

HYMENOPTERA OF BERMUDA

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ABSTRACT

A recent survey of Bermuda's Hymenoptera resulted in 88 new records. This brings the number of known species to 199, representing 28 families. Approximately 25% of the species are cosmopolitan or tropicopolitan. A further 37% are common to Bermuda and eastern North America, and 24% originate from the Caribbean region. Two species are known to be endemic; at least six species remain undescribed.

RESUMEN

Una reciente encuesta de Himenópteros de las Bermudas resultó en 88 registros nuevos. Esto trae el número de especies conocidas a 199, representando a 28 familias. Aproximadamente el 25% de las especies son cosmopolitas o tropiolitas. El 37% son comunes de las Bermudas y del este de Norteamérica, y el 24% originan de la región del Caribe. Se sabe que dos especies son endémicas, y por lo menos seis especies se mantienen sin describir.

Bermuda is a small archipelago in the North Atlantic centered at 32°18' N, 64°46' W. Total land area of the seven main islands is only 54km². The climate is subtropical and frost-free, however, due to its small size, isolation, and geologically young age, Bermuda's native terrestrial fauna is depauperate. A survey of Bermuda's insects was initiated in 1987. For a review of entomology in Bermuda and an introduction to this project see Hilburn & Gordon (1989).

This report on the Hymenoptera (bees, wasps, and ants) includes all the species in the collection of the Bermuda Department of Agriculture and Fisheries (BDAF). It is now housed at the Bermuda Natural History Museum (BNHM) in Flatts, except for a small reference collection retained at BDAF's laboratory in Paget. Sweepnet and Malaise trap collecting by the authors in 1987 and 1988 added a large amount of new material to this collection. In addition, all records listed in Wheeler (1906), Ogilvie (1928), Bequaert (1929), Banks (1938), Waterston (1940), Crowell (1968), Haskins & Haskins (1965) and Gould (1988) are repeated here, though as noted in the text some were apparently misidentified or are no longer established on Bermuda. In many cases the original specimens could not be found.

Several dozen species of parasitic Hymenoptera have been intentionally released in Bermuda as biological control agents; only the ones which are thought to be established are reported here. For a complete list of introduced species see Bennett et al. (1985), Bennett & Hughes (1959), and Simmonds (1957).

One hundred ninety-nine species in 28 families are listed along with information on biology and world distribution. Included are 88 new Bermuda records. Approximately 25% of the species are cosmopolitan or tropicopolitan. A further 37% are common to Bermuda and eastern North America, and 24% originate from the Caribbean region.

Two species are known to be endemic. At least six species are underscribed, some of these may be endemic. In many cases only generic names are given, either because the species were not identifiable as a named Nearctic, Neotropical or Holarctic species, or because the genus (or family in some cases) needs study before the species can be named. Because a large number of the species are apparently adventive from North America, we hope this list encourages taxonomists to include Bermuda in future studies of Nearctic or Western Hemisphere species.

This list is arranged by superfamily, and then alphabetically by families within superfamilies and genera and species within families. Voucher specimens of most species are housed at the BNHM and/or the U.S. National Museum of Natural History (USNM), Washington, DC.

ICHNEUMONOIDEA

BRACONIDAE

Agathis gibbosa (Say)

(Bennett et al. 1985). "Native" parasite of potato tuber moth, *Phthorimaea operculella* (Zell.). Occurs throughout North America; probably adventive in Bermuda.

Apanteles carpatus (Say) New Record

One specimen in BDAF collection; Paget, 1966. Cosmopolitan; probably adventive in Bermuda.

Apanteles sp. near *feltiae* Viereck New Record

Numerous specimens collected Paget, 1987; probably an undescribed species.

Apanteles sp. near *laevicoxis* Muesebeck New Record

Seven specimens collected St. George's, Paget and Sandy's Parishes, 1966 and 1987. Close to North American *laevicoxis*, also similar to *insularis* Muesebeck from Grenada and St. Vincent; appears to be undescribed.

Apanteles sp. near *paranthrenidis* Muesebeck New Record

Ten specimens collected in St. George's, Smith's, and Sandy's Parishes, 1987. A. *paranthrenidis* occurs in eastern USA; also similar to several Caribbean species but appears distinct; probably undescribed.

Aphaereta pallipes (Say) New Record

Occurs throughout North America; probably adventive to Bermuda. One specimen collected Smith's Parish, 1987.

Aphidius matricariae Haliday New Record

Holarctic and Neotropical in distribution; attacks a wide variety of aphids. A specimen in USNM labeled "With lilies from Bermuda at Chicago 1961"; apparently caught in quarantine in Chicago. Probably adventive in Bermuda, although no other specimens seen.

Chelonus (*Microchelonus*) *phthorimaeae* Gahan

(Bennett et al. 1987). Introduced to Bermuda from California in 1945 for control of potato tuber moth. Specimens in U.S. National Museum from Bermuda collected 1948 indicate recovery after the initial release. Lack of recent specimens suggests no longer established.

Cotesia marginiventris (Cresson) New Record

Placed in *Apanteles* prior to 1981, occurs throughout Western Hemisphere. Of 14 specimens in BDAF collection, earliest date of collection is 1966. However, one specimen of *marginiventris* in BDAF collection incorrectly identified as *Apanteles solitarius* collected in 1923; probably the specimen mentioned by Ogilvie (1928). Apparently adventive in Bermuda.

Desmlostoma parvulum (Wesmael) New Record

Six specimens collected St. George's and Smith's Parishes, 1967 and 1987. Holarctic; probably adventive in Bermuda from eastern USA.

Diaeretiella rapae (M'Intosh)

(= *Diaeretus rapae* Curtis; Ogilvie 1928). Reported by Ogilvie (1928) to be parasitic on *Aphis pseudobrasicae*. No specimens found in BDAF collection; cosmopolitan.

Eubazus sp.

(= *Calyptus* sp.; Ogilvie 1928). No specimens in BDAF collection, however, one *Eubazus* collected Smith's Parish, 1988, may be species identified by Ogilvie.

Habrobracon gelechiae (Ashmead)

(= *Bracon gelechiae*; Bennett et al. 1985). Occurs throughout North America, Caribbean, and India; introduced and established in Bermuda 1945 and 1948 for control of potato tuber moth.

Habrobracon hebetor (Say) New Record

One specimen in BDAF collection reared from peanut shell, 1967. Cosmopolitan; adventive in Bermuda.

Heterospilus sp. near *chittendenii* Ashmead New Record

Genus presently being revised; several hundred species primarily from Western Hemisphere; species probably undescribed.

Lysiphlebus testaceipes (Cresson)

(= *Aphidius testaceipes*; Ogilvie 1928). Occurs throughout Western Hemisphere; probably adventive in Bermuda.

Meteorus autographae Muesebeck New Record

Occurs throughout eastern USA, adventive to Bermuda. Of six specimens in BDAF collection, two labelled as associated with potatoes infested with tuber moth. Known hosts of *autographae* mostly noctuid moths, one of these pests probably actual host.

Opius concolor Szepilgeti

(Bennett et al. 1985, = *Opius humilis* Silv.; Ogilvie 1928). Parasite of Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann), imported from Hawaii, 1926-27. Recovered in 1936, but not observed during 1950s and not collected since. Mediterranean fruit fly eradicated from Bermuda 1962.

Opius confundens Fischer New Record

One specimen collected Smith's Parish, 1987; occurs in South Carolina, Florida, Louisiana and Texas.

Phanerotoma sp.

(Ogilvie 1928). BDAF collection contains 17 specimens, some reared from lepidoptera larvae in oleander and cedar berries. Genus in need of study for the Western Hemisphere; species probably undescribed.

Pholetesor bedelliae (Viereck) New Record

Placed in *Apanteles* prior to 1981; occurs throughout eastern half of USA and parts of western states. Apparently adventive in Bermuda.

Pseudapanteles dignus (Muesebeck)

(= *Apanteles dignus* (Mues.); Bennett et al. 1985). "Native" parasite of potato tuber moth; occurs in Florida, California, Mexico, and Caribbean; probably adventive in Bermuda.

ICHNEUMONIDAE

Campoletis sonorensis (Cameron)

Two specimens in BDAF collection: 'Camden', Paget Parish, Nov. 1966; Devonshire Bay, Devonshire Parish, June 1987 with sweepnet. Widespread in North, Central, and South America.

Daidegma compressa (Cresson)

(= *Angitia blackburni* Cam.; Waterston 1940, Bennett and Hughes 1959, = *Daidegma blackburni* (Cram.); Bennett et al. 1985). Parasite of potato tuber moth when it attacks potato foliage or tomato fruit. First collected in 1932, now common; also occurs in eastern USA, California, and northern Mexico.

Enicospilus flavus (F.)

(Bequaert 1929; = *Henicospilus concolor* Cress; Ogilvie 1928). Collections throughout the year at lights; not common. West Indies, Central and South America.

Enicospilus doylei Gould

(Gould 1988). Also known from Florida, Louisiana, Bahamas, and Nicaragua.

Enicospilus purgatus (Say)

(Gould 1988). Parasite of various noctuid larvae. Widespread in New World.

Enicospilus trilineatus (Brulle)

(Gould 1988). Southeast USA, West Indies, Central and South America.

Itoplectis conquisitor (Say)

(= *Ephialtes (Itoplectis) conquisitor* (Say); Cushman 1920). No specimens in BDAF collection. North America; many hosts.

Labena nigra Rohwer

(Rohwer 1920). Described from five Bermuda specimens collected 1909. No recent collections; no specimens in BDAF collection.

Netelia sp.

(? = *Paniscus rufus* Brulle; Ogilvie 1928). Apparently an undescribed species; three specimens in BDAF collection: April and May 1967, Mount Hill, Pembroke Parish, at lights; Feb. 1967, Wreck Rd., Sandy's Parish, at light.

Ophion bermudensis Cushman

(Cushman 1940). Described from five Bermuda specimens. No recent collections; no specimens in BDAF collection.

Ophion sp.

(Ogilvie 1928). No specimens in BDAF collection; possibly *O. bermudensis*.

Rubicundella perturbatrix Heinrich

Collected from Devonshire Marsh, Devonshire Parish, 1955, and BDAF laboratory, Feb. 1964. Widespread in eastern USA, also occurs in California and Hawaii.

CHALCIDOIDEA

AGAONIDAE

Odontofroggata galili Wiebes New Record

Lives within syconia of *Ficus microcarpa*; does not pollinate florets. Native to eastern Asia; established in Israel and Florida.

Parapristina verticillata (Waterston) New Record

Pollinator of *Ficus microcarpa*; accidentally introduced early 1980's; epiphytic seedlings have become serious weeds in stone walls, roadcuts, palm tree crowns, and similar habitats. Native to Old World tropics and subtropics, now widespread in North, Central, and South America wherever *F. microcarpa* introduced.

Walkerella yoshiroi (Ishii) New Record

Like, *O. galili*, lives within syconia of *F. microcarpa*, but does not pollinate florets. Probably native to Asia; now also occurs in Florida and Brazil.

APHELINIDAE

Aphelinus sp. New Record

Specimens collected with sweepnet; Spittal Pond, Smith's Parish; Nonsuch Island, St. George's Parish; and Gibbon's Nature Reserve, Devonshire Parish, June 1988.

Aphytis diaspidis (Howard)

(Simmonds 1957, Bennett & Hughes 1959, Bennett et al. 1985, = *Aphytis fuscipennis* Howard; Waterston 1940, Simmonds 1957, Bennett & Hughes 1959, = *Aphelinus diaspidis* Howard; Ogilvie 1928). Introduced from Italy 1923 for control of *Pseudaulacaspis pentagona* (Targ.); also parasitizes *Acutaspis agavis* (Tns. & Ckll.), *Selenaspis articulatus* (Morg.), and *Comstockiella sabalis* Comst. Simmonds (1957) reports identity somewhat in doubt; *Aphytis* collected in Bermuda not typical *diaspidis*. *A. diaspidis* occurs eastern USA and California.

Aphytis mytilaspidis (LeBaron)

(Waterston 1940, Simmonds 1957, Bennett & Hughes 1959, Bennett et al. 1985). Cosmopolitan; attacks palmetto scale, *C. sabalis*, in Bermuda.

Aphytis sp.

(Bennett & Hughes 1959). Parasite of cedar scale, *Carulaspis minima* (Targ).

Aspidiotiphagus citrinus (Craw)

(Waterston 1940, Simmonds 1957, Bennett & Hughes 1959, = *Encarsia citrina* (Craw); Bennett et al. 1985). Accidentally introduced around 1940; further shipments imported from California 1955-56; parasitizes the following scale insects: *C. sabalis*, *P. pentagona*, *C. minima*, and *A. agavis*; cosmopolitan.

Aspidiotiphagus lounsburyi (Berlese & Paoli)

(Simmonds 1957, Bennett & Hughes 1959). Accidentally introduced around 1940; parasite of *C. minima*, *Diaspis boisduvalii* Sign., *Lepidosaphes beekii* (Newm.), *Pinnaspis aspidistrae* (Sign.), and *Pinnaspis strachani* (Cooley); also occurs in Florida.

Azotus sp. New Record

Collected with sweepnet Gilbert Nature Reserve, Sandy's Parish, June 1988.

Coccophagoides sp. New Record

Collected Berry Hill Rd., Paget Parish, June 1988.

Coccophagus flavoscutellum Ashmead

(Ogilvie 1928). Reportedly reared from *P. pentagona*; not found by later collectors; probably a misidentification.

Coccophagus ochraceus Howard

(Simmonds 1957). Parasite of *Pulvinaria psidii* Mask. and *Saissetia coffeae* Walk; occurs in Louisiana and California.

Coccophagus scutellaris (Dalman)

(Simmonds 1957). Parasite of *Coccus hesperidum* L., *Coccus viridis* (Green), *P. psidii*, *S. coffeae*, *Parasaissetia nigra* (Nietn.), and *Saissetia oleae* (Bern); known from Florida, and west coast USA.

Coccophagus sp. *lycimnia* group

(Simmonds 1957). Parasitizes *C. hesperidum*, and *S. coffeae*.

Coccophagus sp.

Collected in Malaise trap Berry Hill Rd., Paget Parish, June 1988.

Encarsia fasciata (Malenotti)

(= *Prospaltella fasciata* Malenotti; Simmonds 1957). Parasite of *C. minima*.

Encarsia formosa Gahan

(Bennett et al. 1985). Parasitizes *Metaleurodicus cardini* (Back) which attacks fiddlewood, *Citharexylum spinosum* L.; cosmopolitan.

Encarsia portoricensis Howard

(Waterston 1940, Simmonds 1957, Bennett & Hughes 1959, Bennett et al. 1985).
Introduced from USA 1926 and 1928; parasitizes palmetto scale, *C. sabalis*.

Encarsia sp.

(= *Prospaltella* sp.; Bennett & Hughes 1959). Parasite of *C. minima*; collected Spittal Pond, Smith's Parish, June 1988.

Eretmocerus sp. New Record

Collected in Malaise trap Berry Hill Rd., Paget Parish, and with sweepnet Gilbert Nature Reserve, Sandy's Parish, June 1988.

Marietta sp.

(Simmonds 1957). Hyperparasite associated with *S. nigra*. Collected in Malaise trap Paget Parish Sept. 1987.

Phycsus sp. near *testaceus* Masi

(Simmonds 1957). Parasite of *C. sabalis*.

CHALCIDIDAE

Spilochalcis sp. New Record

First collected 1955; a large chalcid now fairly common in sweepnet samples.

ENCYRTIDAE

Acerophagus pallidus Timberlake

(Simmonds 1957, Bennett et al. 1985). Introduced successfully from California, 1951 for control of *Phenacoccus madeirensis* Green (= *P. gossypii*). Hyperparasitized by *Chartocerus niger* (Ashm.).

Anagyrus fusciventris (Girault)

(Simmonds 1957, Bennett & Hughes 1959, Bennett et al. 1985). Imported from Australia 1951-53 and 1955 as a biological control agent for *Pseudococcus adonidum* L. Established successfully in Bermuda; also introduced to California.

Anagyrus sp. New Record

Collected in Malaise trap Berry Hill Rd., Paget Parish, and with sweepnet Gilbert Nature Reserve, Sandy's Parish June 1988.

Anicetus annulatus Timberlake

(Simmonds 1957). Parasite of *C. hesperidum*; also occurs Texas and California.

Arrhenophagus chionaspidis Aurivillius

(Simmonds 1957). Attacks both *D. boisduvalii*, and *P. strachani*; southeastern USA.

Carabunia waterstoni Subba Rao

(Bennett et al. 1985, = *Carabunia myersi* Waterston; Bennett et al. 1985). Imported from Jamaica 1959-61; parasitizes casuarina spittlebug, *Clastoptera undulata* Uhl. Recovered 1960, 1961, and 1965; not in recent collections (Bennett et al. 1985).

Cheilonerus pulvinariae Dozier

(Simmonds 1957, Bennett & Hughes 1959). Hyperparasite of *Microterys kotinsky* (Fullaway); southeastern USA.

Cheiloneurus sp.

(Simmonds 1957). Hyperparasite associated with *P. nigra*; in Malaise trap Spittal Pond, Smith's Parish. August 1987.

Coccidencyrus ochraceipes Gahan

(Simmonds 1957). Attacks *D. boisduvalii*; known from eastern USA.

Coccidoxenoides peregrinus (Timberlake)

(= *Pauridia peregrina* Timberlake; Simmonds 1957, Bennett & Hughes 1959, Bennett et al. 1985). Imported from south China 1951-53 as a biological control agent for *Planococcus citri* (Risso); established successfully in Bermuda and California.

Copidosoma floridanum (Ashmead) New Record

Reared from unidentified caterpillars feeding on potato leaves November 1966; eastern USA.

Copidosoma sp. New Record

Collected with sweepnet various locations 1988.

Encyrtus barbatus Timberlake

(Simmonds 1957). Attacks *C. hesperidum*; also found California.

Encyrtus infelix (Embleton)

(Simmonds 1957). Parasitizes *S. coffeae*; eastern USA.

Encyrtus lecaniorum (Mayr)

(Simmonds 1957). Attacks *P. nigra*; known from Europe and North America.

Epidinocarsis sp.

(= *Apoanogyrus* sp.; Simmonds 1957). Parasite of *P. madeirensis*; collected with sweepnet Nonsuch Island, St. George's Parish, June 1988.

Epitetraneura sp.

(= *Anabrolepis* sp.; Simmonds 1957). Parasitizes *P. adonidum*; collected in Malaise trap Berry Hill Rd., Paget Parish, June 1988.

Gahaniella sp. (not *tertia* Kerr)

(Simmonds 1957). Hyperparasite associated with *P. nigra*.

Leptomastidea abnormis (Girault)

(Simmonds 1957). Introduced from Sicily 1953 as a biological control agent; attacks *P. citri*; widespread in North America.

Leptomastidea dactylopii (Howard)

(= *Leptomastix dactylopii* Howard; Simmonds 1957, Bennett and Hughes 1959, Bennett et al. 1985). Introduced from Brazil 1952; mealybug parasite; apparently already present (Bennett et al. 1985). Widespread and common in sweepnet samples; also widespread in North America.

Litomastix sp. New Record

Collected in sweepnets and Malaise traps at several locations June 1988.

Metaphycus flavus (Howard)

(Simmonds 1957, Bennett et al. 1985, = *Aphycus flavus* How.; Bennett & Hughes 1959). Imported from Morocco and Spain 1953-54; apparently already present. Parasitizes *P. psidii*, and *S. coffeae* in Bermuda; widespread in eastern and southern North America.

Metaphycus stanleyi Compere

(Simmonds 1957, Bennett et al. 1985, = *Aphycus stanleyi* (Comp.); Bennett & Hughes 1959). Parasite of: *P. psidii*, *C. hesperidum*, *S. oleae*, and *P. nigra*; also occurs in California.

Metaphycus sp.

(Simmonds 1957). Reared from *Pulvinaria floccifera* (Westwood); additional *Metaphycus* collected with sweepnet several locations June 1988.

Microterys kotinskyi (Fullaway)

(Simmonds 1957, Bennett & Hughes 1957, Bennett et al. 1985). Introduced from Hawaii and California 1953-55 for control of *P. psidii*; well established and occurs throughout the islands.

Neodusmetia sangwani (Subba Rao)

(Bennett et al. 1985). Introduced from Texas 1968 as a biological control agent for Rhodes grass scale, *Antonia graminis* (Mask.); occurs in southern USA. *Neodusmetia* sp. possibly *sangwani* collected with sweepnet Paget, Smith's, and Sandy's Parishes 1987.

Plagiomerus sp.

(Simmonds 1957). Parasitizes *Howardia biclavis* (Comst.).

Procheiloneurus sp.

(Simmonds 1957, Bennett & Hughes 1959). Members of genus are hyperparasites; collected 1987 and 1988 in sweepnets and Malaise traps.

Pseudectroma europaeus (Mercet)

(= *Timberlania europaea* (Merc.); Bennett et al. 1985). Attacks Rhodes grass scale, *A. graminis*. *Pseudectroma* sp. collected with sweepnet Spittal Pond, Smith's Parish, June 1988, possibly this species.

Psyllaephagus sp. New Record

Collected with sweepnet Botanical Gardens, Paget Parish, June 1988.

Tetracnemoidea peregrinus (Compere)

(= *Arhopoideus peregrinus* (Comp.); Bennett et al. 1985, = *Tetracnemus peregrinus* Comp.; Simmonds 1957, Bennett and Hughes 1959). Imported from Argentina 1951 as a biological control agent for longtailed mealybug, *P. adonidum* L.; established successfully; also introduced to California. *Tetracnemoidea* sp. collected Berry Hill Rd., Paget Parish, June 1988, with Malaise trap possibly this species.

Trichomasthus portoricensis (Crawford)

(= *Coccidoxenus portoricensis* Crawf.; Simmonds 1957). Hyperparasite associated with *P. nigra*.

EULOPHIDAE

Aprostocetus spp. New Record

At least five species in genus collected various locations 1987 and 1988.

Ceranisus sp. New Record

A single specimen collected with sweepnet Gilbert Nature Reserve, Sandy's Parish, June 1988.

Chrysocharis sp. New Record

Fairly common in sweepnet and Malaise trap samples June 1988.

Chrysonotomyia sp. New Record

Collections made Sept. 1973 from eggs of *Calpodes* and June 1988 various locations with sweepnet.

Cirrospiloideus sp. New Record

Collected Gilbert Nature Reserve, Sandy's Parish, and Ferry Reach, St. George's Parish August 1987.

Closterocerus sp. New Record

Common in sweepnet samples many locations June 1988.

Diaulinopsis callichroma Crawford New Record

Widespread and common in sweepnet samples June 1988; occurs in New World tropics and subtropics.

Diglyphus spp. New Record

At least three species in genus collected June 1988; group needs revision.

Elachertus cidariae Ashmead New Record

Collected with Malaise trap Berry Hill Rd., Paget Parish, June 1988.

Elachertus sp. New Record

Collected with sweepnet Spittal Pond, Smith's Parish, June 1988.

Euderus sp. New Record

Collected Spittal Pond, Smith's Parish, and Admiralty House Park, Pembroke Parish, 1987 and 1988.

Euplectrus comstockii Howard New Record

Very common and widespread June 1988; known from USA, Central and South America.

Euplectrus sp. New Record

Very common August 1987 several locations.

Horismenus sardus (Walker) New Record

Collections made Spittal Pond, Smith's Parish and Gilbert Nature Reserve, Sandy's Parish, June 1988; known from Florida.

Horismenus texanus (Girault) New Record

Widespread and very common 1987 and 1988; known from eastern and southern USA.

Neotrichoporoides viridimaculatus (Fullaway) New Record

Collected several locations 1988; known from North and South America.

Pediobius williamsoni (Girault) New Record

Collected Spittal Pond, Smith's Parish, June 1988; eastern USA.

Pnigalio sp. New Record

Collected with sweepnet Spittal Pond, Smith's Parish, June 1988. Previously, one specimen collected Nonsuch Island, St. George's Parish, February 1967.

Sympiesis sp. New Record

Collected Spittal Pond, Smith's Parish, June 1988.

Tetrastichus spp. New Record

At least three species collected 1987 and 1988; group needs revision.

Zagrammosoma multilineatum (Ashmead) New Record

Collected Spittal Pond, Smith's Parish, June 1988 with sweepnet; known from USA, Puerto Rico, and South America.

EUPELMIDAE

Anastatus sp. New Record

Collected Berry Hill Rd., Paget Parish, June 1988 in Malaise trap.

Brasema sp. New Record

Collected Spittal Pond, Smith's Parish, June 1988 with sweepnet.

Eupelmus sp. New Record

Collected Spittal Pond, Smith's Parish, June 1988 with sweepnet; group needs revision.

Lecaniobius cockerelli Ashmead

(Ogilvie 1928, Simmonds 1957). Parasite of *P. nigra*; occurs in Florida, the West Indies, and Central and South America.

EURYTOMIDAE

Eurytoma spp. New Record

At least two species collected 1987 and 1988 several different locations.

MYMARIDAE

Alaptus sp.

(Simmonds 1957). Reared from *C. minima*; also collected Gilbert Nature Reserve, Sandy's Parish, June 1988 with sweepnet; genus nearly cosmopolitan.

Anagrus sp. New Record

Collected several locations June 1988; genus nearly cosmopolitan.

Anaphes sp. New Record

Collected Spittal Pond, Smith's Parish, June 1988 with sweepnet; genus nearly cosmopolitan.

Gonatocerus spp. New Record

In June 1988, at least three species collected various locations; genus nearly cosmopolitan.

Mymar sp. New Record

Collected Gilbert Nature Reserve, Sandy's Parish, June 1988; genus nearly cosmopolitan.

Polynema sp. New Record

Common many locations 1987 and 1988; genus nearly cosmopolitan.

PTEROMALIDAE

Anisopteromalus calandrae (Howard) New Record

Two specimens collected Southampton Parish Dec. 1982.

Asaphes sp. New Record

One specimen reared from aphid collected Paget Parish 1982.

Bubekia fallax Gahan New Record

One specimen collected in Malaise trap Paget Parish Oct. 1987.

Halticoptera sp. New Record

Very common many locations 1987 and 1988.

Heteroschema sp. New Record

Collected Horseshoe Bay, Southampton Parish June 1988.

Pachyneuron sp. New Record

Common many locations June 1988.

Pteromalus puparum (L.) New Record

Introduced 1988 from Virginia; gregarious pupal parasite of imported cabbageworm,

Pieris rapae (L.). Recoveries made May 1988, one month after release; cosmopolitan.

Pteromalus sp. New Record

Collected several locations June 1988.

Spalangia sp. New Record

One specimen collected August 1987, Penhurst Park, Smith's Parish; a second in Malaise trap Paget Parish October 1987.

Thinodytes sp. New Record

Collected Penhurst Park, Smith's Parish, August 1987.

Zatropis sp. New Record

Collected Penhurst Park, Smith's Parish and Nonsuch Island, St. George's Parish, 1987 and 1988.

SIGNIPHORIDAE

Chartocerus niger (Ashmead)

(Bennett et al. 1985, = *Thysanus niger* Ashm.; Waterston 1940, Simmonds 1957).

Hyperparasite of *A. pallidus*; occurs in eastern USA and California.

Signiphora louisianae (Dozier)

(= *Thysanus louisianae* Dozier; Simmonds 1957). Hyperparasite associated with *C. minima*; occurs in extreme southeastern USA.

Signiphora sp. New Record

Collected Gilbert Nature Reserve, Sandy's Parish, June 1988 with sweepnet.

TRICHOGRAMMATIDAE

Trichogramma exiguum Pinto & Planter

(prob. = *Trichogramma* sp.; Bennett & Hughes 1959, and Bennett et al. 1985).

Specimens in BDAF collection reared from eggs of *Calpodes ethlius* August 1983; no locality given.

Trichogramma sp. New Record

Collected in Malaise trap Berry Hill Rd., Paget Parish, June 1988.

CYNIPOIDEA

EUCOILIDAE

Didyctium sp. New Record

Two females collected in BDAF laboratory June 1966. Known hosts Phoridae (humpbacked flies).

Hexacola sp. New Record

A single specimen collected Hog Bay Level, Sandy's Parish, Aug. 1987 with sweepnet.

Kleidotoma sp. New Record

One specimen collected Admiralty House Park, Pembroke Parish, Aug. 1987 with sweepnet.

Leptopilina boulardi (Barbotin et al.) New Record

Collected from rotting pawpaws, 'Camden', Paget Parish, May 1966; parasite of *Drosophila melanogaster* Meigen; widely distributed in warmer parts of North and South America, Europe, and Africa.

EVANIOIDEA

EVANIIDAE

Evania appendigaster (L.)

(Ogilvie 1928). Common indoors during summer; parasitic on cockroach egg cases; nearly cosmopolitan, especially in warmer climates.

PROCTOTRUPOIDEA

DIAPRIIDAE

Trichopria spp. New Record

At least three species collected 1987 and 1988; genus badly in need of revision for Western Hemisphere.

PLATYGASTRIDAE

Platygaster sp. New Record

One specimen caught in Malaise trap Paget Parish, Sept. 1987; a second collected Horseshoe Bay, Southampton Parish, June 1988 with sweepnet; genus in need of study for Western Hemisphere.

Synopeas sp. New Record

Three specimens collected Smith's and Paget Parishes 1987 and 1988; genus in need of revision for Western Hemisphere.

SCELIONIDAE

Idris binotatus (Ashmead) New Record

Collected Paget Parish 1987; occurs in northeastern North America and probably adventive in Bermuda. Species in genus parasitic on spider eggs.

Telenomus spp. New Record

Several species collected 1986 and 1987. One series reared from Lepidoptera egg mass on *Mangifera indica*. Genus presently being studied; species not yet identifiable.

CERAPHRONOIDEA

CERAPHRONIDAE

Ceraphron sp. New Record

Three specimens collected Paget Parish 1987. Some species in genus develop as primary parasites, others as secondary parasites; hosts Diptera, Hymenoptera and Homoptera; entire family in need of study.

CHRYDIDOIDEA

BETHYLIDAE

Sclerodermus sp. New Record

Two specimens found in house Paget Parish May 1987; not an American species; may be adventive from Europe or Africa; probably not established.

Unidentified sp. New Record

A single specimen collected on flowers Spittal Pond, Smith's Parish, January 1988.

DRYINIDAE

Anteon funestus Perkins New Record

Known from Arizona; first collected in Bermuda Admiralty House Park, Pembroke Parish, and Hog Bay Level, Sandy's Parish, August 1987.

Unidentified sp. of Gonatopodinae

First collected 1966; recent collections from Spittal Pond and Penhurst Park, Smith's Parish, and Paget Parish. Genital armature of males different from known USA species; possibly new species or USA species with unknown males.

FORMICOIDEA

FORMICIDAE

Brachymyrmex heeri Forel

(Wheeler 1906, Ogilvie 1928). Probably introduced with plants from West Indies; found on citrus leaves and amongst grass, sometimes attending *Pseudococcus* spp. (Ogilvie 1928). Collected from *Cassia* tree Warwick Parish, July 1987; widespread in neotropics and West Indies.

Brachymyrmex sp.

Numerous males collected at Trott's Pond, Hamilton Parish, July 1966 in grass and in McPhail trap baited with torula yeast Warwick Parish; may be *B. heeri*.

Camponotus novaeboracensis (Fitch) New Record

Intercepted in imported Christmas trees Dec. 1983 and Dec. 1986; a northern North American species; not established in Bermuda.

Cardiocondyla emeryi Forel

(Wheeler 1906, Ogilvie 1928). Not common, but widespread in Bermuda; most abundant Aug. and Sept.; a tramp specie distributed by commerce throughout tropics.

Crematogaster sp. New Record

Intercepted in coconuts from West Indies, July 1967.

Hypoponera opaciceps (Mayr)

(= *Ponera opaciceps* Mayr; Wheeler 1906, Ogilvie 1928). No specimens in BDAF

collection; probably misidentified or no longer established. Spread by commerce; found in both New and Old World tropics and subtropics.

Iridomyrmex humilis (Mayr)

Argentine Ant. (Haskins & Haskins 1965, Crowell 1968). First detected 1948 (Bennett & Hughes 1959); presumably arrived in imported nursery stock. Now common islandwide; distribution patchy. Native to South America; distributed by commerce, now tropicopolitan.

Lasius niger L.

(Wheeler 1906, Ogilvie 1928). Wheeler (1906) felt probably introduced; holarctic. May no longer be established in Bermuda; no specimens in BDAF collection, and no sightings in recent years.

Monomorium pharaonis (L.)

Pharaoh Ant. (Wheeler 1906, Ogilvie 1928). According to Ogilvie (1928), a common house species; listed by earlier collectors as *M. minutum*. Cosmopolitan; not an important household pest in Bermuda in recent years.

Monomorium sp.

(Crowell 1968). First reported by Crowell (1968); one specimen in BDAF collection Spittal Pond, Smith's Parish, Sept. 1987, with sweepnet.

Ochetomyrmex auropunctatus (Roger)

Little Fire Ant. (= *Wasmannia auropunctata* Roger; Crowell 1968). First reported St. George's Parish by Crowell (1968); now fairly common. Often nests in trees; capable of stinging; occurs in Florida, California, West Indies, and Central and South America.

Odontomachus brunneus (Patton)

(= *Odontomachus haematodes insularis* Guerin; Wheeler 1906, Ogilvie 1928, Haskins & Haskins 1965, Crowell 1968). Common in 1927; rare by 1968 Crowell (1968). No specimens in BDAF collection; may no longer be established. Occurs in southern USA, West Indies, and Central and South America. *O. insularis* known only from Cuba, Bahamas, and ?Hispaniola.

Paratrechina longicornis (Latreille) New Record

Crazy Ant. Intercepted on plants from Holland July 1971 and *Dahlia* bulbs from Holland Jan. 1987; not established; transported by commerce; pantropical.

Paratrechina vividula (Nylander)

(= *Prenolepis kincaidi* Wheeler; Wheeler 1906, Ogilvie 1928). Wheeler (1906) found amongst grass and attending *Pseudococcus* on sugarcane; known from Mexico and southern USA; no specimens in BDAF collection.

Paratrechina spp.

(Crowell 1968). First reported Crowell (1968) Ferry Point, St. George's Parish; now common and widespread.

Pheidole megacephala (F.)

Bigheaded Ant. (Wheeler 1906, Ogilvie 1928). Ubiquitous in Bermuda; frequently found attending aphids and scale insects and sometimes invades houses (Ogilvie 1928). Still Bermuda's most common ant though displaced in some areas by *I. humilis* (Haskins & Haskins 1965, Crowell 1968). Tropicopolitan species able to propagate rapidly and exterminate indigenous ant fauna (Wheeler 1906).

Tetramorium caespitum L.

(Wheeler 1906, Ogilvie 1928). More likely *T. bicarinatum* (Nylander) (= *T. guineense*) according to Wheeler (1906). No specimens in BDAF collection; misidentified or no longer be established. *T. bicarinatum* is pantropical.

VESPOIDEA

EUMENIDAE

Euodynerus hidalgo hidalgo (Saussure) New Record

Rare in Bermuda. Collections on Nonsuch Is., St. George's parish, July 1963; Cobb's Hill, Warwick Parish, 1955; and Elbow Beach Area, Paget Parish, 1955. Common throughout eastern USA.

Stenodynerus bermudensis (Bequaert)

(Bequaert 1929). Rare endemic species. Collections Nonsuch Is., St. George's Parish, Aug. 1967, and Serpentine Rd., Pembroke Parish, June 1970.

VESPIDAE

Polistes carolina (L.)

(= *P. carolinus*, Richards 1978). Intercepted at airport 1972; eastern USA.

Polistes fuscatus fuscatus (F.)

(Richards 1978; = *P. fuscatus* (F.), Bequaert 1929; = *P. bellicosus* Cress., *P. palipes* Lep., *P. perplexus* Cress.; Ogilvie 1928). Known locally as "red bee"; common during summer and fall. Nests usually fastened to branches of wild sage (*Lantana* spp.); common North American species.

Vespa arenaria F.

(Bequaert 1929). One specimen collected by J. M. Jones in Bermuda late 1800's; not established; common throughout northern North America.

POMPILOIDEA

POMPILIDAE

Anoplius bermudensis (Banks)

(Banks 1938, = *Psammochares funereus* Lep., *P. philadelphicus* Lep., and *P. scelestus* Cress.; Ogilvie 1928). Once common on sandy banks (Ogilvie 1928). Endemic; recent collections Spittal Pond, Smith's Parish and Warwick Pond, Warwick Parish in grasses near ponds using sweepnet.

SPHECOIDEA

SPHECIDAE

Chalybion cyaneum (Klug)

(Bequaert 1929). No specimens in BDAF collection; common mud-dauber in eastern USA. Originally misidentified or no longer established.

Liris sp. New Record

Three specimens in BDAF collection: Flatts, Hamilton Parish, Oct. 1968; two intercepted in soil from West Indies Oct. 1948.

Mimesa sp.

(Ogilvie 1928, Bequaert 1929). Reported by early collectors but not after 1921; probably no longer established.

Sceliphron caementarium (Drury)

(Ogilvie 1928, Bequaert 1929, = *S. fasciatum* St. Farg.; Ogilvie 1928). Reported to be most common mud-dauber wasp in Bermuda (Ogilvie 1928). No longer common, but still widespread; common in eastern USA.

Sceliphron caeruleum L.

(Ogilvie 1928). Clay nests once found on old walls; provisioned with spiders (Ogilvie 1928). Two specimens in BDAF collection: June 1925, Smith's Parish, and April 1963, no locality given; may no longer be established.

Tachysphex sp. near *ruficaudis* New Record

Two males collected Aug. 1968 Nonsuch Is., St. George's Parish; probably undescribed. *T. ruficaudis* ranges from Argentina to Jamaica, Arizona, and southern California.

APOIDEA

APIDAE

Apis mellifera L.

Honey bee. (Ogilvie 1928). Introduced from England about 1616 (Kevan 1981). In 1988 thirty part-time beekeepers managed 400 hives. Well managed hives yield approximately 55 kg of honey per year. Native to Europe, Asia, and Africa; introduced to all parts of the world.

HALICTIDAE

Halictus semiviridis Friese

(Bequaert 1929, = *Augochlora* sp. and *Halictus* sp.; Ogilvie 1928). Once very common, especially among fennel flowers; not collected or seen this century.

MEGACHILIDAE

Megachile pruina pruina Smith

(= *Megachile* sp.; Ogilvie 1928, = *M. p. bermudensis* Mitchell; Bequaert 1929, Mitchell 1929). Made circular incisions in rose leaves and nested in walls (Ogilvie 1928). No longer present on main islands; survives on Nonsuch, Is., St. George's Parish; utilizes Jamaica dogwood, *Dodonaea viscosa*; also occurs in North Carolina, Georgia, and Florida.

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