have contributed to the CDF Checklist of Galapagos Ants, bees, wasps and related groups: Sandra Abedrabbo, León L. Baert, Fabián Bersosa, Ruth Boada, Carolina Calderon, Charlotte Causton, Daniel Cherix, David Clarck, Germanía Estévez, Lilian Guzmán, John M. Heraty, María T. Lasso, María Piedad Lincango, E. G. Linsley, Yale Lubin, Alejandro Miele, Renato Oquendo, Christine E. Parent, Stewart B. Peck, Helmut W. Rogg, Lázaro Roque-Álbelo, Robert Silberglied, Leslie Usinger.

References

1. Abedrabbo, S. (1991) *Nueva Avispa Introducida en las Islas*. Carta Informativa 31: 4.
2. Arnaud, P. H. Jr. (1970) *Lists of the scientific publications and insect taxa described by Francis Xavier Williams (1882-1967)*. Occas. Pap. Calif. Acad. Sci. 80: 1-33.
3. Causton, C.E., Sevilla C. & Porter S.D. (2005) *Eradication of the little fire ant, *Wasmannia auropunctata* from Marchena Island, Galápagos on the edge of success?* Florida Entomologist 88: 159–168.
4. Causton, C.E., Peck, S. B., Sinclair, B. J., Roque-Albelo, L., Hodgson, C. J. & B. Landry. (2006) *Alien insects: threats and implications for the conservation of the Galapagos Islands*. Annals of the Entomological Society of America, 99(1), 121-143.
5. Causton, C.E., Sevilla, C. (2008) *Latest Records of Introduced Invertebrates in Galapagos and Measures to control them*. Galapagos Report 2006-2007, CDF, GNP and INGALA, Puerto Ayora, Galapagos, Ecuador, p. 142-145.
6. Causton, C.E., Sevilla, C. (2008) *Últimos Registros de Invertebrados Introducidos en Galápagos y Medidas para Controlarlos*. Informe Galápagos 2006-2007, CDF, GNP and INGALA, Puerto Ayora, Galápagos, Ecuador, p. 146-149.
7. Causton, C.E., Sevilla, C., Cabrera, W., Carrion, A. & Carrion, V. (2012) *Evaluación del Manejo de Hormigas Invasoras Galápagos. Reporte técnico*. Fundación Charles Darwin, Dirección Parque Nacional Galápagos, Island Conservation. 80pp.
8. Causton, C.E., Sevilla, C., Cabrera, W., Carrion, A. & Carrion, V. (2012) *Plan Estratégico Manejo Hormigas Invasoras Galápagos. Reporte técnico*. Fundación Charles Darwin, Dirección Parque Nacional Galápagos, Island Conservation. 20pp.
9. Cockerell, T.D.A. (1935) *The Templeton Crocker Expedition of the California Academy of Sciences, 1932. No. 28 The Carpenter Bees of the Galapagos Islands*. Proc. Calif. Acad. Sci., Fourth Series, 21(28): 379-382.
10. Footitt, R.G., Adler, P.H. (2009) *Insect Biodiversity: Science and Society*, John Wiley & Sons. pp. 494.
11. Fournier, D., Estoup, A., Orivel, J., Foucaud, J., Jourdan, H. Le Breton, J., & Keller, L. (2005) *Clonal reproduction by males and females in the little fire ant*. Nature 435 (7046): 1230–4. doi:10.1038/nature03705. PMID 15988525

12. Gonzalez, V.H., Koch, J.B. & Griswold, T. (2009) *Anthidium vigintiduopunctatum* Friese (Hymenoptera: Megachilidae): the elusive ‘‘dwarf bee’’ of the Galapagos Archipelago? Biological Invasions DOI 10.1007/s10530-009-9651-9
13. Helsen, P., Verdyck, P., Tye, A., Van Dongen, S. (2008) *Low levels of genetic differentiation between Opuntia echios varieties on Santa Cruz (Galápagos)* Springer-Verlag. 2009
14. Heraty, J.M. (1994) *Biology and importance of two eucharitid parasites of Wasmannia and Solenopsis*. In Williams, D. F. (ed.) *Exotic ants: Biology, impact, and control of introduced species*, Westview Press, Boulder, CO.: 104-120.
15. Herrera, H.W., Longino, J.T. (2008) *New records of introduced ants (Hymenoptera; Formicidae) in the Galapagos Islands*. Galapagos Research 65: 16-19.
16. Herrera, H.W., Causton, C.E. (2008) *Distribution of Fire Ants Solenopsis geminata and Wasmannia auropunctata (Hymenoptera: Formicidae) in the Galapagos Islands*. Galapagos Research 65: 11-14.
17. Herrera, H.W., Causton, C.E. (2010) *First Inventory of ants (Hymenoptera: Formicidae) on Baltra Island, Galápagos*. Noticias de Galápagos 67: 13-17
18. Herrera, H.W., Longino, J.T. & Dekoninck, W. (2014) *New records of nine ant species (Hymenoptera: Formicidae) for the Galapagos Islands* The Pan-Pacific Entomologist 90(2):72–81
19. Hoffmann, B. D., O’Connor, S. (2004) *Eradication of two exotic ants from Kakadu National Park*. Ecological Management and Restoration 5:98–105
20. Hoffmann, B.D., O’Connor, S. (2004) *Eradication of two exotic ants from Kakadu National Park*. Ecological Management and Restoration 5:98–105
21. Hogue, C. (1993) *Latin American Insects and Entomology*. University of California Press. 430 pp.
22. Holway, D.A., Lach, L., Suarez, A.V., Tsutsui, N.D. & Case, T.J. (2002) *The Causes and Consequences of Ant Invasions* Annu. Rev. Ecol. Syst. 33: 181-233.
23. Jaramillo, P., Reyes, D. & Yáñez, P. (2005) *Arthropods in the Charles Darwin Research Station herbarium, Galápagos, during 1999-2001*. GALAPAGOS RESEARCH. Noticias de Galápagos. 63: 23-25.
24. Jaramillo, P., Trigo, M. M., Ramírez, E. & Mauchamp, A. (2010) *Insect Pollinators of Jasminocereus thouarsii, an endemic cactus of the Galapagos Islands*. Galapagos Research 67: 21-25.
25. Jaramillo, P., Atkinson, R. (2010) *Evaluating Genetic Diversity for the Conservation of the Threatened Galápagos Endemic Calandrina galapagosa (Portulacaceae)* Biotropica. The journal, of Tropical, Biology and Conservation
26. Langlor, D.W., Sweeney, J. (2009) *Ecological Impacts of Non-Native Invertebrates and Fungi on Terrestrial Ecosystems* Springer. 66 pp.
27. Linsley, E.G., Usinger, R.L. (1966) *Insects of the Galápagos Islands*. Proceedings of the California Academy of Sciences Fourth Series 33(7): 113-196.

28. Linsley, E.G. (1977) *Insects of the Galápagos (Supplement)*. Occasional Papers of the California Academy of Sciences 125: 1-50.
29. Lubin, Y.D. (1984) *Changes in the native fauna of the Galápagos Islands following invasion by the little red fire ant, Wasmannia auropunctata*. Biological Journal of the Linnean Society 21(1-2): 229-242.
30. McMullen, C.K. (1987) *Biología reproductiva de las Angiospermas de las Islas Galapagos*. Pg. 39 - 52. Memorias: Taller sobre investigación Botánica y manejo en galapagos.
31. McMullen, C.K. (2010) *Nocturnal and diurnal pollination of Clerodendrum molle (Verbenaceae) in the Galápagos Islands* Plant Syst Evol (2011) 292:15-23
32. McMullen, C.K. (2011) *Pollination of the heterostylos Galápagos native, Cordia lutea (Boraginaceae)* Plant Syst Evol (2012) 298:569-579
33. Mueller-Dombois, D., Loope, L. (1987) *Algunos Aspectos Ecológicos unicos en Ecosistemas de Islas Oceánicas*. Memorias Taller sobre investigación Botánica y manejo en Galápagos. Pg. 24-32.
34. Orivel, J., Grangier, J., Foucaud, J., Le Breton, J., ANDRÈS, F. X., Jourdan, H., Delabie, J. C., Fournier, D., Cerdan, P., Facon, B., Estoup, A. & Dejean, A. (2009) *Ecologically heterogeneous populations of the invasive ant Wasmannia auropunctata within its native and introduced ranges*. Ecological Entomology, 34(4), 504-512.
35. Pacheco, J., Herrera, H.W. & Mackay, W. (2007) *A new species of Thief Ant of the Genus Solenopsis from the Galápagos Islands (Hymenoptera: Formicidae)*. Sociobiology 50(3): 1075-1086.
36. Palacios, R.A., Bravo, L.D. (1975) *Estudio morfológico de las semillas de Prosopis, II: Algunas especies Norteamericanas y Neotropicales*. Darwiniana 19(2-4): 357-372.
37. Parkin, P., Parkin D.T., Ewing, A.W. & Ford, H.A. (1972) *A report on the arthropods collected by the Edinburgh University Galapagos Islands Expedition, 1968*. The Pan-pacific Entomologist 48: 100-107.
38. Peck, S.B., Kukalova-Peck J. (1986) *Preliminary summary of the subterranean fauna of the galapagos islands, Ecuador. Part II. The insects, evolution, and biogeography*. Proc. 9th Intl. Congr. Speleology, Barcelona 2: 166-169.
39. Peck, S.B., Peck, J. (1986) *The Galapagos Islands. Volcanic caves and cave fauna of the Galapagos Islands*. The Canadian Caver 18(1): 42-49.
40. Peck, S.B. (1994) *Aerial dispersal of insects between and to islands in the Galápagos archipelago, Ecuador*. Annls. Entomol. Soc. Am. 87(2): 218-224.
41. Peck, S.B. (1994) *Sea-surface (Pleuston) transport of insects between islands in the Galápagos archipelago, Ecuador*. Annls. Entomol. Soc. Am. 87(5): 576-582.
42. Peck, S.B. (1996) *Origin and development of an insect fauna on a remote archipelago: The Galápagos Islands, Ecuador*. In: Keast A., Miller S.E. (eds.): *The origin and evolution of Pacific Island biotas, New Guinea to eastern Polynesia: patterns and processes*. SPB Academic Publishing, Amsterdam, The Netherlands, p. 91-122.
43. Peck, S.B. (1996) *The arthropods of the allobiosphere (barren lava flows) of the Galapagos islands, Ecuador* Noticias de Galápagos 56: 9-12.

44. Peck, S.B., Heraty, J., Landry, B. & Sinclair, B.J. (1998) *Introduced insect fauna of an oceanic archipelago: The Galápagos Islands, Ecuador*. *Am. Entomol.* 44: 218-237.
45. Pezzatti, P., Irzan, T. & Cherix, D. (1998) *Ants (Hymenoptera, Formicidae) of Floreana lost paradise?* *Noticias de Galápagos* 59: 11–20.
46. Plentovich, S., Swenson, C., Reimer, N., Richardson, M., & Garon, N. (2010) *The effects of hydramethylnon on the tropical fire ant, Solenopsis geminata (Hymenoptera: Formicidae), and non-target arthropods on Spit Island, Midway Atoll, Hawaii*. *J Insect Conserv* 14:459–465
47. Plentovich, S., Eijzenga, J., Eijzenga, H., & Smith, D. (2011) *Indirect effects of ant eradication efforts on offshore islets in the Hawaiian Archipelago*. *Biological Invasions* 13: 345-557.
48. Rasmussen, C. (2012) *Megachile timberlakei Cockerell (Hymenoptera: Megachilidae): Yet another adventive bee species to the Galapagos Archipelago* *The pan-Pacific Entomologist* 88(1):98–102
49. Roque-Albelo, L., Causton, C. (1999) *El niño and introduced insects in the galápagos islands: different dispersal strategies, similar effects*. *Noticias de Galápagos* 60: 30-36.
50. Stitz, H. (1932) *The Norwegian Zoological Expedition to the Galapagos Islands 1925, Conducted by Alf Wollebæk. 5. Formicidae*. *Med. Zool. Mus., Oslo* 31: 367-372.
51. Tschinkel, W.R. (2006) *The Fire Ants*. Belknap Press.
52. Wheeler, W.M. (1919) *Expedition of the California Academy of Sciences to the Galapagos Islands, 1905-1906. Part 15. The ants of Cocos Island*. *Proc. Calif. Acad. Scs., 4th Series* 2(2): 299-308.
53. Wheeler, W.M. (1924) *The Formicidae of the Harrison Williams Galapagos Expedition*. *Zoologica* 5(10): 101-122.
54. Wheeler, W.M. (1933) *The Templeton Crocker Expedition of the California Academy of Sciences, 1932. No. 6 Formicidae of the Templeton Crocker Expedition*. *Proc. Cal. Acad. Sc., Fourth Series* 21(6): 57-64.
55. Williams, F.X. (1926) *Expedition of the California Academy of Sciences to the Galapagos Islands, 1905-1906. XVIII. The bees and aculeate wasps of the Galapagos Islands*. *Proceedings of the California Academy of Sciences Fourth Series* 2(18): 347-357.
56. von Aesch, L., Cherix, D. (2005) *Introduced Ant Species and Mechanisms of Competition on Floreana Island (Galápagos, Ecuador) (Hymenoptera: Formicidae)*. *Sociobiology* 45(2): 463-481.

Disclaimer

The Charles Darwin Foundation Galapagos Species Checklist is a continuously updated list of all species currently known from the Galapagos Islands and reflects up-to-date knowledge compiled by scientists of the Charles Darwin Foundation (CDF) in collaboration with experts from around the world. CDF shares this data publicly and invites comments, corrections and additions.

Please do not hesitate to contact us; your input is very welcome. However, please understand that additions, changes, and corrections will be posted at periodic intervals after thorough cross-referencing of all new data. As an independent international scientific organization, the Charles Darwin Foundation relies on funding from donors who support our work. Please contact us at datazone@fcdarwin.org.ec if you would like to support the Charles Darwin Foundation Galapagos Species Checklist and help make knowledge of Galapagos biodiversity more widely available.