Hymenoptera from Midway Atoll

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The present paper reports the Hymenoptera species collected on Midway Atoll, mostly during 1997 by workers associated with the Bishop Museum. Records of a few previously unreported specimens collected on Midway during the 1960s and 1970s also are included as is one new record from an incompletely studied collection made in 1998. All of the Parasitica as well as the family Bethylidae of the Aculeata are treated. The remaining aculeate families will be covered by others. No Symphyta are known to occur on Midway.

The last comprehensive survey of the insects of Midway was by Suehiro (1960). That author reported 35 species of Hymenoptera, 16 in the groups considered here. Based on my examination of the specimens, one of the species listed by Suehiro (Idechthis canescens (Gravenhorst)) represents a misidentification of another species (I. sp.) that is also listed there. Nishida (1997) listed three additional species of Hymenoptera Parasitica for Midway, but he omitted from his list those species determined to genus only in Suehiro’s.

The collections here reported contained the 76 species listed below, and include all but the following two of the species listed from Midway by Nishida (1997); Liriophagus texanus Crawford (Pteromalidae) and Urosigalphus bruchi Crawford (Braconidae). Two species listed by Suehiro (1960) but not by Nishida (1997), Epyris sp. (Bethylidae) and Tetrastichus sp. (Eulophidae), were not represented by voucher specimens in material available for study and were not recognized in recent collections. Whether any of these species are extinct on Midway cannot be presently determined.

Several species included in the following list are represented in the collections available by single specimens, despite the extensive collecting that was done during the 1997 survey. This suggests that these species either were very uncommon, or that the collecting localities and/or techniques utilized were not suitable for obtaining a more adequate sample. Furthermore, if several species were each represented by single specimens in the collections obtained, then it seems likely that others were also present which were missed entirely, and these could have included any or all of the species that were recorded previously from Midway but which were not recollected during this survey.

Certainly, additional Hymenoptera species are present on Midway which are not included in the present list. I have excluded several species because they were represented only by unique, imperfect specimens or by unique specimens of the sex opposite that on which the taxonomy of their group is largely based. Hopefully, additional collecting on Midway may yield specimens of these that can be more readily determined.

Sixty-two of the species listed here are new records for Midway Atoll. None of these are believed to be native to Midway, and this relatively large number of new Midway records probably reflects the increased air and surface traffic between Midway and areas such as the main Hawaiian Islands (where nearly all of these species are known to occur) during the recent past. One species, Dicarnosis ripariensis Kerrich, also is a new state record for Hawai‘i. Whether this species is present on the main Hawaiian Islands has not been determined, but it is unrepresented in extensive collections of Hymenoptera Parasitica that I have examined, which were made on the main islands during the past five years.

Identifications of species listed here were made by me, through comparison with determined specimens in collections of the Bishop Museum and the Hawaii Department of Agriculture (Honolulu), and using available literature. In several instances identification is to genus only, as the species present in the Hawaiian Islands have not yet been authoritatively determined. Voucher specimens are deposited in the Bishop Museum, Honolulu.

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ICHNEUMONOIDEA

Braconidae

*Apanteles carpatus* (Say)

This species was previously recorded from Midway by Suehiro (1960).


*Apanteles* sp.

New island record

This undetermined species is also known from O‘ahu. It is listed from that island as *Apanteles* sp. 2 in Beardsley (1961).


*Chelonus blackburni* Cameron

Previously recorded from Midway by Suehiro (1960).


*Cotesia marginiventris* (Cresson)

New island record

A parasitoid that develops in a wide range of lepidopterous larvae, this species was purposely introduced into the main Hawaiian Islands from Texas in 1942 for biological control of armyworms. It has been reported to be established on most of the main Hawaiian Islands, as well as Laysan (Beardsley, 1961).


*Cotesia plutellae* (Kurdjumov)

New island record

This species was purposely introduced into the main Hawaiian Islands to combat the diamondback moth, *Plutella xylostella* (L.), and was reported to have become established there in 1982 (Lai & Funasaki, 1985).


*Lysiphlebus testaceipes* (Cresson)

A widespread primary parasitoid of aphids; previously recorded from Midway (Nishida, 1997).


*Parallorhogas pallidiceps* (Perkins)

New island record

This species, a common parasitoid of larval cerambycid beetles that is known also from the south Pacific, has been reported from most of the main Hawaiian Islands (Beardsley, 1961).

*Material examined. MIDWAY:* Sand I: 0.5 mi S of Rusty Bucket, 29.vii.1997, G.M. Nishida (1).

*Phanerotoma hawaiiensis* Ashmead

Recorded from Midway by Suehiro (1960).


*Rhaconotus vagrans* (Bridwell) New island record

This parasitoid of larvae of cerambycid beetles occurs on all of the main Hawaiian Islands (Nishida, 1997).


*Ichnneumonidae*  
*Casinaria infesta* (Cresson) New island record

A widespread species that occurs on all of the main Hawaiian Islands (Nishida, 1997).


*Diplazon laetatorius* (Fabricius)  

This widespread parasitoid of aphidophagus syrphid larvae was reported from Midway by Suehiro (1960).


*Venturia* sp.  

This species was listed from Midway by Suehiro (1960) as “*Idechthis* sp. near *canescens*.” It is an as yet unidentified bisexual species that occurs also on O‘ahu and several other of the main Hawaiian Islands (Beardsley & Perreira, unpubl.). The Midway record of *I. canescens* (Gravenhorst) in Suehiro (1960) was based on a misidentification of a specimen of this unidentified species.


**CHALCIDOIDEA**

*Agaonidae*  

*Pleistodontes froggatti* Mayr New island record

This species is the caprifier of *Ficus macrophylla* Desf. (Pemberton, 1921), and is established on the main Hawaiian Islands (Nishida, 1997). If it is established on Midway, that tree must be present there.


*Aphelinidae*  

*Aphytis ?hispanicus* Mercet New island record

This primary parasitoid of armored scale insects has not been listed previously in Hawai‘i. However, it occurs on the main Hawaiian Islands, and may have been confused with *A. diaspidis* Howard, which also occurs there (Beardsley, unpubl.).

Azotus sp.  
New island record
This appears to be the same undetermined species as that listed from O‘ahu by Ni-


Centrodora xiphidii (Perkins)  
New island record
Parasitoid of eggs of Xiphidiopsis lita Hebard (Orthoptera: Tettigoniidae) (Swezey, 1929); it has been reported from most of the main Hawaiian Islands (Nishida, 1997).


Coccophagus ceroplastae (Howard)  
New island record
This is a widespread parasitoid of soft scale insects (Coccidae); it has been reported from most of the main Hawaiian Islands (Nishida, 1997).

Material examined. MIDWAY: Sand I: 15–20.xii.1997, G.M. Nishida, yellow window trap in Bidens patch (1); same data except in Pluchea/Bidens patch (1); same data except in Verbesina patch (2).

Encarsia lounsburyi (Berlese & Paoli)  
New island record
This is a widespread internal parasitoid of armored scale insects, it is known to occur on most of the main Hawaiian Islands (Nishida, 1997).


Encarsia pergandiella Howard  
New island record
This is a parasitoid of Aleyrodidae which is also known from most of the main Hawaiian Islands (Nishida, 1997).


Encarsia sp.  
New island record
This unidentified species is also known from the main Hawaiian Islands (Beardsley, unpubl.).


Eretmocerus sp.  
New island record
Species of this genus are primary parasitoids of Aleyrodidae. The unidentified species recorded here also occurs on the main Hawaiian Islands (Beardsley, unpubl.).


Chalcidae
Antrocephalus apicalis (Walker)  
New island record
This species is recorded from the Kaua‘i and O‘ahu (Nishida, 1997).


Antrocephalus pertorvus (Girault)

Previously recorded from Midway by Suehiro (1960).


Proconura sp. New island record

This is an apparently undescribed species that is also known from several of the main Hawaiian Islands (Beardsley, unpubl.).


Encyrtidae

Adelencyrtus odonaspidis Fullaway New island record

This is a primary parasitoid of a widespread armored scale of grasses, Odonaspis ruthae Kotinsky; no other host is known. The scale and its parasitoid both occur on all the main Hawaiian Islands and on several of the Leeward Islands (Nishida, 1997). Although the scale is not recorded from Midway, it is almost certainly present there.


Apterencyrtus bruchi De Santis New island record

This species is known from Kaua‘i, Moloka‘i, and O‘ahu (Trjapitzin & Beardsley, 1999). The host, presently unknown, probably is a grass-infesting pseudococcid.


Anagyrus swezeyi Timberlake

This is a well known parasitoid of a grass-infesting mealybug, Chorizococcus rosettellum (Lobdell), on the main islands of Hawai‘i (Beardsley, 1969). However, that mealybug has not been reported on Midway. A. swezeyi was previously reported from Midway by Suehiro (1960).

Blepyrus insularis Cameron

This is another widespread mealybug parasitoid. The usual host on the main Hawaiian Islands and elsewhere is Ferrisia virgata (Cockerell) (Beardsley, 1976).


Cheiloneurus sp.

This species is the same as Cheiloneurus sp. 1 of Beardsley (1976), and occurs on most of the main Hawaiian Islands. It is believed to be hyperparasitic in mealybug primary parasitoids.


Coccidoxenoides peregrina (Timberlake)

This primary parasitoid of the citrus mealybug, Planococcus citri (Risso) and related forms, was reported from Midway by Suehiro (1960), under its synonym Pauridia peregrina Timberlake.


Dicarnosis ripariensis Kerrich

The description of this species was based on specimens from southern California, reared from Phenacoccus maderiensis Green, and misidentified as P. gossypi (Townsend & Cockerell) (Kerrich, 1978). This host is widespread, and was reported from Midway (misidentified as P. gossypi) by Suehiro (1960).


Diversinervus elegans Silvestri

This widely distributed parasitoid of Saissetia spp. (Coccidae) was previously reported from Hawai‘i, Maui, O‘ahu, and Midway.


Encyrtus infelix (Embleton)

A widespread parasitoid of soft scales (Coccidae); it occurs on all of the main Hawaiian Islands (Nishida, 1997).


Gyranusoidea phenacoci (Beardsley)

Described from Hawai‘i as a parasitoid reared from Phenacoccus maderiensis Green, misidentified as P. gossypii (Townsend & Cockerell) (Beardsley, 1969). Known previously from O‘ahu, Moloka‘i, and Hawai‘i (Nishida, 1997).

*Leptomastidea abnormis* (Girault)  
New island record  
This is a widely distributed primary parasitoid of the citrus mealybug, *Planococcus citri* (Risso), and related species. It was purposely introduced into the main Hawaiian Islands for biological control of that pest (Beardsley, 1976).


*Metaphycus flavus* (Howard)  
New island record  
A widespread primary parasitoid of soft scale insects (Coccidae) (Beardsley, 1976). This species is an accidental immigrant into Hawai‘i, where it has been reported from Moloka‘i, and O‘ahu (Nishida, 1997).


*Neodusmetia sangwani* (Subba Rao)  
New island record  
This parasitoid of the Rhodes-grass mealybug, *Antonina graminis* (Maskell), has been distributed widely for biological control of that pest (Dean *et al.*, 1979). However, it appears to have been accidentally introduced into Hawa‘i (Beardsley, 1976). It now occurs on most of the main Hawaiian Islands and on Pearl & Hermes Atoll (Nishida, 1997). Rhodes-grass mealybug has not been reported from Midway, although it very probably occurs there.


*Plagiomerus* sp.  
New island record  
This is the same as the unidentified species that was reported for the main Hawaiian Islands, where it was reared from the armored scale *Hemiberlesia lataniae* (Signoret) (Beardsley, 1976).


**Eulophidae**  

*Aprostocetus hagenowi* (Ratzeburg)  
New island record  
This species develops in the eggs of cockroaches (e.g., *Periplaneta* spp.). It has been reported from most of the main Hawaiian Islands (Nishida, 1997).


*Aprostocetus* sp.  
New island record  
This species has been reported from O‘ahu and Hawai‘i (Beardsley, 1991a) where it develops as a pupal parasitoid of the tephritid fly *Dioxyna sorocula* (Wiedemann) in seed heads of *Bidens pilosa* L.


*Elachertus advena* Timberlake  
Recorded from Midway by Suehiro (1960).


**Hemiptarsenus semialbiclavus** (Girault)  
New island record  
A widespread parasitoid of leaf-mining larvae; known from the main Hawaiian Islands, Nihoa, and French Frigate Atoll (Nishida, 1997).


**Neochrysocharis formosa** (Westwood)  
New island record  
This parasitoid of agromyzid leafminers has been reported from most of the main Hawaiian Islands (Nishida, 1997).


**Neotrichoporoides viridimaculata** (Fullaway)  
New island record  
This widespread species, described originally from Hawai’i but believed to be an accidental introduction there, is known from Hawai’i and O’ahu (Nishida, 1997). It is associated with Bermuda grass and may be phytophagus (Beardsley, unpubl.).


**Tetrastichus beardsleyi** Fullaway  
New island record  
This species is believed to be an accidental introduction into Hawai’i, although as yet unreported elsewhere (Nishida, 1997). It was described from O’ahu, but has been found also on Moloka’i (Beardsley & Perreira, unpubl.), and probably occurs on all of the main Hawaiian Islands. It is commonly associated with Bermuda grass.


**Eupelmidae**  

**Anastatus koebelei** Ashmead  
New island record  
This species is known also from the main Hawaiian Islands (Nishida, 1997), and has been reported as a parasitoid of tettigonid eggs (Swezey, 1929).

Eurytomidae
Tetramesa sp. New island record/name change
This species is the same as “Harmoletia sp. 1” of Beardsley (1991b) from O’ahu and Moloka‘i. It appears to be an accidental immigrant into Hawai‘i, of unknown origin.


Mymaridae
Anagrus frequens Perkins New island record
This parasitoid was purposely introduced into the main Hawaiian Islands in 1904 for biological control of the delphacid planthopper Perkinssiella saccharicida Kirkaldy. It develops in the eggs of this and other Delphacidae (Trjapitzin & Beardsley, in press).


Anagrus nigriventris Girault New island record
This accidentally introduced species was first found in the main Hawaiian Islands around 1930, and has been reared from the eggs of a widespread cicadellid leafhopper, Empoasca solana DeLong (Trjapitzin & Beardsley, in press).


Anaphes calendrae (Gahan) New island record
This species was purposely introduced into the main Hawaiian Islands to combat sphenophorine weevil pests. It was not reported to be established there until 1997 (Beardsley, in press).


Camptoptera sp. New island record
This species also occurs on the main Hawaiian Islands where it apparently is a previously unreported accidental immigrant. It is listed as Camptoptera sp. 1 by Beardsley & Huber (in press).


Gonatocerus sp. New island record
This species also is found on the main Hawaiian Islands where it apparently is an accidental immigrant; the first known collection was made in 1961. It is the same as Gonatocerus sp. 2 of Huber & Beardsley (in press).


Gonatocerus sp., membraciphagus group New island record
This species has been known in the main Hawaiian Islands since 1955 (Huber & Beardsley, in press), and appears to be an accidental immigrant there. It is a parasitoid in eggs of membracid treehoppers.


**Gonatocerus ornatus** Gahan

New island record

This species, a parasitoid in the eggs of the widespread membracid *Spissistilus festinata* (Say), is known also from O‘ahu where it was first collected in 1938; a presumed accidental immigrant (Huber & Beardsley, in press).

**Material examined. MIDWAY:** Sand I: Henderson & Halsey Drives, 14.iv.1997, L. Patrick, Malaise (1).

**Stephanodes reduvioli** (Perkins)

This species was recorded from Midway as *Polynema reduvioli* Perkins by Suehiro (1960). Nishida (1997) listed it as *Stephanodes similis* (Foerster), but I consider this a misidentification as *reduvioli* has never been formally synonymized with *similis*. *Stephanodes reduvioli* develops as a parasitoid in eggs of *Nabis capsiformis* (Germar) and is recorded from most of the main Hawaiian islands (Swezey, 1929).


**Pteromalidae**

**Chlorocytus longiscapus** Gahan

New island record

This species occurs also on several of the main Hawaiian Islands and is a previously unreported accidental immigrant there (determination by C.M. Yoshimoto). It has been reared from larvae of agromyzid leafminers (Beardsley, unpubl.).


**Halticoptera circulus** (Walker)

New island record/name change

Nishida (1997) listed this widespread parasitoid of agromyzid leafminer larvae from the main Hawaiian Islands as *H. patellana* (Dalman), which appears to be a misidentification of long standing.


**Heteroschema** sp.

New island record

This parasitoid has been reared from larvae of *Melanagromyza virens* (Loew) on O‘ahu (Beardsley, 1956). It is most likely *Heteroschema punctata* (Ashmead), but this requires confirmation. Nishida (1997) recorded it from O‘ahu, Maui and Hawai‘i.

Spalangia cameroni  Perkins  
**New island record**
Adults of this parasitoid emerge from puparia of muscoid Diptera. It is a widespread species described originally from Hawai‘i (Perkins, 1910) and has been reported from most of the main Hawaiian Islands.

*Material examined.* **MIDWAY:** Sand I: golf course, 2.v.1998, G.M. Nishida, sweeping mixed weeds (2).

Signiphoridae  
**Signiphora** sp.  
**New island record**
This may be *Signiphora aspidioti* Ashmead, a hyperparasitoid in armored scale insects that is recorded from both O‘ahu and Necker (Nishida, 1997), but is widespread.


Trichogrammatidae  
**Oligosita** sp.  
**New island record**
Several species of this genus occur on the main Hawaiian Islands.


Trichogramma  sp.  
**New island record**
A male and a female of what appears to be a single species of this genus were taken during this survey. It is believed to be one of several non-native *Trichogramma* that are known from the main Hawaiian Islands (Oatman et al., 1982), but I am unable to place the species with certainty.


Uscana  sp.  
**New island record**
This appears to be the same as a species from the main Hawaiian Islands that is known as *Uscana semifumipennis* Girault (Nishida, 1997), but I am not certain


Cynipoidea  
Eucoilidae  
**Gronotoma micromorpha** (Perkins)  
**New island record**
This species is a parasitoid of larvae of agromyzid leafminers. It has been recorded from the main Hawaiian Islands, Guam, and Florida (Beardsley, 1988).


Evaniidae  
**Evania appendigaster** (L.)  
This widespread species develops in the oothecae of cockroaches such as *Periplaneta* spp. It was reported from Midway by Suehiro (1960).

PROCTOTRUPOIDEA
Diapriidae

*Trichopria* sp. New island record

This appears to be the same as an unidentified species from the main Hawaiian Islands (Beardsley, unpubl.).


CERAPHRONOIDEA
Ceraphronidae

*Ceraphron plebeius* Perkins New island record

This species was described from the Hawaiian Islands and has been recorded from Kaua‘i and O‘ahu (Nishida, 1997).


*Ceraphron* sp. New island record

This undetermined species appears to be the same as one known from O‘ahu and Moloka‘i (Beardsley, unpubl.).


SCELIONOIDEA
Platygastridae

*Fidiobia* sp. New island record

This species appears to be the same as one recorded from the main Hawaiian Islands (Nishida, 1997).


Scelionidae

*Anteromorpha dubiosa* (Perkins) New island record

This appears to be an accidental introduction into Hawai‘i and has been reported from O‘ahu and Maui (Nishida, 1997); its host is unknown.


Encyrtoscelio sp. New island record

Members of this genus develop as parasitoids in eggs of cydnid burrowing bugs. This unidentified species also is known from Kaua‘i and O‘ahu (Beardsley, 1989; Nishida, 1997).


*Idris ‘peregrinus’* (Perkins) New island record

This species was described from O‘ahu; type locality Honolulu (Perkins, 1910); the host is unknown. The specimen listed below is tentatively placed here, pending comparison with the holotype.


*Telenomus nawai* Ashmead

This species develops as a parasitoid in the eggs of armyworms (Noctuidae) (Swezey, 1929). It was recorded from Midway by Nishida (1997).

*Telenomus vulcanus* Perkins

New island record

This species is recorded from Hawai‘i and Laysan (Nishida, 1997), but probably occurs on all Hawaiian Islands. It develops as a parasitoid in eggs of *Nysius* spp. (Lygaeidae) (Swezey, 1929).


*Telennosus* sp.

New island record

This species is present in the main Hawaiian Islands where it has been reared from eggs of *Zelus renardii* Kolenati (Reduviidae) (Beardsley, unpubl.).


BETHYLOIDEA

Bethylidae

*Sierola* sp.

New island record

*Sierola* spp. develop as parasitoids of larvae of Lepidoptera.


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Literature Cited


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