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**DIPTERA (INSECTA) OR TRUE FLIES OF THE PITCAIRN GROUP
(DUCIE, HENDERSON, OENO, AND PITCAIRN ISLANDS)**

BY

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ABSTRACT

An annotated checklist of the Diptera or true flies of the Pitcairn Group (southeastern Polynesia) with emphasis on the fauna of Henderson Island is presented. Although 59 species of Diptera are reported here, which is a substantial increase in the number of species that was known earlier, the fauna must still be considered depauperate. As is typical of oceanic islands of eastern Polynesia, the Pitcairn-Group fauna lacks many taxonomic groups. Most of the species apparently dispersed to the Pitcairn Group from other islands to the west and north, primarily within Polynesia. Only five species are apparently endemic to the Pitcairn Group, and with better sampling, even these may be found elsewhere. Two species, an otitid and a calliphorid, were known previously only from the neotropics.

INTRODUCTION

Remote and exotic, the islands of the Pitcairn Group are poorly known, especially their natural history. Our meager knowledge of them is due largely to their remoteness, which, ironically, now makes them inviting to study because their fauna and flora are relatively undisturbed. Only Pitcairn, of *Mutiny on the Bounty* fame, has been inhabited in recent times, and of the four islands comprising the Group, it alone bears the lasting imprint of human disturbance. The Pitcairn Group lies in the South Pacific along the southern boundary of Polynesia between 23-25° south latitude and 124-131° west longitude. Besides Pitcairn, which is a geologically recent volcanic island, the other islands of the Pitcairn Group are Ducie and Oeno, both low-lying atolls, and Henderson, a raised atoll.

Although remote and poorly known, the Pitcairn Group has not been totally bypassed by man, least of all Pitcairn. During the past decade, for example, an American millionaire attempted first to buy and then to lease Henderson Island, the largest island of the Group. The intent of the procurement was to establish a small settlement and construct an airfield among other developments. Through the lobbying efforts of the Royal Society of England and the Smithsonian Institution, the procurement of Henderson Island was thwarted, and Henderson has now been proposed as a world heritage site to better preserve its unique geological features and depauperate fauna and flora. A history of Henderson Island, including a summary of all previous work on the natural history of the island, was recently published by Fosberg, et al. (1983).

To better document the unique natural history of the Pitcairn Group, a Smithsonian-sponsored expedition visited these islands in 1987. The purposes of the expedition were: to conduct biological and geological reconnaissance of the islands and to gather data that are needed to determine the feasibility of more long-term research on the islands. The efforts of the Smithsonian team were primarily focused on Henderson Island because of recent threats to its conservation, its unique geology, and its much larger size.

Because of complex logistics, limited budgets, and tight schedules, the reconnaissance work was restricted to brief stays on each of the islands. Our visits to Ducie and Oeno atolls were for a few hours on the afternoons of May 10th and 28th respectively. Nine days were devoted to Henderson (May 12-21), and four days were spent on Pitcairn (May 22-26).

As documented in Fosberg, et al., the insects of Henderson Island are virtually unknown. Less than 35 species in five orders had been recorded prior to our survey, and of these, only two were dipterans, *Dacus setinervis* Malloch and *Atherigona hendersoni* Malloch. The Diptera of the other islands are no better known. Thus, the purpose of this paper is to report on the Diptera or true flies of the Pitcairn Group that were collected on the Smithsonian expedition.

Although only two dipterous species had been reported previously from Henderson Island, we anticipated the discovery of many more. Herein, nearly 60 species are treated, and although this represents a major increase in the number of species recorded for these islands, many additional species will undoubtedly be discovered as these islands are further sampled for longer periods of time, at different seasons, and using different collecting techniques. We collected Diptera with an aerial net and a Malaise trap that was sometimes baited.

For each species treated, the following information is provided: the name of the species plus its author, year, and page of publication; immediately following these data and continuing on the same line is the name of the person who made the species determination (the author made the identification if no one is noted) and major references to the species. Thereafter as information is available are sections on "Specimens Examined" (distribution on islands of the Pitcairn Group, including the number and gender of the specimens; specimens are deposited in the USNM unless noted otherwise) and "Distribution" (generalized account of a species distribution). Information on the natural history and other comments as available and appropriate are included under a "Remarks" section.

Gustav Paulay and I were the two entomologists on the Smithsonian team, and most of the insects, including all of the Diptera, were collected by us. Determinations of species are as authoritative as possible short of revising each group to which a species belongs. For a few species, primary types were examined, but for most identifications, I relied on the expertise of specialists.

On Henderson Island, we sampled two primary sites as follows: the NW Beach from May 12-20 and the North Beach from May 17-20. From these two beaches, we made short excursions inland to a few more sites, but even the more productive of these were within the vicinity of the beaches. The inland sites will be noted more specifically in the "Specimens Examined" section for each species.

Two primary sites were sampled on Pitcairn Island. The first, and by far the more extensively collected, was Adamstown, the only settlement on the island. The settlement occupies nearly one-fourth of the island and includes a number of different habitats from the rocky shores of Bounty Bay, the only harbor of the island, to garden plots and orchards near the homes. Where appropriate, Adamstown has been annotated with the specific habitat in the listing under the "Specimens Examined" section. The second site on Pitcairn was the beach at Down Rope. Down Rope is the only sandy beach of Pitcairn, is approximately 150 meters in length, and is only accessible from a steep trail down a cliff face on the southeast side of the island.

Because of their small size, essentially all of the main islet of both Oeno and Ducie were surveyed, although very hurriedly and superficially.

In accordance with the editorial policy of this publication series, new taxa are not described herein; these will be published elsewhere.

TREATMENT OF TAXA

SUBORDER NEMATOCERA

Family Sciaridae

1. *Bradysia* sp. (det. R.J. Gagné).

Specimens Examined.--Pitcairn Island. Adamstown (2♀).

Remarks.--The genus *Bradysia* comprises numerous species, and recognition of most are based on sexually dimorphic characters of males. Thus the two female specimens that we collected cannot be distinguished at the species level.

Family Psychodidae

2. *Psychoda* sp. (det. R.V. Peterson).

Specimens Examined.--Henderson. NW Beach (4♂, 7♀).

Remarks.--All specimens were collected in a Malaise trap during the night.

Family Culicidae

3. *Aedes* (*Stegomyia*) *aegypti* (Linnaeus, 1762:470; det. Y.M. Huang).

Specimens Examined.--Pitcairn Island. Adamstown (9♂, 1♀).

Distribution.--Pantropical, mostly within the 10° C. isotherms.

Remarks.--The literature on this species is voluminous, especially as it pertains to its vectoral capacity of numerous diseases of man. This species is the common man biter on Pitcairn, and its potential there as a vector of diseases should not be overlooked.

4. *Culex* (*Culex*) *quinquefasciatus* Say, 1823:10 (det. Y.M. Huang).

Specimens Examined.--Pitcairn Island. Adamstown (1♀).

Distribution.--Cosmopolitan.

Remarks.--This species, like the preceding one, is the vector of several diseases, mostly arboviruses, of man. Caution, therefore, should be exercised to avoid establishment of these diseases on Pitcairn.

Family Chironomidae

5. *Chironomus* s.l. sp. (det. P. Cranston).

Specimens Examined.--Henderson. North Beach (1♀).

Family Ceratopogonidae

6. *Dasyhelea pacifica* Macfie, 1933:99 (det. W.W. Wirth).

Specimens Examined.--Henderson. North Beach (9♂, 3♀).

Distribution.--Oceania: Common on Marquesas and Society Islands and the Pitcairn Group.

7. *Dasyhelea fulvicauda* Macfie, 1933:101 (det. W.W. Wirth).

Specimens Examined.--Henderson. North Beach (1♀).

Distribution.--Oceania: Common on Marquesas and Society Islands and the Pitcairn Group; Oriental: Taiwan.

8. *Dasyhelea* n. sp. (in *mutabilis* group)(det. W.W. Wirth).

Specimens Examined.--Henderson. North Beach (5♂, 5♀).

Distribution.--Oceania: The Pitcairn Group.

9. *Forcipomyia* (*Euprojoannisia*) *sauteri* Kieffer, 1912:27 (det. W.W. Wirth).

Specimens Examined.--Henderson. North Beach (6♂, 5♀).

Distribution.--Oceania: The Pitcairn Group; Oriental: Taiwan.

SUBORDER BRACHYCERA

Family Dolichopodidae

10. **Chrysosoma** n. sp. (det. D.J. Bickel).
 Specimens Examined.--Henderson. NW Beach (12♂, 11♀); North Beach (4♀).
 Distribution.--Oceania: Society Islands and the Pitcairn Group.
 Remarks.--Most of the specimens taken from the NW Beach were collected individually from the broad leaves of a shrub that was growing on top of the escarpment just above the beach.
11. **Chrysotus denticornis** Lamb, 1932:233 (det. D.J. Bickel).
 Specimens Examined.--Pitcairn Island. Adamstown (4♂, 5♀).
 Distribution.--Oceania: Society and Marquesas Islands and the Pitcairn Group.
12. **Cymatopus** n. sp. (det. D.J. Bickel).
 Specimens Examined.--Pitcairn Island. Adamstown (14♂, 6♀).
 Distribution.--Oceania: Cook Islands and the Pitcairn Group.

Family Phoridae

13. **Chonocephalus** sp. A. (det. H. Disney).
 Specimens Examined.--Henderson Island. NW Beach (5♂).
14. **Chonocephalus** sp. B. (det. H. Disney).
 Specimens Examined.--Henderson Island. NW Beach (4♂).
15. **Megaselia (Megaselia) scalaris** (Loew, 1866b:53; det. H. Disney).
 Specimens Examined.--Pitcairn Island. Adamstown (1?, abdomen missing).
 Distribution.--Pantropical.
 Remarks.--*Megaselia* has hundreds of species of which most are difficult to distinguish even when the male genitalia are intact. Hence the determination of this species must be considered tentative (Disney, in litt.).
16. **Dohrniphora cornuta** (Bigot, 1857:348; det. H. Disney).
 Specimens Examined.--Henderson Island. NW Beach (2♂).
 Distribution.--Pantropical.
 Remarks.--This species, which was originally described from Cuba, is common throughout the tropics.

Family Syrphidae

17. **Ischiodon scutellaris** (Fabricius, 1805:252; det. F.C. Thompson).
 Specimens Examined.--Henderson Island. NW Beach (5♂).
 Distribution.--Orient: SE Asia and Japan; Australasian: Australia; Oceania: Hawaii, Micronesia, and the Pitcairn Group.
 Remarks.--This species was attracted to flowers of *Pemphis acidula* Forst. that appeared to be in the last stages of flowering in May. *Pemphis acidula* is common on Henderson as a shrub or tree between the beach and cliff face.

Family Otitidae

18. **Perissoneura diversipennis** Malloch, 1932:207.
 Specimens Examined.--Henderson Island. NW Beach (60♂, 45♀); North Beach (6♂, 5♀). Oeno Atoll (7♂, 9♀).
 Distribution.--Oceania: Marquesas (Fatu Uku and Hatu Tu) and the Pitcairn Group.
 Remarks.--The wings of this species demonstrate considerable sexual dimorphism. Those of the male bear a pattern, whereas the female's are hyaline. This species is fairly abundant, especially on Henderson, and occurred mostly on low-lying vegetation in the shade. Adults were also attracted to human feces.
19. **Acrosticta apicalis** (Williston, 1896:375; det. G.C.Steyskal).--Malloch, 1932:206 (list, Marquesas).

Specimens Examined.--Pitcairn Island. Adamstown (1♀).

Distribution.--Widely distributed from the Neotropics, Africa, several islands of Oceania (Fiji, Samoa, Society Islands, Marquesas, Hawaii) and now the Pitcairn Group.

Remarks.--This species was collected while randomly sweeping vegetation.

20. *Euxesta stigmatias* Loew, 1868:310 (det. G.C. Steyskal).

Specimens Examined.--Pitcairn Island. Adamstown (1♂, 1♀).

Distribution.--Neotropics: Mexico and the West Indies, south to Brazil and Bolivia; Oceania: The Pitcairn Group.

Remarks.--This species was collected while randomly sweeping vegetation. Our collections on Pitcairn are the first records outside of the Neotropical Region.

Family Platystomatidae

21. *Scholastes lonchifera* Hendel, 1914:253.--Malloch, 1932:206 (list, Marquesas).

Specimens Examined.--Henderson Island. NW Beach (45♂, 40♀); North Beach (12♂, 7♀). Oeno Atoll (5♂, 5♀). Pitcairn Island. Adamstown (2♀).

Distribution.--Oceania: Society Islands (Tahiti), Cook Islands, Marquesas (Hiva Oa, Fatu Hiva, Ua Huka, Ua Pou), and the Pitcairn Group.

Remarks.--This species occurs commonly on shaded, low-lying vegetation, especially beneath coconut palms on Henderson and Oeno. The larvae of *Scholastes* breed in rotting vegetable matter, and at least one species, *S. bimaculatus* Hendel, breeds in rotting coconuts (Swezey, 1924:389-390). Adults are also attracted to human feces.

22. *Pseudorichardia flavitarsis* Macquart, 1850:121.--Malloch, 1932:206 (list, Marquesas).

Specimens Examined.--Henderson Island. NW Beach (1♂, 26♀); North Beach (1♂, 1♀). Oeno Atoll (2♂). Pitcairn Island. Adamstown (1♂, 1♀).

Distribution.--Oceania: Widespread from Fiji to the Society Islands (Tahiti), the Marquesas (Hiva Oa), and the Pitcairn Group.

Remarks.--This species is the type species of *Pseudorichardia*. Nearly all of the specimens from Henderson were taken from the sides of a tent or on vegetation near the site where birds were being prepared as museum specimens. Numerous bird skins and carcasses were usually hung or laid out to dry and apparently attracted this species.

Family Tephritidae

23. *Dacus setinervis* Malloch, 1938:112.

Specimens Examined.--Henderson Island. NW Beach (1♀). Pitcairn Island. Adamstown (2♂, 3♀).

Distribution.--This species is apparently endemic to the Pitcairn Group, where it is known from the type locality, Henderson Island, and now from Pitcairn.

Remarks.--Our previous knowledge of the Diptera of Henderson Island was limited to this and a species of Muscidae, both of which were thought to be endemic to this island. This species is now known from Pitcairn, where most specimens were collected on vegetation that had overgrown an old shed in Adamstown.

24. *Dioxyna sororcula* (Wiedemann, 1830:509; det. A.L. Norrbom).

Specimens Examined.--Pitcairn Island. Adamstown (3♂, 3♀).

Distribution.--Widespread in tropical and subtropical areas of the Old World and now the Pitcairn Group.

Remarks.--This species was originally described from specimens collected on the Canary Islands and has since been discovered to be widespread in tropical areas of the Old World. It was probably introduced to Pitcairn Island. This species lives in seeds of *Bidens*.

Family Lonchaeidae

25. *Lamprolonchaea metatarsata* (Kertész, 1901:83).

Specimens Examined.--Oeno Atoll (4♂, 4♀). Pitcairn Island. Adamstown (2♂, 4♀).

Distribution.--Widespread in Southeast Asia and Oceania.

Remarks.--This species was probably introduced to Oeno and Pitcairn, perhaps in infested fruit.

Family Lauxaniidae

26. **Homoneura hawaiiensis** (Grimshaw, 1902:84).--Hardy and Delfinado, 1980:134-135 (description and figures).
 Specimens Examined.--Henderson Island. NW Beach (27♀). Oeno Atoll (11♂, 10♀). Pitcairn Island. Adamstown (2♂, 13♀).
 Distribution.--Oceania: Marquesas, Society Islands, Samoa, Solomon Islands, Hawaii, and the Pitcairn Group.
 Remarks.--This species was fairly common and was swept from low-lying, shaded vegetation. On the NW Beach of Henderson, most specimens were collected by sweeping ferns.

Family Milichiidae

27. **Leptometopa beardsleyi** Hardy and Delfinado, 1980:358 (det. C.W. Sabrosky).
 Specimens Examined.--Henderson Island. NW Beach (2♀); North Beach (1♀). Oeno Atoll (5♂).
 Distribution.--Oceania: Hawaii and the Pitcairn Group.
 Remarks.--The specimen from North Beach was collected from guano-covered vegetation that was growing next to the nesting area of a masked booby (*Sula dactylatra* Lesson). In addition to the specimens noted above, a female from Oeno that is possibly a variety of *beardsleyi* was collected. Because intraspecific variation within *beardsleyi* has not been assessed and as the specimen in question is in poor condition, it is not specifically listed as this species.
28. **Desmometopa inaurata** Lamb, 1914:363 (det. C.W. Sabrosky).--Sabrosky, 1983:33 (revision).
 Specimens Examined.--Pitcairn Island. Adamstown (2♂, 2♀).
 Distribution.--Widespread throughout the world except for the Oriental Region. Oceania: Fiji, Samoa, Hawaii, Marquesas, and the Pitcairn Group.
 Remarks.--This species was probably introduced to Pitcairn Island.
29. **Milichiella lacteipennis** (Loew, 1866a:185; det. C.W. Sabrosky).
 Specimens Examined.--Pitcairn Island. Adamstown (3♀).
 Distribution.--Cosmopolitan.
 Remarks.--Like the previous species, this was probably introduced to Pitcairn Island.

Family Sphaeroceridae

30. **Coproica hirtula** (Rondani, 1880:38; det. A.L. Norrbom).
 Specimens Examined.--Pitcairn Island. Adamstown (11♂, 9♀).
 Distribution.--Cosmopolitan.
 Remarks.--This is undoubtedly an introduction to Pitcairn Island.

Family Xenasteiidae

31. **Xenasteia palauensis** Hardy, 1980:218.
 Specimens Examined.--Henderson Island. NW Beach (10♂, 14♀). Pitcairn Island. Adamstown (1♀).
 Distribution.--Oceania: Palau and the Pitcairn Group.
 Remarks.--This species was moderately common on low-lying vegetation that was growing immediately next to an open-air latrine, the contents of which apparently attracted it.

The identification of this species as *X. palauensis* must be considered tentative. When Hardy (1980:219-220) described this species he noted that several specimens other than the type series may represent this species or form a species complex of closely related species. The issue remains unresolved.

Family Chyromyidae

32. **Nannodastia horni** Hendel, 1930:70.--Sabrosky and Wirth, 1958:109-110.
 Specimens Examined.--Henderson Island. North Beach (4♂, 9♀); NW Beach (6♂, 3♀).
 Distribution.--Orient: Taiwan; Oceania: Hawaii and the Pitcairn Group.

Remarks.--Specimens of this species are tiny, usually less than 2 mm in length, and were collected in caves and under overhangs by sweeping a fine-meshed net just above the soil or debris on the floor. The caves and overhangs we sampled were 15-20 m above the beach on the cliff face.

Family Chloropidae

33. *Cadrema pallida* variety *bilineata* (Meijere, 1904:113; det. C.W. Sabrosky).
Specimens Examined.--Henderson Island. NW Beach (18♂, 70♀). Pitcairn. Adamstown (9♂, 15♀).

Distribution.--Widespread in the Orient and Oceania (extending to the Marquesas and south to the Pitcairn Group).

Remarks.--This species is moderately common on the beach at the high tide mark where debris had accumulated.

34. *Cadrema nigricornis* (Thomson, 1869:607; det. C.W. Sabrosky).

Specimens Examined.--Henderson Island. NW Beach (40♂, 46♀); North Beach (19♂, 8♀). Oeno Atoll (16♂, 1♀). Pitcairn Island. Adamstown (1♀).

Distribution.--Widespread in SE Asia and the Pacific islands to Hawaii, the Marquesas, and the Pitcairn Group.

Remarks.--Like the previous taxon, this species is also moderately common on the beach at the high tide mark where debris had accumulated.

35. *Cadrema samoensis* (Malloch, 1930:246; det. C.W. Sabrosky).

Specimens Examined.--Pitcairn Island. Adamstown (3♂).

Distribution.--Oceania: Samoa (Salailua and Safune) and the Pitcairn Group.

36. *Tricimba adamsoni* Malloch, 1933:29 (det. C.W. Sabrosky).

Specimens Examined.--Pitcairn Island. Adamstown (2♀).

Distribution.--Oceania: Marquesas and the Pitcairn Group.

37. *Gaurax bicoloripes* (Malloch, 1933:30; det. C.W. Sabrosky).

Specimens Examined.--Henderson Island. NW Beach (1♀). Oeno Atoll (1♂, 1♀). Pitcairn Island. Adamstown (10♂, 4♀).

Distribution.--Oceania: Marquesas and the Pitcairn Group.

38. *Gaurax* n. sp. (det. C.W. Sabrosky).

Specimens Examined.--Henderson Island. NW Beach (24♂, 4♀). Pitcairn Island. Adamstown (1♂, 1♀).

Distribution.--Oceania: The Pitcairn Group.

Family Tethinidae

39. *Dasyrhiconoessa lasiophthalma* (Malloch, 1933:17).--Sasakawa, 1974:2 (figure of male genitalia).

Specimens Examined.--Oeno Atoll (6♂, 6♀). Pitcairn Island. Adamstown (harbor area) (17♂, 6♀); Down Rope (20♂, 5♀).

Distribution.--Afrotropical: Seychelles; Oriental: China (Hong Kong), Philippines; Oceania: Marquesas south to the Pitcairn Group.

Remarks.--The habitat for this species is beaches where debris has accumulated at or above the high tide mark. On Oeno and Pitcairn, the species occurred commonly in this habitat.

Family Canacidae

40. *Nocticanace* n. sp.

Specimens Examined.--Oeno Atoll (30♂, 11♀). Pitcairn Island. Adamstown (harbor area) (33♂, 11♀); Down Rope (2♂, 5♀).

Distribution.--Oceania: The Pitcairn Group.

Remarks.--I found this species commonly on all beaches of Pitcairn and Oeno that had large rocks (rock diameter of 0.5 m or larger) or exposed coral.

Family Ephydriidae

41. **Placopsidella marquesana** (Malloch, 1933:13).--Tenorio, 1980:270-271, 350-351 (figures and description of larva and puparium).--Mathis, 1986:11-13 (revision).

Specimens Examined.--Pitcairn Island. Adamstown (harbor area) (11♂, 3♀); Down Rope (8♂, 9♀).

Distribution.--Oceania: Widespread in Oceania between the Solomon Islands and the Pitcairn Group and as far north as Hawaii.

Remarks.--This species was moderately abundant on the rocky beach of Bounty Bay, especially among larger rocks (0.5 m in diameter or larger) that offered some protection from the direct action of waves and the sun. Discovery of this species on Pitcairn is a major extension to its distribution; previously its farthest known locality southward was the Society Islands (Bora Bora and Tahiti)(Mathis, 1986).

42. **Hecamede granifera** Thomson, 1869:594.

Specimens Examined.--Henderson Island. NW Beach (88♂, 11♀); North Beach (56♂, 10♀). Oeno Atoll (34♂, 9♀). Pitcairn Island. Adamstown (7♂, 3♀); Down Rope (9♂, 6♀).

Distribution.--Oceania: The Marquesas (Nuku Hiva) and the Pitcairn Group.

Remarks.--The genus *Hecamede* needs revision before many of the available names can be validly applied. For the present, I am using *H. granifera* for this species in accordance with the recent catalog of Australasian and Oceanian Diptera (Mathis, 1989). A junior synonym, *H. inermis* Malloch, was used previously for the common species of *Hecamede* that occurs in the South Pacific.

This species was abundant on the beach, especially where debris had accumulated at the high tide mark. It was also common on specimens of corals and bird preparations that we had set out to dry.

43. **Atissa** sp.

Specimens Examined.--Pitcairn Island. Down Rope (1♂).

44. **Paratissa pollinosa** (Williston, 1896:414).

Specimens Examined.--Pitcairn Island. Adamstown (harbor area) (20♂, 7♀); Down Rope (7♂).

Distribution.--Neotropics: Dominica to St. Vincent and Panama; Oceania: Hawaii (Oahu and Maui) and the Pitcairn Group.

Remarks.--This species was collected on the rocky beach of Bounty Bay (Adamstown). Seaweed and other organic debris had accumulated at the specific site where the specimens were collected.

45. **Nostima striata** (Lamb, 1912:326; det. J. Edmiston).

Specimens Examined.--Oeno Atoll (11♂, 1♀).

Distribution.--Oceania: The Marquesas (Hiva Oa) and the Pitcairn Group.

Remarks.--Toward the northern end of Oeno are occasional patches of moss on the moist, mostly shaded soil beneath some of the larger trees. The patches of moss were no more than a meter or two in diameter, and the specimens seemed to be very specific to these patches.

Family Drosophilidae

46. **Drosophila (Sophophora) simulans** Sturtevant, 1919:153 (det. D.A. Grimaldi).

Specimens Examined.--Henderson Island. NW Beach (1♂, 1♀); North Beach (1♀). Pitcairn Island. Adamstown (1♂).

Distribution.--Cosmopolitan.

Remarks.--This species was probably introduced to Henderson and Pitcairn islands.

47. **Drosophila (Sophophora) melanogaster** species group (det. D.A. Grimaldi).

Specimens Examined.--Pitcairn Island. Adamstown (10♂, 14♀).

Distribution.--Cosmopolitan.

Remarks.--This species was undoubtedly introduced to Pitcairn Island.

48. **Phorticella** n. sp. (det. D.A. Grimaldi).
 Specimens Examined.--Pitcairn Island. Adamstown (5♂, 3♀).
 Distribution.--Oceania: The Pitcairn Group.
 Remarks.--The genus *Phorticella* Duda includes eight species (Wheeler, 1981), all of which have Oriental distributions. Thus this species would be the first from Oceania.

49. **Scaptomyza (Bunostoma) australis** Malloch, 1923b:618 (det. D.A. Grimaldi).
 Specimens Examined.--Henderson Island. NW Beach (1♂, 1♀).
 Distribution.--Australasian: Australia; Oceania: The Pitcairn Group.
 Remarks.--This is the first record of this genus in Polynesia except for numerous species on the Hawaiian Islands.

Family Agromyzidae

50. **Liriomyza** sp. (det. A. Freidberg).
 Specimens Examined.--Pitcairn Island. Adamstown (1♂, 1♀).
51. **Pseudonapomyza** sp. (det. A. Freidberg).
 Specimens Examined.--Pitcairn Island. Adamstown (1♀).

Family Muscidae

52. **Atherigona hendersoni** Malloch, 1923a:184 (det. A.C. Pont).
 Specimens Examined.--Henderson Island. NW Beach (40♀). Oeno Atoll (4♀). Pitcairn Island. Adamstown (17♀).
 Distribution.--Oceania: Fiji, Hawaiian Islands, Pitcairn Group, Tonga, Western Samoa.
 Remarks.--This is one of the more common species of Diptera to occur on these and other islands of the South Pacific.

Family Fanniidae

53. **Fannia pusio** (Wiedemann, 1830:437; det. A.C. Pont).
 Specimens Examined.--Henderson Island. NW Beach (1♂, 14♀). Oeno Atoll (9♂, 3♀). Pitcairn Island. Adamstown (1♂, 1♀).
 Distribution.--Oceania: Easter Islands, Fiji, Guam, Hawaiian Islands, Kiribati (Gilbert I), Pitcairn Group, Wake I, Western Samoa, New Caledonia, Afrotropical, Nearctic, Neotropical.
 Remarks.--Females were collected mostly by sweeping vegetation. An occasional specimen was captured in the Malaise trap. The single male from Henderson was part of a hovering swarm between three and four m above the ground.

Family Calliphoridae

54. **Phaenicia sericata** (Meigen, 1826:53; det. N.E. Woodley).
 Specimens Examined.--Henderson Island. NW Beach (11♂, 9♀). Oeno Atoll (4♀). Pitcairn Island. Adamstown (7♂, 3♀).
 Distribution.--Widespread throughout most of the Old World except for Africa and now the Pitcairn Group.
 Remarks.--Nearly all of the specimens we collected were taken from areas where dead animals were being prepared as museum specimens or for food.

55. **Cochliomyia macellaria** (Fabricius, 1775:776; det. N.E. Woodley).
 Specimens Examined.--Pitcairn Island. Adamstown (4♂, 8♀).
 Distribution.--Southern USA south to Argentina and Chile and the Pitcairn Group.
 Remarks.--This species was common around chicken coops and tables where dead fish were cleaned and prepared for cooking. It is almost surely an introduction and is known by the vernacular name of primary screw-worm.

56. **Hemipyrellia** sp. (det. N.E. Woodley).
 Specimens Examined.--Henderson Island. NW Beach (8♀).

Family Sarcophagidae

57. *Sarcophaga (Liosarcophaga) dux* (Thomson, 1869:534; det. T. Pape).

Specimens Examined.--Henderson Island. NW Beach (26♂, 9♀).

Distribution.--Oriental: India, Sri Lanka, Java, Philippines, China; Palearctic: S. Korea, Japan; Oceania: Guam, Hawaiian Islands, Mariana Islands, Henderson I, Samoa, Caroline Islands, Wake, Marshall Islands, Gilbert Islands; Australasian: Australia.

Remarks.--This species was attracted to bird preparations that we had laid out to dry. Females were especially common and many deposited first-instar larvae on the preparations.

Family Hippoboscidae

58. *Ornithoica pusilla* (Schiner, 1868:384; det. R.V. Peterson).--Maa, 1966:94-97 (revision).

Specimens Examined.--Henderson Island. NW Beach (2♀); North Beach (on a masked booby, *Sula dactylatra* Lesson) (10♂, 4♀).

Distribution.--Oceania: Christmas Island, Marshall Islands, Tokelau Island, Tuamotu Archipelago, Society Islands (Tahiti), and the Pitcairn Group.

Remarks.--We collected specimens of this species directly from a nesting pair of masked boobies.

59. *Olfersia aenescens* Thomson, 1869:610 (det. R.V. Peterson).

Specimens Examined.--Ducie Atoll (on a red-tailed tropicbird, *Phaethon rubricauda* Boddaert) (6♂). Henderson Island. NW Beach (1♂, 1♀); North Beach (2♂).

Distribution.--Nearly cosmopolitan over tropical seas as a parasite on various species of birds.

Remarks.--Most of the specimens that we collected on Henderson were taken as they would land on us. The specimens from Ducie Atoll were taken from a nesting red-tailed tropicbird. This is one of the few widespread species that probably occurs naturally on islands of the Pitcairn Group.

DISCUSSION

This study should only be considered within the limited perspective of two weeks of intensive field work and subsequent study of the resultant collections and observations. With more extensive collecting, including rearing of adults from immatures, more specialized collecting techniques (e.g. baits, Berlese funnels), and sampling at different seasons, the fauna of Diptera will undoubtedly be found to be more diverse. The same kind of sampling artifacts apply to attempts to determine the provenance of the fauna occurring on the Pitcairn Group.

Despite these qualifications, certain patterns are apparent from the available evidence. The evidence is summarized into tables (Tables 1-4) in which the islands of the Pitcairn Group are listed with the following abbreviations: DA = Ducie Atoll; HI = Henderson Island; OA = Oeno Atoll; PI = Pitcairn Island. For data in the tables that is cited under "Distribution Elsewhere," I have depended on the information provided by the specialist who identified the species and/or the forthcoming catalog of Diptera from the Australasian and Oceanian Regions (Evenhuis, 1989). Species determined simply as "sp." in the preceding section are not listed in the tables as we know nothing about their distribution.

The most apparent pattern is that the majority of Diptera from the Pitcairn Group probably dispersed there from other islands of Polynesia, and, moreover, that the Polynesian provenance reflects the overall pattern for Oceania in general, i.e., the Polynesian fauna of Diptera came mostly from the west, primarily from other islands but also from the Orient and Australia, including New Guinea. This is particularly evident from the data presented in Table 1. The species in this table, which constitute about two-thirds of the known fauna of the Pitcairn Group, are found elsewhere in Oceania, primarily Polynesia, or continental areas to the west. Most of these species either infiltrated from the west or they have sister groups occurring on islands or continents to the west.

The next largest category of Diptera are frequently referred to as "weeds" (Table 2). These species, numbering 11 on the Pitcairn Group, are pantropical or cosmopolitan, and for the most part, their occurrence reflects man's impact on these islands. The majority of these species occur only on Pitcairn Island, which is highly disturbed and where there is fairly regular commerce by which these flies could easily have been introduced.

Table 1. Distribution of Oceanian, Australian, and/or Oriental Diptera of the Pitcairn Group

	<u>DA</u>	<u>HI</u>	<u>OA</u>	<u>PI</u>	<u>Distribution Elsewhere</u>
<i>Dasyhelea pacifica</i>		X			Marquesas, Society
<i>Dasyhelea fulvicauda</i>		X			Marquesas, Society, Taiwan
<i>Forcipomyia sauteri</i>		X			Taiwan
<i>Chrysosoma</i> n. sp.		X			Society
<i>Chrysotus denticornis</i>				X	Marquesas, Society
<i>Cymatopus</i> n. sp.				X	Cook Islands
<i>Ischiodon scutellaris</i>		X			Oceania, widespread Asian
<i>Perissoneura diversipennis</i>		X			Marquesas
<i>Acrosticta apicalis</i>				X	Oceania, widespread tropics
<i>Scholastes lonchifera</i>		X	X	X	Widespread Oceanian
<i>Pseudorichardia flavitarsis</i>		X	X	X	Oceania east of Fiji
<i>Lamprolonchaea metatarsata</i>			X	X	Oceania, SE Asian
<i>Homoneura hawaiiensis</i>		X	X	X	Widespread Oceanian
<i>Leptometopa beardsleyi</i>		X	X		Hawaii
<i>Desmometopa inaurata</i>				X	Widespread Oceanian
<i>Xenasteia palauensis</i>		X		X	Oceanian
<i>Nannodastia horni</i>		X			Hawaii, Taiwan
<i>Cadrema pallida bilineata</i>		X		X	Oceanian, widespread Oriental
<i>Cadrema nigricornis</i>		X	X	X	Oceanian, SE Asian
<i>Cadrema samoensis</i>				X	Samoa
<i>Tricimba adamsoni</i>				X	Marquesas
<i>Gaurax bicoloripes</i>		X	X	X	Marquesas
<i>Dasyrhiconoessa lasiophthalma</i>			X	X	Oceanian, Seychelles, China
<i>Placopsidella marquesana</i>				X	Widespread Oceanian
<i>Hecamede granifera</i>		X	X	X	Marquesas
<i>Paratissa pollinosa</i>				X	Hawaii, Caribbean
<i>Nostima striata</i>				X	Marquesas
<i>Scaptomyza australis</i>		X			Australia
<i>Atherigona hendersoni</i>		X	X	X	Polynesian
<i>Fannia pusio</i>		X	X	X	Polynesian, New Caledonia
<i>Sarcophaga dux</i>		X			Oceanian, Oriental
<i>Ornithoica pusilla</i>		X			Widespread Oceanian

Endemism among Diptera from the Pitcairn Group is surprisingly low, with only five potential species (Table 3). Although these five are known thus far only from the Pitcairn Group, I would not be surprised to learn of their occurrence elsewhere. This potential is exemplified by the taxonomic history of *Atherigona hendersoni*. This species was originally described from specimens collected on Henderson Island (Malloch, 1923a) but has now been found as far west as Fiji and to the north as far as Hawaii (Adrian Pont, personal communication).

The neotropical otitid and calliphorid species (Table 4) that were unknown previously from Oceania are interpreted to be "baggage" that has accompanied man's arrival in recent times. The calliphorid is the primary screw worm of large mammals in the Western Hemisphere and could have arrived on Pitcairn Island with the various introductions of feral goats.

Table 2. Distribution of Cosmopolitan or Pantropical Diptera found on the Pitcairn Group

	<u>DA</u>	<u>HI</u>	<u>OA</u>	<u>PI</u>	<u>Distribution Elsewhere</u>
<i>Aedes aegypti</i>				X	Pantropical
<i>Dohrniphora cornuta</i>		X			Pantropical
<i>Olfersia aenescens</i>	X	X			Pantropical
<i>Dioxya sororcula</i>				X	Old World tropics
<i>Phaenicia sericata</i>		X	X	X	Widespread Old World
<i>Culex quinquefasciatus</i>				X	Cosmopolitan
<i>Megaselia scalaris</i>				X	Cosmopolitan
<i>Milichiella lacteipennis</i>				X	Cosmopolitan
<i>Coproica hirtula</i>				X	Cosmopolitan
<i>Drosophila simulans</i>		X		X	Cosmopolitan
<i>Drosophila melanogaster</i>				X	Cosmopolitan

Table 3. Distribution of Endemic Diptera of the Pitcairn Group

	<u>DA</u>	<u>HI</u>	<u>OA</u>	<u>PI</u>	<u>Distribution Elsewhere</u>
<i>Dasyhelea</i> n. sp.		X			Pitcairn Group
<i>Dacus setinervis</i>		X		X	Pitcairn Group
<i>Gaurax</i> n. sp.		X		X	Pitcairn Group
<i>Nocticanace</i> n. sp.			X	X	Pitcairn Group
<i>Phorticella</i> n. sp.				X	Pitcairn Group

Table 4. Distribution of Neotropical Diptera found on the Pitcairn Group

	<u>DA</u>	<u>HI</u>	<u>OA</u>	<u>PI</u>	<u>Distribution Elsewhere</u>
<i>Euxesta stigmatias</i>				X	Widespread neotropics
<i>Cochliomyia macellaria</i>				X	Widespread neotropics

CONCLUSIONS

This study of the Diptera from the Pitcairn Group reveals a much richer fauna than was reported previously. The results were largely expected, however, as insects are the dominant terrestrial group on most oceanic islands, especially those of the Pacific. The order Diptera, in turn, is one of the major components of the Insecta. Furthermore, these islands had not been visited previously by a specialist on Diptera, and the use of specialized knowledge and collecting techniques would normally result in additional finds.

Despite the substantial increase in the number of known species, from two to nearly 60, the dipterous fauna of the Pitcairn Group must still be considered depauperate and very disharmonic (lacking major lineages within the groups represented). These two conditions were likewise predictable. Nearly 30 years ago, Gressitt (1961) wrote that "...the fauna of southeastern Polynesia is a poor one, both in the sense of great disharmony and in general poverty of species." This study essentially corroborates Gressitt's observations.

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