

## Lectotype designations for Hawaiian Dolichopodidae (Insecta: Diptera)<sup>1</sup>

NEAL L. EVENHUIS 

Hawaii Biological Survey, Bishop Museum, 1525 Bernice Street, Honolulu, Hawai'i 96817-2704,  
USA; email: neale@bishopmuseum.org

**Abstract.** Studies on types of Hawaiian Dolichopodidae result in the designation herein of lectotypes for the following 11 taxa: *Asyndetus carcinophilus* Parent, 1937; *C. obscurus* Parent, 1938; *C. planitibia* Parent, 1940; *Cymatopus acrosticalis* Parent, 1937; *Euryngaster apicenigra* Parent, 1940; *E. maculata* Parent, 1940; *E. nigrohalterata* Parent, 1940; *E. retrociliata* Parent, 1940; *Hydrophorus williamsi* Parent, 1938; *Medetera atrata* Parent, 1940; and *Paraliancalus minor* Parent, 1938. A list of species with lectotype designations stemming from validating phraseology Hardy & Kohn (1964) are given to help clarify their status in upcoming works. Images are given for lectotypes in Bishop Museum newly designated here.

Type studies were undertaken for Hawaiian Dolichopodidae, supplementing the paper on lectotypes of *Campsicnemus* Haliday, 1851 by Evenhuis (2007), which has resulted in 11 further lectotype designations to fix the species definitions of taxa in a number of genera. The results are published here to allow more rigorous and detailed taxonomic studies of Hawaiian dolichopodids. In addition, to help with future taxonomic work on Hawaiian dolichopodids, a survey of Hardy & Kohn (1964) was conducted to ascertain all possible lectotype designations therein stemming from phraseology such as “the type”, which qualifies as a lectotype designation under I.C.Z.N. (1999) *Code Art.* 74.5.

### MATERIAL AND METHODS

Specimens derive from the Bishop Museum, Honolulu (BPBM). Some specimens found in the original Hawaiian Sugar Planters' Association (HSPA) collection in the Hawaii Department of Agriculture (HDOA) that were determined to be syntypic were transferred during this study to BPBM for permanent deposit. Other museums with Hawaiian dolichopodid type material researched and mentioned here include the Natural History Museum, London (BMNH), the Muséum National d'Histoire Naturelle in Paris (MNHN), and the University of Hawaii Insect Museum, Mānoa (UHIM). Format of presentation follows Radovsky *et al.* (1976). Arrangement of entries are alphabetical by species. Original and current generic combinations are given along with as complete as possible literature history of each name. The condition of each type specimen are given along with the numbers upon which the name was based and how many specimens were found in BPBM and other museums.

Label data for lectotypes designated in this study or for other primary types discussed here is given verbatim. Ends of lines on a label are indicated by the use of a solidus (/); beginning and ending of labels are indicated by use of double quotes (“ ”). Square brackets ([ ]) are used to indicate information added to label data and in other portions of this paper for clarification. All newly designated lectotypes designated here and in BPBM bear a blue or orange LECTOTYPE label.

1. Contribution No. 2022-007 to the Hawaii Biological Survey.

---

---

**BACKGROUND ON DETERMINATIONS OF TYPE STATUS BY HARDY**

As explained in Evenhuis (2007), there exists some confusion as to the type status of many Hawaiian Diptera treated by D.E. Hardy in the *Insects of Hawaii* series because of his use of a phrase such as “Type is in the British Museum (Natural History)” when in actuality the specimen(s) there were often not holotypes but syntypic, having other syntype specimens of the same species in other collections. The confusion stems from the specimens thought by Hardy to be “types” at the time of his visit to the BMNH (in the early 1950s) having a red ringed label with the word “Type”. A bit of the history leading to this mistaken identity by Hardy (and others) concerning the type status of material in the BMNH is repeated here from Evenhuis (2007).

As with many other museums across Europe, measures were taken at the BMNH in the early 1940s to protect its natural history collections from bombing raids. Collections were evacuated from the BMNH and transported into the country in two separate moves. The types were housed in one country house and the remainder of the collection scattered elsewhere. Since only one specimen per species would be taken to the type collection locality, an arbitrary decision was made with regard to syntype series as to which specimen would bear the characteristic red ringed BMNH “Type” label (the same as those used for holotypes) while the remainder were given yellow-ringed “paratype” labels. This decision on selection of an arbitrary “type” was left up to the various section curators. In the case of Diptera, that duty resided with F.W. Edwards (C.E. Dyte, pers. comm.), primarily a specialist on Nematocera and not necessarily experienced with families outside of his specialty. Thus, some of the specimens chosen to bear those labels may not have matched up well to the descriptions. When the collections were returned and combined once again after the war, the “type” and “paratype” labels of the syntypic specimens were not immediately removed (in fact in the Diptera collection, no concerted effort was made to remove the labels until the 1990s). Thus for over 50 years, syntype series without a designated lectotype were indistinguishable from type series that had a holotype specimen.

This finding of a single specimen labeled as “Type” is what Hardy (throughout his *Insects of Hawaii* volumes) and others recorded in their papers when researching types in the BMNH, not the fact that they were designating lectotypes. Hardy & Kohn (1964) also used the same phrase for dolichopodid specimens found in the HSPA Collection. This is no doubt because Parent normally only labeled one specimen of his series of specimens with the word “Type” although he never designated such as a holotype in any of his papers (C.E. Dyte, pers. comm.). Hardy & Kohn (1964) were then merely quoting the label data for the Parent specimens in HSPA, the same as they did with those in BMNH. However, because Hardy & Kohn (1964) most often used the phrase “Type in ...” and not “The type in ...” it is clear that Hardy was not designating lectotypes according to the *Code* and therefore these phraseologies in his papers should not be construed as lectotype designations. However, there are uses of “the type” in Hardy & Kohn (1964), which qualify as a lectotype designation according to ICZN *Code* Art. 74.5. To help clarify what is and what is not a lectotype among phraseologies used by Hardy & Kohn (1964), a survey was conducted of all such uses for dolichopodid species in that work and are summarized at the end of this paper.



**Figure 1.** Octave Parent (1882–1942).

### **HAWAIIAN DOLICHOPODIDAE COLLECTIONS AND OCTAVE PARENT**

Since a number of specimens treated here were authored by Parent, I thought it would be helpful to explain the reason for syntypic specimens authored by him to be in a number of collections.

Much of the dolichopodid material treated here was collected primarily by entomologist Francis Xavier Williams, who was a prolific worker in Hawai‘i from 1916–1948 (with many travels to various Pacific locales during those years) and who made extensive biological observations, rearings, and excellent illustrations of many insects including being one of the few to do biological studies on Hawaiian Dolichopodidae. The material collected by Williams in the 1930s was deposited in the collections of the Hawaii Sugar Planters’ Association (HSPA), at the time the primary entomological research institution in Hawai‘i. After the taxonomic research aspects of the HSPA declined, the HSPA Collection, which contained a great deal of type material described by many entomologists throughout the decades, was transferred in the 1960s to the Hawaii State Department of Agriculture (HDOA) in Honolulu. In 1964, a donation of 150,000 insect specimens from HSPA (Radovsky *et al.* 1976) was given to the BPBM including most but not all of the type material in that collec-

tion. In 1975, BPBM staff went to HDOA to recover an additional set of type specimens deriving from the HSPA Collection. At that time HDOA transferred all the material that were found with “type” labels to the BPBM for permanent deposit, retaining the remainder of the original HSPA Collection as a synoptic reference collection. There are apparently still some syntypic specimens in HDOA (especially those not with “type” labels but matching type localities and dates). Some of those HSPA specimens in HDOA (primarily Dolichopodidae) have been identified during this study as belonging to original type series and have been transferred to BPBM.

The Abbé Octave Parent (1882–1942) (Fig. 1) published five papers describing new species of Hawaiian Dolichopodidae (1934, 1937a, 1937b, 1938, 1940). Material for the last three of these papers were based on specimens sent by F.X. Williams (on behalf of the Hawaiian Entomological Society or the HSPA) directly to Parent, or to the International Institute of Entomology (IIE; the forerunner of today’s CABI), who sent material on to Parent as the primary expert in Europe on Dolichopodidae in those days. After identification, identified specimens (thus syntypes for the new species) were returned to Hawai‘i, but other specimens were kept by Parent, or IIE, or both.

Much of the Hawaiian material Parent used for descriptions of new species derived from HSPA collections, the Hawaiian Entomological Society collections (which were housed at HSPA), or directly from F.X. Williams. The types of all of the species described in Parent’s 1937b paper were returned to the collection of the Hawaiian Entomological Society (then at the same location as the HSPA on Makiki Street in Honolulu), which were subsequently transferred with the HSPA specimens labelled as “types” (in 1964 or 1975) to BPBM for permanent deposit. Much of this returned material has a label (now aged brown over time) with “Type” handwritten by Parent. Other of this material was exchanged with or given (by Parent) to the Imperial Institute of Entomology (IIE) in London, which subsequently transferred this material to BMNH in three accessions (one in 1936; two in 1938) (C.E. Dyte, pers. comm.). Subsequent visits to the HDOA collection by me over the years has resulted in the finding of syntypic material not found previously. This material has been transferred to the BPBM with vouchers of non-primary types (= material other than lectotypes) returned to HDOA.

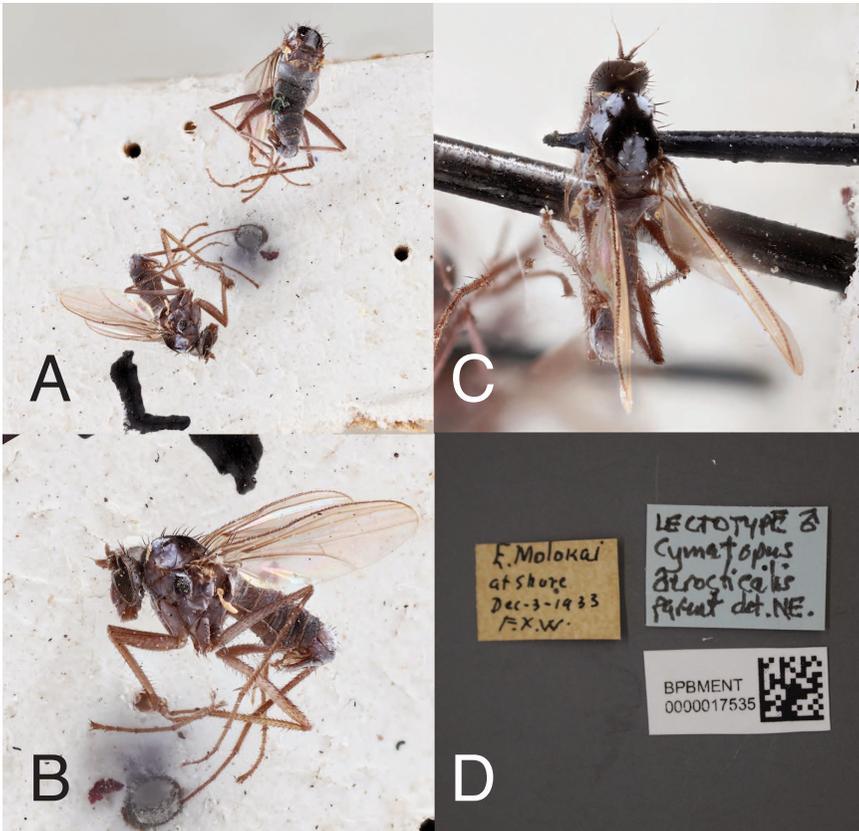
## TYPE STUDIES

**acrosticalis**  
(Fig. 2)

**Lectotype** ♂

BPBMNT 0000017535  
pin

- Paraphrosylus* sp.: Bryan, 1926: 68; Polhemus, 1991: 2, 4.  
*Cymatopus acrosticalis* Parent, 1937a: 144. *Nomen nudum*.  
*Cymatopus acrosticalis* Parent, 1937b: 69. Williams, 1940: 314; McKay, 1945: 206; Hardy, 1952: 454; Smith, 1952: 430; Dyte, 1959: 140; Oldroyd, 1964: 145; Sunose & Satō, 1994: 655.  
*Paraphrosylus acrosticalis* (Parent): Hardy & Kohn, 1964: 251. Beardsley, 1966: 165; Asquith & Messing, 1993b: 5.  
*Aphrosylus* (*Paraphrosylus*) *acrosticalis* (Parent): Caspers, 1966: 8.  
*Conchopus acrosticalis* (Parent): Takagi, 1965: 52; Tenorio, 1969: 64; Masunaga *et al.*, 2005: 439; Masunaga & Saigusa, 2010: 4; Grichanov, 2014: 131, 2017: 151; Abdelsalam, 2019: 90.  
*Cymatopus acrostichalis*: incorrect subsequent spelling of *acrosticalis* (Negrobov, 1977: 354).  
*Thambemyia acrosticalis* (Parent): Meuffels & Grootaert, 1984: 152; Bickel & Dyte, 1989: 406; Nishida, 1992: 98, 1994: 92, 1997: 78, 2002: 95; Grootaert & Evenhuis, 1997: 74; Englund, 2001: 8; Englund *et al.*, 2000a: 65; Howarth & Preston, 2002: 55; Englund & Arakaki, 2003: 5; Yang *et al.*, 2006: 255.  
*Thambemyia acrostichalis*: incorrect subsequent spelling of *acrosticalis* (Evenhuis & Eldredge, 2004: 212; Englund *et al.* 2007: 230).



**Figure 2.** Lectotype male of *Cymatopus acrosticalis* Parent. **A.** Position of type specimens on cork stage (lectotype indicated by an “L”). **B.** Lateral view. **C.** Dorsal view. **D.** Labels.

**Published type locality:** HAWAIIAN ISLANDS: **Moloka‘i:** at shore rocks, 3 Dec 1933, F.X. Williams.

**Label data:** “E. Molokai / at shore / Dec-3-1933 / F.X.W. [in Williams’s handwriting]”, “LECTOTYPE ♂ / *Cymatopus* / *acrosticalis* / Parent det. N.E. [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Conchopus acrosticalis* (Parent) [*teste* Masunaga & Saigusa (2010)].

**Condition:** The lectotype is mounted with another male on a thick square cork stage, each pinned with a minuten. The lectotype is in good condition with only the eyes collapsed from air drying. Slight verdigris starting to appear at the tip of the minuten. There are additional holes on the cork stage indicating that there might have been other specimens once mounted on the stage that are no longer here.



**Figure 3.** Lectotype male of *Eurynogaster apicenigra* Parent. **A.** Lateral view. **B.** Dorsal view. **C.** Labels.

**Remarks:** The species was originally described based on an undetermined number of males and females from Moloka‘i taken at rocks along the seashore by F.X. Williams on 3 December 1933. Three male and one female syntype (now paralectotypes) are in BMNH [under the name “*Tambemyia acrostichalis* (Parent)”]. Seven male and one female syntypes mounted on cork stages on three pins matching the above locality data were located in the former HSPA collections at HDOA (since transferred to BPBM). The best preserved of these now in BPBM, a male on the same cork stage with another male, is here designated **lectotype male** and indicated on the cork stage with an inked “L”. Parent (1937a) listed this name as *Cymatopus acrosticalis* Par.” among species he treated in that paper, referring to an undetermined number of specimens collected by F.X. Williams at Hanauma Bay, O‘ahu, in “muddy shallows” in May 1936. There are no characters given to differentiate the species in that work, so it is a *nomen nudum* there. No doubt, Parent had received the Hanauma Bay material subsequent to submitting his *Konowia* paper (Parent, 1937b), but the *Konowia* work came out a few months later than this one (Parent 1937a).

**apicenigra**  
(Fig. 3)

**Lectotype** ♂

BPBMENT 0000081260  
pin

*Eurynogaster apicenigra* Parent, 1940: 240. Hardy, 1952: 454; Hardy & Kohn, 1964: 179; Tenorio, 1969: 41; Bickel & Dyte, 1989: 413; Nishida, 1992: 96, 1994: 90, 1997: 76, 2002: 94; Yang *et al.*, 2006: 451

*Adachia apicenigra* (Parent): Evenhuis, 2005: 45; Yang *et al.*, 2006: 451; Grichanov, 2014: 26, 2017: 38; Chursina *et al.*, 2016: 507; Goodman *et al.*, 2016: 3.

**Published type localities:** HAWAIIAN ISLANDS: (1) O‘ahu: [Wai‘anae Mountains], Mt Ka‘ala, 3,000 ft; (2) O‘ahu: [Ko‘olau Mountains], Punalu‘u uplands, dripping bank.





**Figure 5.** Lectotype male of *Asyndetus carcinophilus* Parent. **A.** Lateral view. **B.** Dorsal view. **C.** Labels.

**Current status:** Junior synonym of *Medetera grisescens* Meijere, 1916 [*teste* Yang *et al.* (2006)].

**Condition:** Very good; eyes and abdomen collapsed from air drying.

**Remarks:** Described from one male and two females without designating a holotype. The male specimen in BPBM labeled as holotype is here designated **lectotype male**. Synonymized with *M. grisescens* Meijere by Bickel (1987: 246).

**carcinophilus**  
(Fig. 5)

**Lectotype** ♂

BPMBENT 0000016649  
pin

*Asyndetus carcinophilus* Parent, 1937a: 132. Williams, 1938: 126; Parent, 1940: 248; Hardy, 1952: 453; Smith, 1952: 430; Brown, 1956: 235; Dyte, 1959: 140; Hardy & Kohn, 1964: 238; Oldroyd, 1964: 145; Bickel & Dyte, 1989: 407; Nishida, 1992: 93, 1994: 88, 1997: 74, 2002: 91; Bickel, 1996: 1152; Bickel & Sinclair, 1997: 251; Howarth & Preston, 2002: 55; Yang *et al.*, 2006: 40; Grichanov, 2014: 58, 2017: 70; Souza, 2017: 88.

**Published type locality:** “I. Sandwich” [HAWAIIAN ISLANDS]; **O•AHU:** beach near “blowhole”, 22 May 1936, usually at mouth of crab holes, [F.X. Williams].

**Label data:** “Beach nr “blow hole” / OAHU. V-22-36 / F.X.W usually in mouth of crab holes [in Williams’s handwriting]”, “LECTOTYPE ♂ / *Asyndetus* / *carcinophilus* / Parent / det. n. Evenhuis [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Asyndetus carcinophilus* Parent, 1937 [*teste* Yang *et al.* (2006)].

**Condition:** Good; left hind leg beyond trochanter broken off and missing.

**Remarks:** Described from an undetermined number of males and females from the above published type locality. Hardy & Kohn (1964: 238) indicated two specimens they had located in the MNHN with the correct type locality data but stated that neither

was labeled as a type. Thirteen syntypes (now paralectotypes) are deposited in BMNH but were not mentioned by Hardy & Kohn (1964). Nine males and females in the HDOA collections (originally in HSPA; now transferred to BPBM) under the label data above were located, two of which (a male and female pinned with minuten to a cork stage) are labeled as “cotypes” in Parent’s handwriting. The male on the pin is here designated **lectotype male**.

**cilifemorata****Paralectotype ♀**

pin

*Eurynogaster cilifemorata* Parent, 1940: 241. Hardy, 1952: 455; Hardy & Kohn, 1964: 185  
Tenorio, 1969: 41, 66; Bickel & Dyte, 1989: 413; Nishida, 1992: 97, 1994: 91, 1997: 76,  
2002: 94; Yang *et al.*, 2006: 476; Grichanov, 2014: 227, 2017: 250; Goodman *et al.*, 2016:  
3.

**Published type locality:** HAWAIIAN ISLANDS: (1) O’ahu: Olympus trail, 2,400 ft, Oct [1936], foliage, F.X. Williams. (2) O’ahu: Kōnāhuanui, 2700 ft., November (3) O’ahu: Lulumahu Stream, 1900 ft, September, “slopes of valley”.

**Label data:** “Mt. Olympus / OAHU. 2400 ft / Aug - 16 - 36 / F.X.W. / Foliage [in Williams’s handwriting]”, “PARALECTOTYPE ♀ / *Eurynogaster* / *cilifemorata* Par. / det. N. Evenhuis [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Eurynogaster cilifemorata* Parent, 1940 [*teste* Yang *et al.* (2006)].

**Condition:** Good.

**Remarks:** Parent (1940: 241) based this species on an unspecified number of males and females from three localities in the southern portion of the Koo‘lau range on O’ahu, all near Honolulu. Hardy & Kohn (1964: 186) mentioned a male in the Parent collection in MNHN as being “the type”, thus qualifies as a lectotype designation. Additionally, 11 syntypes (now paralectotypes) are in BMNH; two females were found in this study in the old HSPA collection in HDOA and transferred to BPBM. These paralectotypes are mounted with a minuten pin on a cork stage.

**maculata****Lectotype ♂**

BPBM 2008035010

(Fig. 6)

pin

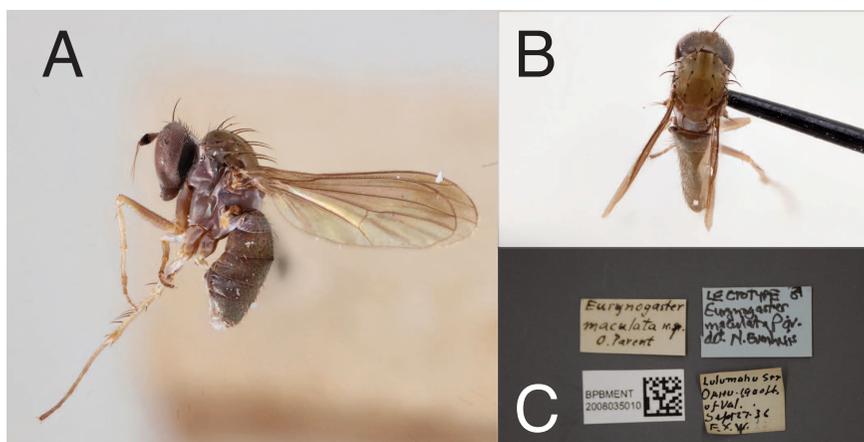
*Eurynogaster maculata* Parent, 1940: 242; Hardy, 1952: 455; Hardy & Kohn, 1964: 206; Tenorio, 1969: 41; Bickel & Dyte, 1989: 413; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94; Yang *et al.*, 2006: 475; Grichanov, 2014: 267, 2017: 251; Goodman *et al.*, 2016: 3.

**Published type localities:** HAWAIIAN ISLANDS: (1) O’ahu: Mt. Ka’ala “near spring”, 3,600 ft., Sep.; (2) Ko’olau Summit Trail, 2,800 ft., Nov.; (3) Kōnāhuanui, 2750 ft., Nov.; (4) Lulumahu Stream, 1900 ft.”.

**Label data:** “Lulumahu Str / OAHU. 1900 ft / of Val. / Sept. 27 - 36 / F.X.W. [in Williams’s handwriting]”, “*Eurynogaster* / *maculata* / O. Parent” [in Parent’s handwriting]”, “LECTOTYPE ♂ / *Eurynogaster* / *maculata* Par. / det. N. Evenhuis [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Eurynogaster maculata* Parent, 1940 [*teste* Yang *et al.* (2006)].

**Condition:** Fair; missing both hind legs and left mid leg beyond the coxa.



**Figure 6.** Lectotype male of *Euryzogaster maculata* Parent. **A.** Lateral view. **B.** Dorsal view. **C.** Labels.

**Remarks:** The type series consisted of an unspecified number of males and females from a number of high elevation localities in the Wai‘anae and Ko‘olau ranges. Six syntypes were located in the BMNH. Four additional syntypes were located in the BPBM; the best preserved specimen in the BPBM from Lulumahu Valley in the Ko‘olau mountains is here designated **lectotype male**. The lectotype is mounted with a minuten to a coated cork stage. There is an additional hole in the stage indicating there might have been another specimen mounted on the same stage at one time.

**minor**  
(Fig. 7)

**Lectotype ♀**

BPBM 000002065  
pin

*Paraliancalus minor* Parent, 1938: 213. Parent, 1940: 243, 249.

*Euryzogaster minor* (Parent). Parent, 1940: 243, 249; Williams, 1940: 296, 298, 299, 301, 302, 304, 306; Hardy, 1952: 455; Smith, 1952: 430; Hardy & Kohn, 1964: 206; Tenorio, 1969: 41; Bickel & Dyte, 1989: 413; Nishida, 1992: 95, 1994: 89, 1997: 75, 2002: 92; Polhemus, 1996: 76, 79; Englund *et al.*, 1998: 26, 2000b: 102, 104; Englund, 2000b: 5; Englund & Polhemus, 2001: 270.

*Major minor* (Parent): Evenhuis, 2005: 53; Yang *et al.*, 2006: 480; Englund *et al.*, 2007: 229; Grichanov, 2014: 302, 2017: 328; Goodman *et al.*, 2016: 3.

**Published type locality:** HAWAIIAN ISLANDS: **O‘ahu:** Kukuiala Valley, Waianua Stream, 16 Sep 1933, “wet bank”, F.X. Williams.

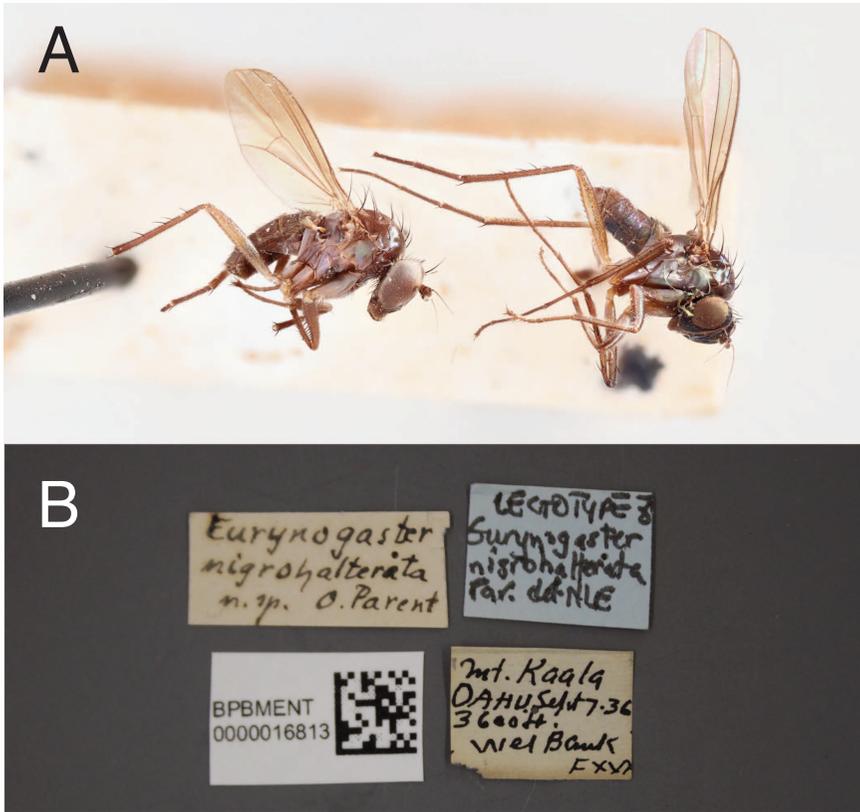
**Label data:** “Kukuiala Val. / Waianae Mts / OAHU. Sept 16 - 33 / wet bank / F.X.W. [in Williams’s handwriting]”, “Paraliancalus / minor. n. sp. / Type / O. Parent [unknown hand]”, “LECTOTYPE ♀ / Paraliancalus minor / Parent / det. N. Evenhuis [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Major minor* (Parent, 1938) [*teste* Yang *et al.* (2006)].

**Condition:** Good; missing left mid leg beyond the coxa; eyes collapsed from air drying.

**Remarks:** Transferred to *Major* by Evenhuis (2005: 53). The treatment in Parent (1940:





**Figure 8.** Lectotype male of *Eurynogaster nigrohalterata* Parent. **A.** Lateral view (lectotype on right). **B.** Labels.

**Remarks:** Parent (1940) based *Eurynogaster nigrohalterata* on an unspecified number of males and females deposited in the Hawaiian Entomological Collection. Seven syntypes (now paralectotypes) were located in the BMNH. Three males and two females were located in this study in the old HSPA collection at HDOA and transferred to BPBM. The best preserved of these now in BPBM is here designated **lectotype male**. It is on the same cork stage as a female and is the outermost (away from the pin) of the two and marked as such. The stage has been glued to the pin to keep it from spinning.

**obscurifacies**

**Lectotype ♂**

BPMENT 0000004076  
pin

*Eurynogaster obscurifacies* Parent, 1940: 244. Hardy, 1952: 455. Hardy & Kohn, 1964: 212; Tenorio, 1969: 41; Bickel & Dyte, 1989: 413; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94.

*Adachia obscurifacies* (Parent): Evenhuis, 2005: 45; Yang *et al.*, 2006: 451; Grichanov, 2014: 26, 2017: 38.



**Figure 9.** Lectotype male of *Campsincnemus obscurus* Parent. **A.** Dorsal view of type specimens on cork stage (lectotype indicated by arrow). **B.** Lateral view. **C.** Labels.

**Published type locality:** HAWAIIAN ISLANDS: **O‘ahu:** Mt. Ka‘ala, 3,600 ft, [1936], wet bank, [F.X. Williams]

**Label data:** “Mt. Kaala / OAHU. Sept. / 13 – 1936 / spring 3600 ft / FW [in Williams’s handwriting]”, “Euryrogaster / obscurifacies / n. sp. O. Parent [in Parent’s handwriting]”, “Type [handwritten]” [square red label], “LECTOTYPE ♂ / Euryrogaster / obscurifacies / Parent / det. H & K. 1964 [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Adachia obscurifacies* (Parent, 1940) [*teste* Yang *et al.* (2006)].

**Condition:** Fair; both wings shriveled possibly from air drying from liquid preservation; arista on right antenna broken off and missing; right hind leg beyond femur broken off and missing; tip of abdomen missing (dissected?).

**Remarks:** Parent (1940) based this species on an unspecified number of males and females. Two syntypes (now paralectotypes) were located in the BMNH, but the asterisk (\*) in Parent’s (1940) paper indicates that the types are in the collection of the Hawaiian Entomological Society (in HSPA at the time). Two specimens (a male and a female) on one cork stage were in the old HSPA collection in HDOA and transferred to BPBM before this study. The male is the lectotype designated by Hardy & Kohn (1964; see list below for discussion).

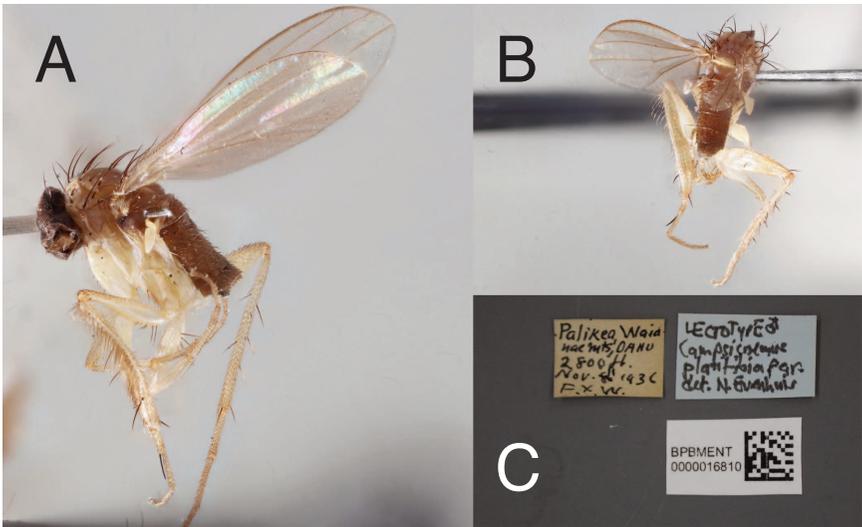
**obscurus**  
(Fig. 9)

**Lectotype** ♂

BPMBENT 0000004062  
pin

*Campsincnemus obscurus* Parent, 1937b: 78. Parent, 1940: 236; Williams, 1940: 296; Hardy, 1952: 454; Hardy & Kohn, 1964: 129; Tenorio, 1969: 4, 66; Bickel & Dyte, 1989: 411; Nishida, 1992: 95, 1994: 89, 1997: 75, 2002: 93; Yang *et al.*, 2006: 464; Evenhuis, 2007: 30; Grichanov, 2014: 76, 2017: 89.

**Published type localities:** (1) HAWAIIAN ISLANDS: **Moloka‘i:** Moalua [= Moa‘ula] Stream, 2100 ft, 29 Feb 1933, on water, F.X. Williams; (2) HAWAIIAN ISLANDS:



**Figure 10.** Lectotype male of *Campsicnemus plantitibia* Parent. **A.** Lateral view. **B.** Dorsal view. **C.** Labels.

**Moloka'i:** East Moloka'i Mountains, 2,400 ft, 28 Nov 1933, F.X. Williams.

**Label data:** “Molokai / Moalua Str / 2100 ft. on / water. / II - 29 - 33 // FXW [in Williams’s handwriting]”, “*Campsicnemus obscurus* n. sp. / O. Parent [in Parent’s handwriting]”, “LECTOTYPE ♂ / *Campsicnemus obscurus* Parent / det. N. Evenhuis [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Campsicnemus obscurus* Parent, 1938 [*teste* Yang *et al.* (2006)].

**Condition:** Good; slightly dusted with microscopic debris; most of the mesoscutal setae were broken off when pinned with the minuten.

**Remarks:** Originally based on an unspecified number of male and female specimens from “Moalua” Stream [= Moa’ula], 2,100 feet elevation, collected by F.X. Williams on 29 February 1933 and from E. Moloka’i Mountains, 2,400 feet, collected by F.X. Williams on 28 November 1933. Nine specimens of the type series were located in BMNH; four specimens from Kōnāhuanui Trail were originally deposited in MNHN (two per cork stage), three still survive (two males and one female, only the minuten pin remains of the fourth specimen); one female was found in BPBM (incorrectly labeled as a holotype<sup>2</sup>); and two specimens, a male and a female on the same pin, were found in the old HSPA collection in HDOA (since transferred to BPBM). Hardy & Kohn (1964: 130) stated “Three cotypes (two males, one female) in the Parent Collection at the Museum National d’Histoire Naturelle, Paris; the type is evidently one of these male specimens but it has not been designated. Allotype female and two male cotypes in HSPA”. Evenhuis (2007) abstained from designating a lectotype

<sup>2</sup> This was a specimen originally in the HSPA collection but transferred in 1961 to the BPBM when all specimens with “type” labels in the old HSPA collection were transferred to BPBM. The remaining two specimens in the type series of this species (in HDOA) were inadvertently not transferred because they lacked type labels. Research in this study confirmed that they were indeed a part of the original syntype series.

pending further research. The specimens in the type series have been thoroughly examined in this study and a **lectotype male** in the BPBM is here designated. The lectotype is the innermost (toward the pin) of two males pinned with minutenens on the same cork stage. The lectotype is indicated with an inked “L” and an arrow.

**planitibia** (Fig. 10) **Lectotype** ♂ BPBM 0000016810  
pin

*Campsicnemus planitibia* Parent, 1940: 232. Hardy, 1952: 454; Hardy & Kohn, 1964: 135; Tenorio, 1969: 4. Bickel & Dyte, 1989: 411; Nishida, 1992: 96, 1994: 90, 1997: 76, 2002: 93; Yang *et al.*, 2006: 465; Evenhuis, 2007: 32; Goodman *et al.* 2014: 236; Grichanov, 2014: 77, 2017: 90.

**Published type localities:** (1) HAWAIIAN ISLANDS: **O‘ahu:** Mt. Ka‘ala, trail, 1,800 ft, Aug 1936, [F.X. Williams]; (2) HAWAIIAN ISLANDS: **O‘ahu:** Wai‘anae Mountains, Palikea, 2,800 ft, Nov [1936, F.X. Williams].

**Label data:** “Palikea Waia- / nae Mts, OAHU / 2800 ft / Nov. 8–11 1936/ FXW” [in Williams’s handwriting], “LECTOTYPE ♂ / Campsicnemus / planitibia Par. / det. N. Evenhuis” [in Evenhuis’s handwriting] [light blue label].

**Current status:** *Campsicnemus planitibia* Parent, 1940 [teste Evenhuis (2007)].

**Condition:** Good; occiput and posterior of eyes collapsed due to air drying.

**Remarks:** Parent (1940) based *Campsicnemus planitibia* on an unspecified number of males and females from the above localities. Since the time that Evenhuis (2007) indicated that 28 syntypes had been located in BMNH, MNHN, and HDOA, three additional male syntypes were located among specimens of the old HSPA collection in HDOA and have been transferred to BPBM. A **lectotype male** is here designated from the best preserved of these. It is pinned with a minuten to a coated cork stage.

**retrociliata** (Fig. 11) **Lectotype** ♂ BPBM 0000004077  
pin

*Eurynogaster retrociliata* Parent, 1940: 244. Hardy, 1952: 455; Hardy & Kohn, 1964: 217; Tenorio, 1969: 41; Bickel & Dyte, 1989: 414; Nishida, 1992: 97, 1994: 91, 1997: 77, 2002: 94; Evenhuis, 2005: 51; Yang *et al.*, 2006: 476; Grichanov, 2014: 228, 2017: 251.

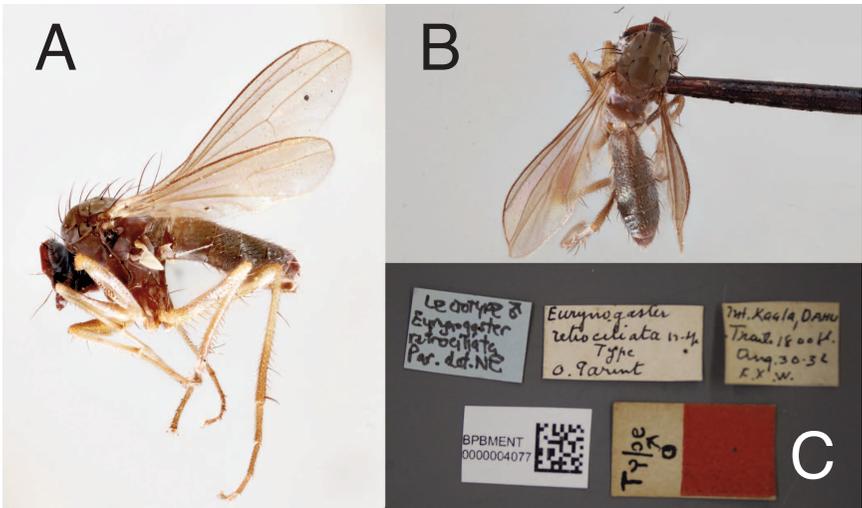
**Published type locality:** (1) HAWAIIAN ISLANDS: **O‘ahu:** Tantalus Crater, 1,800 ft, Aug [1936, F.X. Williams]; (2) HAWAIIAN ISLANDS: **O‘ahu:** Mt. Ka‘ala Trail, 1,800 ft, Aug [1936, F.X. Williams].

**Label data:** “Mt. Kaala, OAHU / Trail 1800 ft. / Aug 30 – 36 / F.X.W. [in Williams’s handwriting]”, “Eurynogaster / retrociliata n. sp. / Type / O. Parent” [in Parent’s handwriting]”, “Type ♂” [label with bottom half red], “LECTOTYPE ♂ / Eurynogaster / retrociliata / Par. det. NLE [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Eurynogaster retrociliata* Parent, 1940 [teste Evenhuis (2005)].

**Condition:** Good; left midleg broken off beyond femur and missing; eyes collapsed from air drying.

**Remarks:** Parent (1940) based this species on an unspecified number of specimens from the two localities listed above. Eleven syntypes (now paralectotypes) were located in the BMNH, but the asterisk (\*) in Parent’s (1940) paper indicates that the types are in the collection of the Hawaiian Entomological Society (at the time in HSPA). Four such



**Figure 11.** Lectotype male of *Eurynogaster retrociliata* Parent. **A.** Lateral view. **B.** Dorsal view. **C.** Labels.

syntypes (one female from the Mt. Ka‘ala locality; one male and two females from the Tantalus locality) were located and transferred from the old HSPA collection in HDOA to BPBM. Of the two male and two female syntypic specimens now in BPBM, the best preserved of these is here designated as **lectotype male**. The lectotype is pinned with a minuten on the same coated cork stage as one of the paralectotype females.

**ridiculus**

**Lectotype ♂**

BPBM 0000004066  
pin

*Campsicnemus ridiculus* Parent, 1937b: 81. Parent, 1940: 237; Hardy, 1952: 454; Brown, 1956: 464; Hardy & Kohn, 1964: 149; Tenorio, 1969: 4; Bickel & Dyte, 1989: 412; Nishida, 1992: 96, 1994: 90, 1997: 76, 2002: 93; Polhemus, 1992: 2, 5, 1993: 4, 1994: 2, 1996: 37, 38, 39, 41, 42, 45, 49, 50, 53; Englund, 2000: [2], 2001: 8; Englund & Arakaki, 2003: 5; Mitchell *et al.*, 2005: 6-36; Yang *et al.*, 2006: 466; Englund *et al.*, 2007: 229; Grichanov, 2014: 78, 2017: 91; Moody *et al.*, 2017: 147; Evenhuis, 2016: 34.

**Published type locality:** HAWAIIAN ISLANDS: **Moloka‘i:** near “Molaua” [sic], 2400 ft., 29 November 1933, F.X. Williams.

**Label data:** “Molokai / near Moalua / 2400 ft ± / Nov. 29 – ’33 / F.X.W. [in Williams’s handwriting]”, “*Campsicnemus / ridiculus / Type / O. Parent* [in Parent’s handwriting]”, “LECTOTYPE / *Campsicnemus / ridiculus* Par. / det. H & K. 1964 [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Campsicnemus ridiculus* Parent, 1937 [teste Evenhuis (2016)].

**Condition:** Fair; the following legs are broken off and missing: left fore leg including coxa, right fore leg beyond coxa, right mid leg beyond coxa

**Remarks:** A lectotype male was designated by Hardy & Kohn (1964: 149; see list below). The lectotype was originally in the old HSPA collected at HDOA and was transferred to BPBM, where it is now lodged. The lectotype is pinned with a minuten to a coated cork stage. The specimen appears greasy.

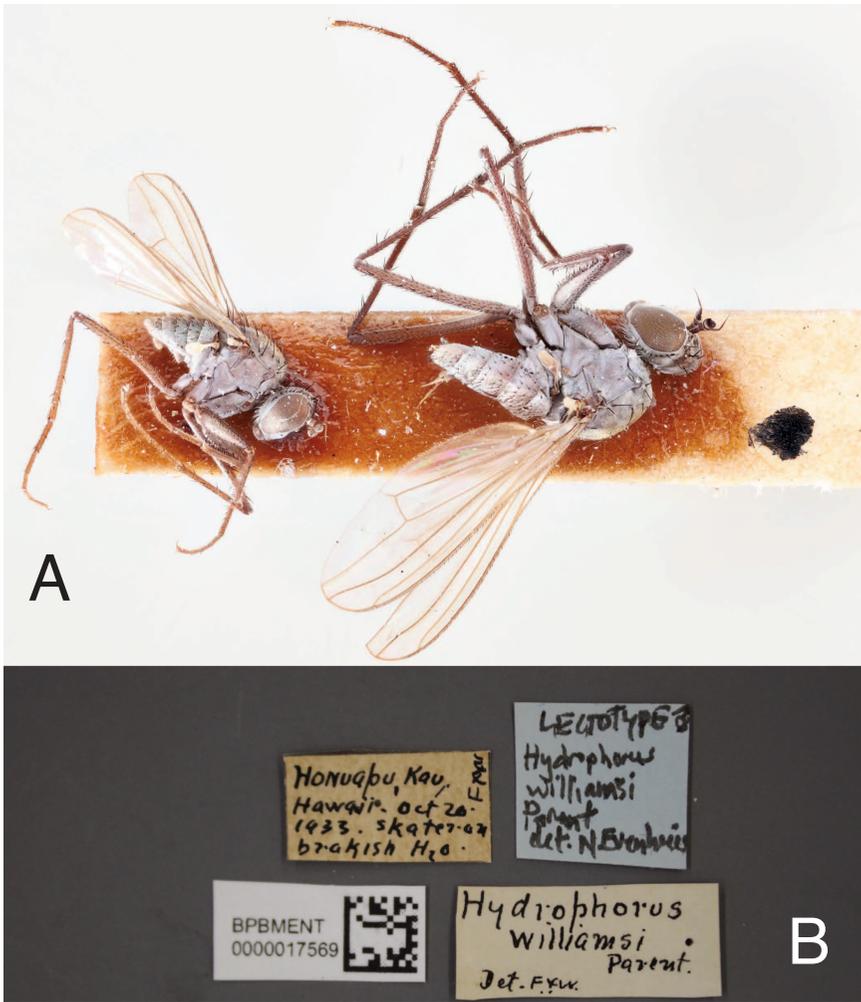


Figure 12. Lectotype female of *Hydrophorus williamsi* Parent. **A.** Lateral view of type specimens on paper point (lectotype on right). **B.** Labels.

<b>williamsi</b>	<b>Lectotype ♀</b>	BPBMNT 0000017569
(Fig. 12)		pin

*Hydrophorus williamsi* Parent, 1938: 211. Hardy, 1952: 455; Hardy & Kohn, 1964: 247; Bickel & Dyte, 1989: 405; Nishida, 1992: 98, 1994: 91, 1997: 77, 2002: 95; Grootaert & Evenhuis, 1997: 74; Yang *et al.*, 2006: 245; Grichanov, 2014: 286.

**Published type locality:** HAWAIIAN ISLANDS: **Hawai'i:** "Honuapu" [sic], K'au, 20 October 1933 "brackish water skater", F.X. Williams.

**Label data:** “Honoapu, Kau FXW [‘FXW’ written perpendicular to label text] / Hawaii. Oct 20 - / 1933. skater on / brakish H<sub>2</sub>O [in Williams’s handwriting], “LECTOTYPE ♀ / *Hydrophorus / williamsi* / Parent / det. N.Evenhuis [in Evenhuis’s handwriting]” [light blue label].

**Current status:** *Hydrophorus williamsi* Parent, 1938 [teste Yang *et al.* (2006)].

**Condition:** Right wing torn off at tip, otherwise, lectotype in excellent condition.

**Remarks:** Originally based on an undetermined number of males and females from Honoapu, K‘au, Hawai‘i Island. Hardy & Kohn (1964: 247) mentioned a single specimen in MHNH not labeled as a type. A male and female syntype (now paralectotypes) were located in the BMNH. Two females glued on their side to a single paper point, originally in the HSPA collection, were located in HDOA and transferred to BPBM. The specimen in best condition is here designated as **lectotype female**. The lectotype is the innermost (toward the pin) of the two and is glued on its right side; the paralectotype on the same point is glued on its left side.

The setation of the lectotype on the fore femur is not as distinct as stated in Hardy & Kohn (1964). The wing characters are better in separating the two species known in Hawai‘i (there is brown suffusion along the wing veins in *H. williamsi*; not so in *H. pacificus* Van Duzee).

#### LIST OF DOLICHOPODIDAE LECTOTYPIFICATIONS BY HARDY & KOHN (1964)

The list below includes all species of Dolichopodidae in which phraseology by Hardy & Kohn (1964) qualifies under ICZN *Code* Art. 74.5 as a lectotype designation. Qualifying words are underlined below in the “Phrase” section for each species.

***Campsicnemus acuticornis* Parent, 1940: 225.**

TYPE DEPOSITORY: Lectotype in BMNH.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: “Type in the British Museum (Natural History). [...] The senior author has studied the type and cotypes.” (Hardy & Kohn 1964: 39).

REMARKS: Based on an unspecified number of males and females. Two syntypes are in the BMNH. The one that had the red-ringed type label when Hardy saw it in the 1950s is the lectotype.

***Campsicnemus breviciliatus* Parent, 1940: 225.**

TYPE DEPOSITORY: Lectotype in BMNH.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: “Type in the British Museum (Natural History). The senior author has studied the type.” (Hardy & Kohn 1964: 48).

REMARKS: Based on an unspecified number of males and females. The lectotype designation by Evenhuis (2007: 21) is invalid.

---

***Campsicnemus fimbriatus* Grimshaw, 1901: 13.**

TYPE DEPOSITORY: Lectotype in BMNH.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: "Known only from the type and allotype. Type in the British Museum (Natural History). The following description is based upon the type and allotype". (Hardy & Kohn 1964: 85).

REMARKS: Based on two males and three females.

***Campsicnemus putillus* Parent, 1937b: 80.**

TYPE DEPOSITORY: Lectotype in BMNH.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: "Endemic. Molokai (type locality: "E. Molokai"). Known only from the type. Type in the Hawaiian Sugar Planters' Association." (Hardy & Kohn 1964: 144).

REMARKS: Based on an unspecified number of males and females. The lectotype designation by Evenhuis (2007: 21) is invalid. Hardy &amp; Kohn's (1964: 144) wording suffices for a lectotype designation of the same specimen. A new lectotype label has been added to indicate the designation by Hardy &amp; Kohn in 1964.

***Campsicnemus ridiculus* Parent, 1938: 81.**

TYPE DEPOSITORY: Lectotype in BPBM.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: "Endemic. Molokai (type locality: near Moaula, 2,400 ft.—misspelled "Molaua" in the original description and "Moalua" on the type "). Type in the Hawaiian Sugar Planters' Association." (Hardy & Kohn 1964: 149).

REMARKS: Based on an unspecified number of males. Although only one specimen was located, it is assumed the species description was based on more than one specimen because ranges of numbers of setae are given in the original description.

***Eurynogaster cilifemorata* Parent, 1940: 241.**

TYPE DEPOSITORY: Lectotype in MNHN.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: "Type in Parent's collection at the Museum National d'Histoire Naturelle, Paris. The type is the male specimen from Mt. Olympus." (Hardy & Kohn 1964: 186).REMARKS: Based on an unspecified number of males and females from three localities. Eight syntypes (now paralectotypes) were located in the BMNH. An additional two paralectotype females exist in BPBM (*vide supra*).***Eurynogaster obscurifacies* Parent, 1937: 244.**

TYPE DEPOSITORY: Lectotype in BPBM.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: "Endemic. Oahu (type locality: Mt. Kaala). Known only from the type male and allotype female. Type in the Hawaiian Sugar Planters' Association." (Hardy & Kohn 1964: 212).

REMARKS: Based on an unspecified number of males and females, although Hardy said the species was known from only the type and allotype. Two syntypes (now paralectotypes) were located in the BMNH, but the asterisk (\*) in Parent's (1940) paper indicates that types of the new species so marked were in the collection of the Hawaiian Entomological Society (at that time in HSPA). Only two specimens (male and female

on one cork stage) were located in this study in the BPBM (transferred earlier from the old HSPA collection in HDOA). The male is the lectotype designated by Hardy & Kohn (1964) and is marked on the stage to identify it from the female.

***Chrysotus saxatilis* Grimshaw, 1901: 16.**

TYPE DEPOSITORY: Lectotype in BMNH.

PHRASE THAT QUALIFIES AS LECTOTYPE DESIGNATION: “[*Eurynogaster luteihalterata* Parent] **New synonymy** [emphasis in Hardy & Kohn 1964], based upon comparison of type (in the British Museum) with the type of *saxatilis* Grimshaw. [...] Type in the British Museum (Natural History).” (Hardy & Kohn 1964: 218).

REMARKS: Based on an unspecified number of males and females. Three syntype males are in the BMNH. The male that had the red-ringed type label at the time Hardy saw it in the 1950s is the lectotype.

### ACKNOWLEDGMENTS

I thank the late C.E. (Peter) Dyte for support, advice and allowing me to pick his brain for information on Dolichopodidae history and taxonomy over the decades. Itemized numbers of specimens of *Eurynogaster* types in BMNH were provided to me long ago by Peter Dyte on a copy of an old dot matrix computer printout (dated 24 September 1985) with his marginalia. A more recent spreadsheet of types provided to me by Ashley Kirk-Spriggs in 2021 corroborated much of Dyte’s printout and he is thanked for his assistance. Lisha Jesper is thanked for providing the photographs of the types and labels. Dan Bickel is thanked for his review of and comments on the paper.

### REFERENCES

- Abdelsalam, K.M.** 2019. First record of a larva of the dipteran genus *Aphrosylus* Haliday, 1851 (Dolichopodidae) from the Egyptian Mediterranean Sea. *Polish Journal of Entomology* **88**(2): 79–92.
- Arnaud, P.H., Jr., V.** 1979. Catalog of the types of Diptera in the California Academy of Sciences. *Myia* **1**, v + 505 pp.
- Asquith, A. & Messing, R.** 1993a. Annotated insect distribution records for the island of Kaua‘i. *Proceedings of the Hawaiian Entomological Society* **31**[1992]: 151–156.
- Asquith, A. & Messing, R.** 1993b. Contemporary Hawaiian insect fauna of a lowland agricultural area on Kaua‘i: implications for local and island-wide fruit fly eradication programs. *Pacific Science* **47**(1): 1–16.
- Beardsley, J.W.** 1966. Insects and other terrestrial arthropods from the leeward Hawaiian Islands. *Proceedings of the Hawaiian Entomological Society* **19**(2): 157–185.
- Bickel, D.J.** 1987. A revision of the Oriental and Australasian *Medetera* (Diptera: Dolichopodidae). *Records of the Australian Museum* **39**(4): 194–259.
- Bickel, D.J.** 1996. Australian *Asyndetus* Loew and *Cryptophleps* Lichtwardt (Diptera: Dolichopodidae), with notes on the Oriental and western Pacific faunas. *Invertebrate Taxonomy* **10**(6): 1151–1170.
- Bickel, D.J. & Dyte, C.E.** 1989. Family Dolichopodidae, pp. 393–418. In: Evenhuis, N.L. (ed.), Catalog of the Diptera of the Australasian and Oceanian regions. *Bishop Museum Special Publication* **86**, 1155 pp.

- 
- Bickel, D.J. & Sinclair, B.J.** 1997. The Dolichopodidae (Diptera) of the Galápagos Islands, with notes on the New World fauna. *Entomologica Scandinavica* **28**: 241–270.
- Brown, R.W.** 1956. *Composition of scientific words: a manual of methods and a lexicon of materials for the practice of logotechnics*. Published by the author. 882 pp.
- Bryan, E.H., Jr.** 1926. Diptera, pp. 67–71. In: Bryan, E.H., Jr. and collaborators, Insects of Hawaii, Johnston Island and Wake Island. *Bernice P. Bishop Museum Bulletin* **31**, 94 p
- Bryan, E.H., Jr.** 1934. A review of the Hawaiian Diptera, with descriptions of new species. *Proceedings of the Hawaiian Entomological Society* **8**: 399–468.
- Caspers, H.** 1966. Verbreitung und Farbanpassung der Strandfauna im Gebiet des schwarzen Lavasandes auf Hawaii. *Internationale Revue der Gesamten Hydrobiologie* **51**(1): 3–13.
- Chursina, M.A., Negrobov, O.P. & Selivanova, O.V.** 2016. A comparative description of the thorax chaetotaxy of the Dolichopodidae (Diptera). *Turkish Journal of Zoology* **40**(4): 499–512.
- Dyte, C.E.** 1959. Some interesting habits of larval Dolichopodidae (Diptera). *The Entomologist's Monthly Magazine* **95**: 139–143.
- Englund, R.A.** 2000a. Report on aquatic insects monitoring of May 2000 in Pelekunu Valley, Moloka'i, Hawai'i. Report submitted to TNCH Moloka'i Office, Kualapu'u, Moloka'i by the Hawaii Biological Survey, Honolulu. 3 pp.
- Englund, R.A.** 2001. Report on long-term aquatic insect monitoring by Hawaii Biological Survey, Bishop Museum in Pelekunu Valley, Moloka'i, Hawai'i. Report submitted to the Nature Conservancy Hawai'i, Moloka'i Office, Kualapu'u by the Hawaii Biological Survey, Honolulu. 12 pp.
- Englund, R.A. & Arakaki, K.** 2003. Report on long-term aquatic insect monitoring in 2002 by Hawaii Biological Survey, Bishop Museum in Pelekunu Valley, Moloka'i, Hawai'i. Report submitted to the Nature Conservancy Hawai'i, Moloka'i Office, Kualapu'u by the Hawaii Biological Survey, Honolulu. 10 pp.
- Englund, R.A. Arakaki, K., Preston, D.J., Coles, S.L. & Eldredge, L.G.** 2000a. Nonindigenous freshwater and estuarine species introductions and their potential to affect sportfishing in the lower stream and estuarine regions of the south and west shores of Oahu, Hawaii. *Bishop Museum Technical Report* **17**: i–viii, 1–121.
- Englund, R.A. & Polhemus, D.A.** 2001. Evaluating the effects of introduced rainbow trout (*Onchorhynchus mykiss*) on native stream insects on Kauai Island, Hawaii. *Journal of Insect Conservation* **5**(4): 265–281.
- Englund, R.A. Polhemus, D.A. & Preston, D.J.** 1998. Assessment of the suitability of Kokee State Park streams as habitat for year-round catch and release fishing for rainbow trout without annual stocking. Report prepared for Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources by the Hawaii Biological Survey, Honolulu. 40 pp.
- Englund, R.A. Polhemus, D.A. & Preston, D.J.** 2000b. Assessment of the impacts of rainbow trout predation on native invertebrate species within Kōke'e State Park streams, Kaua'i, Hawai'i. *Bishop Museum Technical Report* **18**: 1–125.

- 
- 
- Englund, R.A., Wright, M.G. & Polhemus, D.A.** 2007. Aquatic insects as indicators of aquatic species richness, habitat disturbance, and invasive species impacts in Hawaiian streams. *In*: Evenhuis, N.L. & Fitzsimons, J.M. (eds.), *Biology of Hawaiian streams and estuaries. Bishop Museum Bulletin in Cultural and Environmental Studies* **3**: 207–232.
- Evenhuis, N.L.** 2005. A review of the genera comprising species of the genus *Eurynogaster sensu* Hardy & Kohn, 1964 in Hawai'i (Diptera: Dolichopodidae). *Zootaxa* **1017**: 39–60.
- Evenhuis, N.L.** 2007. Lectotype designations for Hawaiian *Campsicnemus* Haliday (Diptera: Dolichopodidae). *In*: Evenhuis, N.L. & Eldredge, L.G. (eds.), *Records of the Hawaii Biological Survey for 2006. Bishop Museum Occasional Papers* **95**: 17–37.
- Evenhuis, N.L.** 2016. Simply *ridiculus*: new species of the *Campsicnemus ridiculus* group from Hawai'i and the Marquesas (Diptera: Dolichopodidae). *In*: Evenhuis, N.L. (ed.), *Records of the Hawaii Biological Survey for 2015. Bishop Museum Occasional Papers* **118**: 33–38.
- Evenhuis, N.L. & Eldredge, L.G.** 2003. Index. *In*: Evenhuis, N.L. & Eldredge, L.G. (eds.), *Natural history of Necker and Nihoa. Bishop Museum Bulletin in Cultural and Environmental Studies* **1**: 217–220.
- Goodman, K.R., Evenhuis, N.L., Bartošová-Sojtková, P. & O'Grady, P.M.** 2014. Diversification in Hawaiian long-legged flies (Diptera: Dolichopodidae: *Campsicnemus*): biogeographic isolation and ecological adaptation. *Molecular Phylogenetics and Evolution* **81**: 232–241.
- Goodman, K.R., Evenhuis, N.L., Bartošová-Sojtková, P. & O'Grady, P.M.** 2016. Multiple, independent colonizations of the Hawaiian Archipelago by the family Dolichopodidae (Diptera). *PeerJ* **4**: e2704: 21 pp.
- Gričhanov, I.Y.** 2014. Alphabetic list of generic and specific names of predatory flies of the epifamily Dolichopodidae (Diptera). *All-Russian Institute of Plant Protection RAAS, Plant Protection News, Supplements* **14**: 4–544.
- Gričhanov, I.Y.** 2017. Alphabetic list of generic and specific names of predatory flies of the epifamily Dolichopodidae (Diptera). Second edition. *All-Russian Institute of Plant Protection RAAS, Plant Protection News, Supplements* **23**, 563 pp.
- Grimshaw, P.H.** 1901. Diptera. *Fauna Hawaiiensis* **3**(1): 1–78.
- Grootaert, P. & Evenhuis, N.L.** 1997. A new species of *Thinophilus* (Diptera: Dolichopodidae) from the Hawaiian Islands. *In*: Evenhuis, N.L. & Eldredge, L.G. (eds.), *Records of the Hawaii Biological Survey for 1996. Part 1: articles. Bishop Museum Occasional Papers* **48**: 74–77.
- Hardy, D.E.** 1952. Additions and corrections to Bryan's check list of the Hawaiian Diptera. *Proceedings of the Hawaiian Entomological Society* **14**(3): 443–484.
- Hardy, D.E. & Kohn, M.A.** 1964. Dolichopodidae. *Insects of Hawaii* **11**: 1–256.
- Howarth, F.G. & Preston, D.J.** 2002. Baseline survey of arthropods (insects and relatives) of Kahului Airport and environs. Final Report prepared for Edward K. Noda & Associates and State of Hawaii, Department of Transportation by the Hawaii Biological Survey. 93 pp.
- I.C.Z.N.** [International Commission on Zoological Nomenclature] 1999. *International code of Zoological Nomenclature*. Fourth edition. International Trust for Zoological Nomenclature, London. xxix + 306 pp.

- Masunaga, K. & Saigusa, T.** 2010. A revision of the Hawaiian and Wake Island species of the genus *Conchopus* Takagi (Diptera, Dolichopodidae). *Zootaxa* **2729**: 1–35.
- Masunaga, K., Saigusa, T. & Grootaert, P.** 2005. Revision of the genus *Thambemyia* Oldroyd (Diptera: Dolichopodidae) with description of a new subgenus. *Entomological Science* **8**: 439–455.
- McKay, D.C.G.** 1945. Notes on the aggregating marine invertebrates of Hawaii. *Ecology* **26**(2): 205–207.
- Meuffels, H.J.G. & Grootaert, P.** 1984. Dolichopodidae (Diptera) from Papua New Guinea I: The genus *Cymatopus* Kertész with a discussion on *Abetitia* Miller and *Cemocarus* gen. nov. *Indo-Malayan Zoology* **1**: 141–158.
- Mitchell, C., Ogura, C., Meadows, D.W., Kane, A., Strommer, L., Fretz, S., Leonard, D. & McClung, A.** 2005. *Hawaii's comprehensive wildlife conservation strategy*. Department of Land and Natural Resources. Honolulu, Hawai'i. 722 pp.
- Moody, K.N., Gagne, R.B., Heim-Ballew, H., Alda, F., Hain, E.F., Lisi, P.J., Walter, R.P., Higashi, G.R., Hogan, J.D., McIntyre, P.B., Gilliam, J.F. & Blum, M.J.** 2017. Invasion hotspots and ecological saturation of streams across the Hawaiian Archipelago. *Cybium* **41**(2): 127–156.
- Negrobov, O.G.** 1977. Dolichopodidae [Lieferung 316]. *Die Fliegen der palaearktischen Region* **4**(5): 347–386.
- Nishida, G.M.** 1992. Hawaiian terrestrial arthropod checklist. *Bishop Museum Technical Report* **1**:
- Nishida, G.M.** 1994. Hawaiian terrestrial arthropod checklist. Second edition. *Bishop Museum Technical Report*
- Nishida, G.M.** 1997. Hawaiian terrestrial arthropod checklist. Third edition. *Bishop Museum Technical Report*
- Nishida, G.M.** 2002. Hawaiian terrestrial arthropod checklist. Fourth edition. *Bishop Museum Technical Report* **22**: i–iv, 1–313.
- Oldroyd, H.** 1964. *The natural history of flies*. Weidenfeld & Nicolson, London. xiv + 324 pp.
- Parent, O.** 1934. Diptères dolichopodides exotiques. *Mémoires de la Société National des Sciences Naturelles et Mathématiques de Cherbourg* **41**: 257–308, pls. 67–79.
- Parent, O.** 1937a. Diptères dolichopodides espèces et localités nouvelles. *Bulletin et Annales de la Société Entomologique de Belge* **77**: 125–148.
- Parent, O.** 1937b. Quelques diptères dolichopodides des Iles Hawai'i [part]. *Konowia* **16**: 67–84.
- Parent, O.** 1938. Quelques diptères dolichopodides des Iles Hawaii [concl.]. *Konowia* **16**: 209–219.
- Parent, O.** 1940. Dolichopodides des Iles Hawaii recueillis par Monsieur F.W. Williams, principalement au cours de l'année 1936. *Proceedings of the Hawaiian Entomological Society* **10**(2)[1939]: 225–249.
- Polhemus, D.A.** 1991. A preliminary report on the aquatic insect fauna of lower Pelekunu Valley, Molokai, Hawaii. Bishop Museum Applied Research Group Life Sciences Report, Honolulu. 5 pp.
- Polhemus, D.A.** 1992. A preliminary report on the aquatic insect fauna of Waikolu Stream, Molokai, Hawaii. Report prepared for Hawai'i Department of Land and Natural Resources, Division of Aquatic resources by the Applied Research Group, Bishop Museum, Honolulu. 6 pp.

- 
- Polhemus, D.A.** 1993. A survey of the aquatic insect fauna of Palikea and Pipiwai streams, Kīpahulu Valley, Maui, Hawaii. Report prepared for Hawaii Department of Land and Natural Resources, Division of Aquatic resources by the Department of Natural Sciences, Bishop Museum, Honolulu. 8 pp.
- Polhemus, D.A.** 1994. A preliminary report on the aquatic insect fauna of Manawainui Stream, East Maui, Hawaii. Report prepared for Hawaii Department of Land and Natural Resources, Division of Aquatic Resources by the Department of Natural Sciences, Bishop Museum, Honolulu. 3 pp.
- Polhemus, D.A.** 1996. A survey of the aquatic insect faunas of selected Hawaiian streams. Revised edition. Report prepared for the Hawaii State Commission on Water Resource Management by the Hawaii Biological Survey, Honolulu. 131 pp.
- Radovsky, F.J.**, Samuelson, G.A. & Steffan, W.A. 1976. Catalog of the entomological types in the Bernice P. Bishop Museum. *Pacific Insects* **17**(1): 1–5.
- Smith, M.E.** 1952. Immature stages of the marine fly, *Hypocharassus pruinosus* Wh., with a review of the biology of immature Dolichopodidae. *American Midland Naturalist* **48**(2): 421–432.
- Souza, E.S.H.** 2017. Diversidade, abundância e binomia de moscas predadoras (Diptera: Dolichopodidae) em propriedades produtoras de hortaliças em sistemas de base ecológica. Unpublished doctoral dissertation, Universidade de Brasília. Pp. i–xiii + 14–97.
- Suehiro, A.** 1960. Insects and other arthropods from midway Atoll. *Proceedings of the Hawaiian Entomological Society* **17**(2): 289–298.
- Sunose, T. & Satô, M.** 1994. Morphological and ecological studies on a marine dolichopodid fly, *Conchopus borealis* Takagi (Diptera, Dolichopodidae). *Japanese Journal of Entomology* **62**(4): 651–660.
- Takagi, S.** 1965. A contribution to the knowledge of the marine shore Dolichopodidae of Japan (Diptera). *Insecta Matsumurana* **27**(2): 49–84.
- Tenorio, J.M.** 1969. Diptera: Dolichopodidae. Appendix (Phoridae). *Insects of Hawaii* **11**(Supplement), v + 73 pp.
- Van Duzee, M.C.** 1933. New Dolichopodidae from the Hawaiian Islands (Diptera). *Proceedings of the Hawaiian Entomological Society* **8**(2): 307–356.
- Williams, F.X.** 1938. *Asyndetus carcinophilus* Parent (Diptera, Dolichopodidae). *Proceedings of the Hawaiian Entomological Society* **10**(1): 126–129.
- Williams, F.X.** 1940. Biological studies in Hawaiian water-loving insects. Part III. Diptera or flies. B. Asteiidae, Syrphidae and Dolichopodidae. *Proceedings of the Hawaiian Entomological Society* **10**(2)[1939]: 281–315.
- Yang D., Zhu, Y., Wang M. & Zhang L.** 2006. *World catalog of Dolichopodidae (Insecta: Diptera)*. China Agricultural University Press, Beijing. vii + 704 pp.