

Hymenoptera from Midway Atoll¹

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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 Bethyridae 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. (Bethyridae) 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).

Material examined. **MIDWAY:** Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (1).

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).

Material examined. **MIDWAY:** Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (1).

***Chelonus blackburni* Cameron**

Previously recorded from Midway by Suehiro (1960).

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.iv.1997, L. Patrick (2); same data except 14.iv.1997 (1).

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).

Material examined. **MIDWAY:** Sand I: 28.i.1964, C.F. Clagg, at light (1).

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).

Material examined. **MIDWAY:** Sand I: E., 17.v.1997, G.M. Nishida (3); Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (2); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (36); same data except 10.iv.1997, L. Patrick (3); same data but 14.iv.1997 (6); Sand I: Interior, 16.v.1997, G.M. Nishida (1); Sand I: Roosevelt & Halsey Drives, G.M. Nishida, Malaise (23).

***Lysiphlebus testaceipes* (Cresson)**

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

Material examined. **MIDWAY:** Sand I: Citrus grove, 19.xii.1997, G.M. Nishida, sweeping flowering clover (2).

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).

Material examined. **MIDWAY:** Sand I: near Bulky Dump, 16.ii.1997, A. Asquith, under logs & sweeping *Gnaphalium* (1); Sand I: Dump lake, 18.ii.1997, G.M. Nishida, ex flowering *Pluchea* (1); Sand I: Dump lake, 31.viii.1997, G.M. Nishida, at UV light (4); Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (1); Sand I: NE of Frigate Point, 28.viii.1997, G.M. Nishida, at

UV light (7); Sand I: Henderson Drive at airstrip, 28.viii.1997, G.M. Nishida, sweeping *Bidens* (1); Sand I: Henderson & Roosevelt Drives, 28.viii.1997, G.M. Nishida, at UV light (9); Sand I: Roosevelt Drive, 15.ii.1997, A. Asquith, ex *Malva*, *Leucaena*, *Casuarina* (1); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1).

Rhaconotus vagrans* (Bridwell)*New island record**

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

Material examined. **MIDWAY:** Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (3); Sand I: Roosevelt Drive, 15.ii.1997, A. Asquith, ex *Malva*, *Leucaena*, *Casuarina* (1); Sand I: Roosevelt & Halsey Drives, 17.ii.1997, sweeping *Poinsettia* (1); Sand I: W. Beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (3).

Ichneumonidae***Casitaria infesta* (Cresson)****New island record**

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

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (3); same data except 10.iv.1997, L. Patrick (1).

***Diplazon laetatorius* (Fabricius)**

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

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (7); same data except 10.iv.1997, L. Patrick (1); same data except 14.iv.1997 (1).

***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.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (8); same data except 10.iv.1997, L. Patrick (5); same data but 14.iv.1997 (3); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida & L. Patrick, Malaise (2).

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.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

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.).

Material examined. **MIDWAY:** Sand I: Henderson Ave., 15–20.xii.1997, G.M. Nishida, yellow window trap amongst *Malva*/*Acacia* trees (4); Sand I: Henderson & Halsey Drives, 14.iv.1997, L. Patrick, Malaise (1).

Azotus sp.**New island record**

This appears to be the same undetermined species as that listed from O'ahu by Nishida (1997). *Azotus* species are hyperparasites in armored scale insects.

Material examined. MIDWAY: Sand I: 15–20.xii.1997, G.M. Nishida, yellow window trap (1); Sand I: central, 13–15.viii.1997, A. Gall, Malaise (1). Sand I: Dump Lake, 17.xii.1997, G.M. Nishida, sweeping Bermuda grass (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (2); same data except 10.iv.1997, L. Patrick, (1); same data except 14.iv.1997 (6); Sand I: Roosevelt & Halsey Aves., 1–17.v.1997, G.M. Nishida & L. Patrick, Malaise (2).

Centroдора 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).

Material examined. MIDWAY: Sand I: Henderson & Halsey Aves., 10.iv.1997, L. Patrick, Malaise (2); same data except 14.iv.1997 (3).

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: Frigate Point, 17.xii.1997, G.M. Nishida, sweeping *Hibiscus* (1); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (3); Sand I: W. Beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (2).

Encarsia lounsburyi (Berlese & Paoli)**New island record**

A widespread internal parasitoid of armored scale insects, it is known to occur on 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 pergandiella Howard**New island record**

This is a parasitoid of Aleyrodidae which is also known from most of the main Hawaiian Islands (Nishida, 1997).

Material examined. MIDWAY: Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (6); same data except 14.iv.1997, L. Patrick (3); Sand I: Inner Harbor area, 12–13.v.1997, Malaise (1); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida & G.A. Samuelson, Malaise (2).

Encarsia sp.**New island record**

This unidentified species is also known from the main Hawaiian Islands (Beardsley, unpubl.).

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

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.).

Material examined. MIDWAY: Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (3); same data except 10.iv.1997, L. Patrick (1); same data except 14.iv.1997 (10); Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1).

Chalcididae*Antrocephalus apicalis* (Walker)**New island record**

This species is recorded from the Kaua'i and O'ahu (Nishida, 1997).

Material examined. MIDWAY: Sand I: near Bulky Dump, 16.ii.1997, A. Asquith, under logs & sweeping *Gnaphalium* (2); Sand I: E. peninsula, 14.ii.1997, G.M. Nishida, sweeping *Verbesina* (1);

Sand I: Frigate Point, 28.viii.1997, G.M. Nishida, sweeping mostly grass (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.iv.1997, L. Patrick (1); same data except 14.iv.1997 (3); Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida & L. Patrick, Malaise (1).

***Antrocephalus pertorvus* (Girault)**

Previously recorded from Midway by Suehiro (1960).

Material examined. **MIDWAY:** Sand I: near Bulky Dump, 16.ii.1997, A. Asquith, under logs & sweeping *Gnaphalium* (2); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 14.iv.1997, L. Patrick (2); Roosevelt Drive, 15.ii.1997, A. Asquith, ex *Malva*, *Leucaena*, *Casuarina* (3); Sand I: Roosevelt Drive, 28.viii–3.ix.1997, G.M. Nishida, yellow sticky trap (2); Sand I: S. of Rusty Bucket, 28.viii–3.ix.1997, G.M. Nishida, yellow sticky trap (1).

***Proconura* sp.**

New island record

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

Material examined. **MIDWAY:** Sand I: near Bulky Dump, 16.ii.1997, A. Asquith, sweeping *Gnaphalium* (1); same locality but 17.ii.1997, G.M. Nishida, sweeping foliage at night (1); Sand I: Frigate Point, 28.viii.1997, G.M. Nishida, sweeping mostly grass (2); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (2); same data except 10.iv.1997, L. Patrick (5); same data except 14.iv.1997 (2); Sand I: residential area, 16.v.1997, G.M. Nishida, sweeping Bermuda grass (1); Sand I: Roosevelt Drive, 15.ii.1997, A. Asquith, ex *Malva*, *Leucaena*, *Casuarina* (1); Sand I: Roosevelt & Halsey Drives, 17.v.1997, G.M. Nishida, Malaise (2); Sand I: 0.5 mi S. of Rusty Bucket, 29.viii.1997, G.M. Nishida, sweeping *Bidens* (2); Sand I: S. central, 16.ii.1997, G.M. Nishida, sweeping *Cyperus* (1); Sand I: W. of deep water harbor, 14.ii.1997, G.M. Nishida (1).

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.

Material examined. **MIDWAY:** Eastern I: 15.v.1997, G.M. Nishida, on Bermuda grass (1); Sand I: Dump Lake, 17.xii.1997, G.M. Nishida, sweeping Bermuda grass (2); same data but 19.xii.1997 (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (3); same data except 14.iv.1997, L. Patrick (6); Sand I: residential area, 16.v.1997, G.M. Nishida, sweeping Bermuda grass (1); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (3).

***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.

Material examined. **MIDWAY:** Sand I: Harbor area, 13.v.1997, G.M. Nishida, sweeping mostly grass (1); Sand I: S.E., 16.v.1997, G.M. Nishida, sweeping *Bidens* (2).

***Anagyrus swezeyi* Timberlake**

This is a well known parasitoid of a grass-infesting mealybug, *Chorizococcus rostellum* (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).

Material examined. **MIDWAY:** Sand I: Dump Lake, 19.xii.1997, G.M. Nishida, sweeping Bermuda grass (3); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.iv.1997, L. Patrick (2); same data except 14.iv.1997 (4); Sand I: inner harbor area, 12–13.v.1997, G.M. Nishida, Malaise (2); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M.

Nishida, Malaise (17); Sand I: S. central, 16.ii.1997, G.M. Nishida, sweeping grass (3); Sand I: W. Beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (2).

***Blepyrus insularis* Cameron** **New island record**

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

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (2); Sand I: Henderson & Roosevelt Drives, 15.ii.1997, G.M. Nishida, yellow pan trap (1); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1); same data except G.M. Nishida & L. Patrick (1).

***Cheiloneurus* sp.** **New island record**

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.

Material examined. **MIDWAY:** Sand I: central, 13–15.viii.1997, A. Gall, Malaise (1); Sand I: residential area, 16.v.1997, G.M. Nishida, sweeping Bermuda grass (1); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1); same data except G.M. Nishida & L. Patrick (1); Sand I: S. central, 16.ii.1997, G.M. Nishida, sweeping grass (1).

***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.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1).

***Dicarnosis ripariensis* Kerrich** **New state record**

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

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (10); same data except 10.iv.1997, L. Patrick (11); same data except 14.iv.1997 (14); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (8); same data except G.M. Nishida & L. Patrick (4); Sand I: S.E., 16.v.1997, G.M. Nishida, sweeping *Bidens* (1).

***Diversinervus elegans* Silvestri**

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

Material examined. **MIDWAY:** Eastern I: 15.ix.1964, J.W. Beardsley, sweeping (2); Sand I: nr. Frigate Point, 17.xii.1997, G.M. Nishida, sweeping *Hibiscus* (1).

***Encyrtus infelix* (Embleton)** **New island record**

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

Material examined. **MIDWAY:** Sand I: 13–17.xii.1970, J.L. Gressitt, Malaise (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.vi.1997, L. Patrick (1); Sand I: SE., 18.v.1997, G.M. Nishida, sweeping *Bidens* (1).

***Gyranusoidea phenacocci* (Beardsley)** **New island record**

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).

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (2); same data except 10.iv.1997, L. Patrick (6); same data except 14.iv.1997 (10); Sand I: Roosevelt & Halsey Aves., 1–17.v.1997, G.M. Nishida, Malaise (6); same data except G.M. Nishida & L. Patrick (2).

***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).

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (2).

***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).

Material examined. **MIDWAY:** Sand I: 15–20.xii.1997, G.M. Nishida, yellow window trap in *Bidens* patch (1); Sand I: W. Beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

***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 Hawai'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.

Material examined. **MIDWAY:** Sand I: Dump Lake, 17.xii.1997, G.M. Nishida, sweeping Bermuda grass (1).

***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).

Material examined. **MIDWAY:** Sand I: Citrus grove, 19.xii.1997, G.M. Nishida, sweeping flowering clover (3); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (5).

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).

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

***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 *Dioxya sorocula* (Wiedemann) in seed heads of *Bidens pilosa* L.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Drives, 14.iv.1997, L. Patrick, Malaise (2).

***Elachertus advena* Timberlake**

Recorded from Midway by Suehiro (1960).

Material examined. **MIDWAY:** Sand I: Dump Lake, 18.ii.1997, G.M. Nishida, ex flowering

Pluchea (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.iv.1997, L. Patrick (4); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (10); same data except G.M. Nishida & L. Patrick (4); Sand I: Roosevelt Drive, 15.ii.1997, A. Asquith, ex *Malva*, *Leucaena*, *Casuarina* (1).

***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).

Material examined. **MIDWAY:** Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (1); Sand I: Frigate Point, 28.viii.1997, G.M. Nishida, sweeping mostly grass (1); Sand I: golf course, 13.v.1997, G.M. Nishida, sweeping *Portulaca*-like plant (2); Sand I: (no locality), 15–20.xii.1997, G.M. Nishida, yellow window trap in *Scaevola* stand (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (7); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (15); Sand I: SE., 16.v.1997, G.M. Nishida, sweeping *Bidens* (1); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (7).

***Neochrysocharis formosa* (Westwood) New island record**

This parasitoid of agromyzid leafminers has been reported from most of the main Hawaiian Islands (Nishida, 1997).

Material examined. **MIDWAY:** Sand I: Citrus grove, 19.xii.1997, G.M. Nishida, sweeping flowering clover (1); Sand I: Dump Lake, 19.ii.1997, G.M. Nishida, sweeping Bermuda grass (1); Sand I: E. peninsula, 18.ii.1997, G.M. Nishida, sweeping *Verbesina* (2); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (48); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (21).

***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 phytophagous (Beardsley, unpubl.).

Material examined. **MIDWAY:** Sand I: Dump Lake, 19.xii.1997, G.M. Nishida, sweeping Bermuda grass (3); Sand I: Henderson & Halsey Drives, 14.iv.1997, L. Patrick, Malaise (1); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

***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.

Material examined. **MIDWAY:** Sand I: Dump Lake, 19.xii.1997, G.M. Nishida, sweeping Bermuda grass (3); Sand I: golf course, 19.xii.1997, G.M. Nishida, sweeping *Chloris* (4).

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 tettigoniid eggs (Swezey, 1929).

Material examined. **MIDWAY:** Sand I: nr. Bulky Dump, 16.ii.1979, A. Asquith, under logs and sweeping *Gnaphilium* (1); Sand I: central, 13–15.viii.1997, A. Gall, Malaise (2); Sand I: E. peninsula, 18.ii.1997, G.M. Nishida, sweeping *Verbesina* (1); Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (3); same data except 10.iv.1997, L. Patrick (3); same data except 14.iv.1997 (2); Sand I: Roosevelt Drive, 15.ii.1997, A. Asquith, ex *Malva*, *Leucaena*, *Casuarina* (2); Sand I: Roosevelt & Halsey Drives, 29.viii–3.ix.1997, G.M. Nishida, yellow sticky trap (1); Sand I: Roosevelt & Halsey Drives, 17.ii.1997, G.M. Nishida (2); Sand I: betw. seaplane hanger & Hennessy Dr., 14.ii.1997, A. Asquith, on *Pluchea* (6); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

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.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.iv.1997, L. Patrick (1).

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 *Perkinsiella saccharicida* Kirkaldy. It develops in the eggs of this and other Delphacidae (Trjapitzin & Beardsley, in press).

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (42); same data except 14.iv.1997, L. Patrick (30); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (2).

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).

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 10.iv.1997, L. Patrick, Malaise (5); same data except 14.iv.1997 (49); Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (6); same data except G.M. Nishida & L. Patrick (3).

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).

Material examined. **MIDWAY:** Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

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).

Material examined. **MIDWAY:** Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

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).

Material examined. **MIDWAY:** Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

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.

Material examined. **MIDWAY:** Sand I: 13–17.xii.1970, J.L. Gressitt, Malaise (9); Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (1); Sand I: harbor area, 13.v.1997, G.M. Nishida, sweeping mostly grass (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (12); same data except 10.iv.1997, L. Patrick (17); same data except 14.iv.1997 (5); Sand I:

W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (5); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1).

***Gonatocerus ornatus* Gahan** **New island record**

This species, a parasitoid in the eggs of the widespread membracid *Spissistilus festina* (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).

Material examined. **MIDWAY:** Sand I: golf course, 13.v.1997, G.M. Nishida, sweeping *Portulaca*-like plant (1); Sand I: harbor area, 13.v.1997, G.M. Nishida, sweeping mostly grass (1); Sand I: Henderson & Halsey Drives, 14.iv.1997, L. Patrick, Malaise (3); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (2); same data except G.M. Nishida & L. Patrick (2).

Pteromalidae

***Chlorocytyus 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.).

Material examined. **MIDWAY:** Eastern I: 13–16.v.1997, G.M. Nishida, yellow pan trap (1); Sand I: (no specific locality), 15–20.xii.1997, G.M. Nishida, yellow window trap in *Verbesina* patch (1); Sand I: E. peninsula, 14.ii.1997, G.M. Nishida, sweeping *Verbesina* (1); Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (16); Sand I: inner harbor area, 12–13.v.1997, G.M. Nishida, Malaise (1); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (2).

***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.

Material examined. **MIDWAY:** Eastern I: 13–16.v.1997, G.M. Nishida, yellow pan trap (2); Eastern I: 13.v.1997, G.M. Nishida, sweeping sweet alyssum (2); Eastern I: 14.v.1997, G.M. Nishida (1); Sand I: E., 17.v.1997, G.M. Nishida (2); Sand I: Frigate Point, 13–18.ii.1997, G.M. Nishida & A. Asquith, Malaise (8); Sand I: Henderson Drive at airstrip, 28.viii.1997, sweeping *Bidens* (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (12); same data except 10.iv.1997, L. Patrick (2); same data except 14.iv.1997 (6); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (10); Sand I: SE., 16.v.1997, G.M. Nishida, sweeping *Bidens* (2).

***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.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 10.iv.1997, L. Patrick, Malaise (2); same data except 14.iv.1997 (2); Sand I: betw. seaplane hanger & Hennessey Ave., 14.ii.1997, A. Asquith, on *Pluchea* (1).

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 aspidiotti* Ashmead, a hyperparasitoid in armored scale insects that is recorded from both O'ahu and Necker (Nishida, 1997), but is widespread.

Material examined. **MIDWAY:** Sand I: 15–20.xii.1997, G.M. Nishida, yellow window trap in *Hibiscus/Coccoloba* stand (1).

Trichogrammatidae***Oligosita* sp.****New island record**

Several species of this genus occur on the main Hawaiian Islands.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.iv.1997, L. Patrick (1).

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.

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (2).

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

Material examined. **MIDWAY:** Sand I: Henderson Ave, 15–20.xii.1997, G.M. Nishida, yellow window trap amongst *Malva/Acacia* trees (2); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

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).

Material examined. **MIDWAY:** Sand I: E., 17.v.1997, G.M. Nishida (12); Sand I: golf course, 17.v.1997, sweeping *Portulaca*-like plant (4); Sand I: harbor area, 13.v.1997, G.M. Nishida, sweeping mostly grass (5); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (20); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (41); Sand I: Roosevelt & Halsey Drives, 15.ii.1997, G.M. Nishida, sweeping *Poinsettia* (2); same data except 17.ii.1997, sweeping *Verbesina* (2); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (15).

EVANIOIDEA**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).

Material examined. **MIDWAY:** Sand I: Bulky Dump, 31.viii.1997, G.M. Nishida, in flight (1); Sand I: Frigate Point, 28.viii.1997, G.M. Nishida (1).

PROCTOTRUPOIDEA

Diapriidae*Trichopria* sp.**New island record**

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

Material examined. **MIDWAY:** Sand I: Roosevelt Drive, 15.ii.1997, A. Asquith, *Casuarina* (1); Spit I: N. end, 16.ii.1997, A. Asquith, under logs (14).

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).

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 10.iv.1997, L. Patrick, Malaise (13); same data except 14.iv.1997 (2); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (2).

Ceraphron sp.**New island record**

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

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (15); same data except 10.iv.1997, L. Patrick (1); same data except 14.iv.1997 (4); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1).

SCELIONOIDEA

Platygasteridae*Fidiobia* sp.**New island record**

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

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 14.iv.1997, L. Patrick (1).

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.

Material examined. **MIDWAY:** Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1).

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).

Material examined. **MIDWAY:** Sand I: central, 12–15.viii.1997, A. Gall, Malaise (5).

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.

Material examined. **MIDWAY:** Sand I: Dump Lake, 17.xii.1997, G.M. Nishida, sweeping Bermuda grass (1).

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).

Material examined. **MIDWAY:** Sand I: Henderson & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (3).

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).

Material examined. **MIDWAY:** Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (3); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

Telenomus* 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.).

Material examined. **MIDWAY:** Sand I: Henderson Ave., 15–20.xii.1997, G.M. Nishida, yellow window trap among *Malva/Acacia* trees (1); Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (1); same data except 10.iv.1997, L. Patrick (2); same data except 14.iv.1997 (2); Sand I: Roosevelt & Halsey Drives, 1–17.v.1997, G.M. Nishida, Malaise (1).

BETHYLOIDEA**Bethylidae*****Sierola* sp.****New island record**

Sierola spp. develop as parasitoids of larvae of Lepidoptera.

Material examined. **MIDWAY:** Sand I: Henderson Ave., 15–20.xii.1997, G.M. Nishida, yellow window trap among *Malva/Acacia* trees (1); Sand I: Sand I: Henderson & Halsey Aves., 6.iii.1997, N. Seto, Malaise (3); Sand I: W. beach, 15–20.xii.1997, G.M. Nishida & G.A. Samuelson, Malaise (1).

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