

SYNOPSIS OF POLYNESIAN PSYCHODIDAE

(Diptera)

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This synopsis has been prepared to bring together the existing information on Polynesian Psychodidae, to give keys for the identification of the flies, and a summary of distribution for zoogeographic purposes. With recent studies on Hawaiian and Micronesian psychodids now completed (Quate, 1954, 1959) this will give as complete a taxonomic treatment of Oceanic psychodids as is now possible.

Gaps still exist in our knowledge of Pacific psychodids. Nearly all the specimens treated came from Fiji and Samoa. Nothing is known of the psychodids of the Society, Tuamotu or Marquesas Islands and it is unlikely that this deficiency will be remedied in the foreseeable future. Specimens from the Papuan and Malayan subregions, now on hand, will be studied later.

The area under consideration is the Eastern Melanesia (Fiji) and Central Polynesia (Samoa, etc.), subdivisions of the Polynesian Subregion in a zoogeographic sense (Gressitt, 1956, *Systematic Zool.* 5: 11). Psychodid collections from here are fragmentary and do not approach the completeness of collections from Micronesia or Hawaii. Most of the known species are common, widespread forms that are probably introduced. If there is an endemic fauna, it is not evident from present data.

This paper is based chiefly on specimens at the Bishop Museum collected by J. L. Gressitt, W. R. Kellen, N. L. H. Krauss, O. H. Swezey and E. C. Zimmerman, to whom I express my appreciation for their work in collecting these small flies. The material represents only one undescribed species, but extends the distribution of a number of others well beyond their previously known range.

For the sake of completeness, species described by Satchell (1950, 1953) and Edwards (1928) have been included, although specimens of some of their species were not seen.

In Fiji and Samoa there are now known 21 species of Psychodidae in four genera. Most species belong to the genus *Psychoda* (13 species). *Telmatoscopus* and *Brunettia* (three species each) are next best represented. *Lepidopsychoda*, the taxonomic status of which is not clearly understood, is poorly represented by one species. The large continental genera *Pericoma* and *Phlebotomus* are entirely absent, as they are from other oceanic islands.

A strong relationship with Micronesia is shown by the Polynesian psychodids with a little more than half of the species occurring in both regions. However, this is to be expected since the environments are similar and most of the Pacific psychodids seem to be introduced species that are easily dispersed.

List of Polynesian Psychodidae

	Fiji	Samoa	Other localities
1. <i>Telmatoscopus vitiensis</i>	×		
2. <i>T. inusitatus</i>	×		
3. <i>T. albipunctatus</i>			Tahiti, tropicopolitan
4. <i>T. (Minioceros) squamalatus</i>	×	×	Micronesia
5. <i>Brunettia biformis</i>	×	×	Micronesia
6. <i>B. similis</i>		×	
7. <i>B. sexpunctata</i>	×		
8. <i>Lepidopsychoda tineiformis</i>	×	×	
9. <i>Psychoda makati</i>	×	×	Cook Is., Australia, Philippines
10. <i>P. magnipalpus</i> , n. sp.		×	
11. <i>P. malleopenis</i>		×	
12. <i>P. aponesos</i>		×	Caroline Is.
13. <i>P. alternata</i>	×	×	Cosmopolitan
14. <i>P. adumbrata</i>		×	Micronesia
15. <i>P. cochlearia</i>		×	Micronesia
16. <i>P. ochra</i>		×	Micronesia
17. <i>P. wirthi</i>		×	Hawaii
18. <i>P. yapensis</i>		×	Caroline Is.
19. <i>P. rarotongensis</i>	×	×	Cook Is., Micronesia, Solomon Is., Okinawa, Ryukyu Is., Hawaii, U. S. A., West Indies
20. <i>P. savaiiensis</i>		×	
21. <i>P. quadrifilis</i>	×	×	Tonga, Micronesia, Hawaii

KEY TO POLYNESIAN GENERA OF PSYCHODIDAE

1. Palpal segment 1 much shorter than 2, about 1/3 or 1/4 its length 2
 Palpal segment 1 subequal to or but little shorter than 2 3
2. Radial fork near center of wing, well removed from base of R₄..... **Telmatoscopus**
 Radial fork near base of wing, distad of base of R₄ by distance equal to no more than widest part of cell R₂ **Brunettia**
3. Wing without hairs or scales on membrane **Psychoda**
 Wing with scales on membrane **Lepidopsychoda**

Genus *Telmatoscopus* Eaton

KEY TO POLYNESIAN SPECIES OF TELMATOSCOPIUS

1. Wing not densely covered with scales over entire surface; terminal antennal segments not greatly reduced in size..... 2
 Wing densely covered with iridescent scales over entire surface; terminal 3 antennal segments reduced in size, about 1/2 as large as preceding segments.....
 **T. (Minioceros) squamalatus**
2. Radial and medial forks on or nearly on same level; wing rather narrow..... 3

- Radial fork well distad of medial by distance equal to width of cell R_3 at point of bifurcation; wing broad..... **albipunctatus**
3. Many 3 to 5-branched ascoids on each flagellar segment; ♂ with eyes separated by width equal to $1\frac{1}{2}$ facets..... **vitiensis**
- Pair of simple ascoids on each flagellar segment; ♂ with eyes narrowly separated, almost touching **inuitatus**

Telmatoscopus albipunctatus (Williston). Quate, 1959, Ins. Micronesia (Bishop Mus.) **12**(4): 452.

DISTRIBUTION: Tropicopolitan.

SOCIETY IS. TAHITI: Papeete, 12 Dec. 1924, J. M. Clements.

This large, well marked species is easily recognized. Distinguishing features are the white antenna, white spots at the tips of the veins, the broad wings without scales, the racquet shape of ♂ aedeagus and the simple ♀ genitalia.

Future collecting undoubtedly will show *albipunctatus* to be more widely distributed in the South Pacific than the present record indicates, for it is abundant and widespread in other parts of the Pacific.

Telmatoscopus vitiensis Satchell, 1950, R. Ent. Soc. London, Proc., ser. B, **19**: 176 (Viti Levu).

DISTRIBUTION: Fiji.

According to Satchell's description (*loc. cit.*), this species is mealy colored with blackish wings and white rings on the legs. The antennal ascoids of ♂ are three to five-branched and there are many per segment. The female has a single pair of multibranched ascoids on each segment. The male genitalia is marked by the very long basal piece of the aedeagus, which extends basad of the basistyle by a distance equal to little more than twice the length of that appendage.

Telmatoscopus inuitatus Satchell, 1950, R. Ent. Soc. London, Proc., ser. B, **19**: 178 (Viti Levu).

DISTRIBUTION: Fiji.

No specimens of this species were seen, but Satchell's description (*loc. cit.*) show it to be a distinct form readily recognized by the peculiar ♂ genitalia in which the dististyle has a thumb-like protrusion a little beyond the center and the aedeagus is elongate symmetrical with three sclerotized teeth at the apex. The antennal ascoids are composed of simple curved stalks. The vestiture is uniformly gray like that of most species of *Psychoda*.

Telmatoscopus (Minioceros) squamalatus Quate, 1959, Ins. Micronesia (Bishop Mus.) **12**(4): 455.

DISTRIBUTION: Caroline Is., S. Mariana Is., Samoa, Fiji.

SAMOA. SAVAII: Sili, Feb. 1955, Krauss. TUTUILA: 17 Mar. 1951, 2 Dec. 1956, Kellen; Pago Pago, 10, 14 Feb. 1957, light trap, Kellen. FIJI. VITI LEVU: Mar. 1955, Krauss.

This is an unusual species with iridescent scales on the wings and body, like many species of *Brunettia*, and with reduced terminal antennal segments, like species of *Psychoda*. In spite of these anomalies, *squamalatus* shows its relationship to *Telmatoscopus* by the wing venation and genitalic characters. At the present, it is known only from the Pacific and continental relatives are unknown.

Genus BRUNETTIA Annandale

KEY TO POLYNESIAN SPECIES OF BRUNETTIA

1. Radial and medial forks on about same level or radial little basad of medial 2
Radial fork basad of medial by distance equal to apical width of cell R₂ **similis**
2. Palpal segment 1 about 4 × length of 2; wing with 9 white spots on margin;
♂ with eyes contiguous **biformis**
Palpal segments 1 and 2 subequal in length; wing with 6 white spots on margin;
♂ with eyes widely separated **sexpunctata**

Brunettia biformis Edwards, 1928, *Insects of Samoa* (Brit. Mus., N. H.) **6** (2): 68. —Satchell 1950, *R. Ent. Soc. London, Proc., ser. B*, **19**: 184 (Fiji); 1953, *ibid.* **22**: 185 (Upolu and Manono, Samoa; Suva, Fiji). —Quate, 1959, *Ins. Micronesia* (Bishop Mus.) **12** (4): 447 (Micronesia; geographical segregation).

DISTRIBUTION: Micronesia, Samoa, Fiji.

SAMOA. SAVAH: Puapua, Feb. 1955, Krauss. UPOLU: Feb. 1955, Krauss; Afiamalu, 15 June 1940, 670 m, Swezey; Tapatapao, 20 July 1940, 305 m, Swezey and Zimmerman. TUTUILA: 2 Dec. 1956, Kellen. FIJI. VITI LEVU: Vunindawa, 2 May 1941, Krauss.

Brunettia similis Satchell, 1953, *R. Ent. Soc. London, Proc., ser. B*, **22**: 187 (Upolu).

DISTRIBUTION: Samoa.

Brunettia sexpunctata Satchell, 1950, *R. Ent. Soc. London, Proc., ser. B*, **19**: 183 (Viti Levu).

DISTRIBUTION: Fiji.

The three Polynesian species of *Brunettia* are closely related, but not difficult to identify on the basis of the characters given in the key. However, studies of Micronesian forms of *biformis* show that different islands have their own individual forms and in that region there is only one widespread, variable species. Additional specimens from Polynesia may show that the same condition exists here and instead of three species, there may be one or two with an array of geographical segregates on the various islands. This will make their identification more difficult than it now appears to be.

Genus LEPIDOPSYCHODA Edwards

Lepidopsychoda tineiformis Edwards, 1928, *Ins. Samoa* (Brit. Mus., N. H.) **6**(2): 72 (Upolu; Viti Levu).

DISTRIBUTION: Samoa, Fiji.

Specimens of this species have not been seen, but according to Edwards' description it is recognizable by being much like species of *Psychoda* except there are scales on the wings and ♂ surstyle bears two tenacula. It seems as if it might be related to the genus *Threticus* (Quate, 1959, Ent. Soc. Amer., Ann. 52: 444), but it will take a study of the type to determine its relationship.

One other species from Java has been assigned to the genus.

Genus PSYCHODA Latreille

KEY TO POLYNESIAN SPECIES OF PSYCHODA

1. Antenna with 16 segments 2
- Antenna with 14 or 15 segments 5
- 2 (1). Bases of R₃ and M₂ present, radial and medial forks complete 3
- Bases of R₃ and M₂ absent, radial and medial forks incomplete **makati**
- 3 (2). Palpus segment 1 nearly as long as 2 (1:1.1); flagellar segment 1 but little larger than 2, internode as long as node 4
- Palpus segment 1 about 1/2 as long as 2; flagellar segment 1 with node considerably larger than that of 2, internode about 1/2 as long as node **magnipalpus**
- 4 (3). Costa with long brush of hairs at base; eyes separated by distance equal to 5 facets (♀ unknown)..... **malleopenis**
- Costa without long brush of hairs; eyes separated by distance equal to less than 2 facets **aponesos**
- 5 (1). Wing veins without brown spots at tips 6
- Veins with brown spots at tips **alternata**
- 6 (5). Wing without brown markings 7
- Wing with 4 transverse, brown bands (on membrane as well as on vestiture) **adumbrata**
- 7 (6). Bases of R₃ and M₂ present, radial and medial forks complete 8
- Bases of R₃ and M₂ absent, radial and medial forks incomplete **wirthi**
- 8 (7). Ascoids of ♂ antenna Y-shaped; ♀ subgenital plate without rosette-like structure on internal face and basal margin without median projection 9
- Ascoids of ♂ with 3 anterior branches; ♀ subgenital plate with rosette-like structure on internal face or with strong, distal projection on midline 11
- 9 (8). Dististyle of ♂ genitalia simple, without projection; ♀ subgenital plate without dark, collar-like structure on internal face 10
- Dististyle with thumb-like projection near center; ♀ subgenital plate with dark, collar-like structure on internal face **yapensis**
- 10 (9). Antenna with 14 segments; ♂ surstyle long and slender; ♀ subgenital plate without setose lobes on internal face **cochlearia**
- Antenna with 15 segments, 13 and 14 solidly fused; ♂ surstyle short and stocky; ♀ subgenital plate with pair of setose lobes on internal face at base of genital digit **ochra**
- 11 (8). Lateral shaft of ♂ aedeagus short, about 1/4 as long as main shaft; ♀ sub-

- genital plate with pair of rosette-like structures on internal face.....
 *rarotongensis*, *savaiiensis*
 Lateral shaft of ♂ aedeagus long, extends beyond apex of main shaft; ♀
 subgenital plate without rosette-like structures *quadrifilis*

Psychoda makati del Rasario, 1936, Philippine Jour. Sci. 59: 568 (Philippines). — Satchell, 1953, Austral. Jour. Zool. 1 (3): 372 (Australia).

Psychoda infurcis Satchell, 1950, R. Ent. Soc. London, Proc., ser. B, 19: 180 (Rarotonga, Cook Is.).

DISTRIBUTION: Cook Is., Samoa, Fiji, Australia, Philippines.

SAMOA. UPOLU; Afiamalu, 12 June 1940, at light, 670 m, Swezey and Zimmerman.

FIJI. VANUA LEVU: Lambasa, 5 Oct. 1955, Gressitt.

This species should be easily distinguished from other Polynesian *Psychoda* by the 16-segmented antenna and incomplete forks of the wing in addition to the V-shaped ♀ subgenital plate and the recurved lateral piece of the ♂ aedeagus.

Psychoda magnipalpus Quate, n. sp. Fig. 1a-c.

Male: Eyes separated by distance equal to $2\frac{1}{2}$ facets; eye bridge with 4 rows of facets, rounded on median margin; frons with band of hairs extending posteriorly to level of lower edge of eye bridge. Labellum with 4 (?) teeth and 2 spines; palpus enlarged, as wide as node of flagellar segment 2, covered with scales, ratio of segments 5:8:12:15.

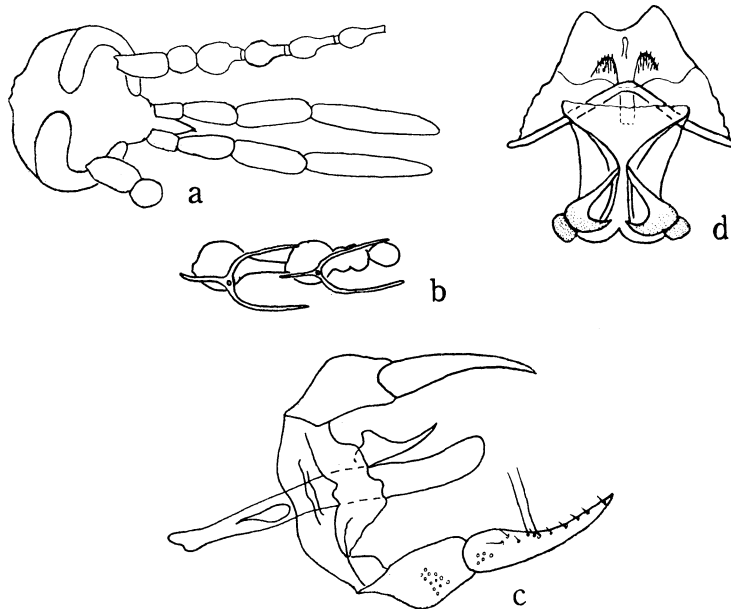


Fig. 1, a-c, *Psychoda magnipalpus*. a, head; b, antenna tip; c, ♂ genitalia, dorsal view. d, *Psychoda ochra*, ♀ genitalia.

Antenna with 16 segments, basal 4 segments covered with scales, flagellar segment 1 with node noticeably larger than that of 2, internode short, about $\frac{1}{2}$ as long as node; segments 13, 14, 15 solidly fused, 16 separate; ascoids Y-shaped.

Wing with forks complete; costal cell infusate, veins R_3 and M_4 thicker than other veins.

Genitalia as figured; surstyle moderately long, with single tenaculum.

Measurements: antenna 0.9 mm, wing length 1.2 mm, wing width 0.5 mm.

Female: Unknown.

Holotype, ♂ (BISHOP 2913), Tutuila, Samoa, 6 May 1958, light trap, W. R. Kellen.

DISTRIBUTION: Samoa.

The large palpus and short, broad first flagellar segment are distinctive features of this species.

Psychoda malleopenis Satchell, 1953, R. Ent. Soc. London, Proc., ser. B, 22: 182 (Upolu).

DISTRIBUTION: Samoa.

Distinguishing features of this species are the long tuft of hairs on the costa, the 16-segmented antenna, short male surstyle, and aedeagus with the apical enlargement.

Psychoda aponesos Quate, 1959, Ins. Micronesia (Bishop Mus.) 12 (4): 465.

DISTRIBUTION: Caroline Is., Samoa.

SAMOA. TUTUILA: 11 Feb. 1957, 6, 13 May 1958, light trap, Kellen.

This species has 16-segmented antennae with the terminal segments clearly separated. The wing forks are complete. The dististyle of ♂ genitalia is longer than the basistyle, the surstyle is long and slender of the usual *Psychoda* type, and the aedeagus has a sharp, blade-like lateral piece. ♀ genitalia has a subrectangular subgenital plate with the basal rim considerably broader than rest of the plate.

Psychoda alternata Say. Quate, 1959, Ins. Micronesia (Bishop Mus.) 12 (4): 469 (Distr., descr., illus.).

DISTRIBUTION: Cosmopolitan.

SAMOA. TUTUILA: 14 Feb. 1957, 6, 13 May 1958, light trap, Kellen; Naval Station, 13 Aug. 1940, at light, Swezey and Zimmerman. FIJI. VITI LEVU: Tavua, Sept. 1950, Krauss.

P. alternata is the only member of the *alternata* complex known at present in Polynesia, although it is expected that other related species will eventually be found here, since they are known on other, better collected Pacific islands. The brown spots at the tips of the veins and the characteristic tip of the antenna with the terminal three segments progressively decreasing in size and ending in a small buttonlike fifteenth segment separates *alternata* from the other Polynesian species of *Psychoda*.

Psychoda adumbrata Satchell, 1953, R. Ent. Soc. London, Proc., ser. B, 22: 181 (Upolu).

—Quate, 1959, Ins. Micronesia (Bishop Mus.) 12 (4): 472.

DISTRIBUTION: Samoa, Carolines, Marianas.

The brown bands and white vestiture of the wings make this species easily recognized as pinned specimens, an unusual condition for most *Psychoda*. Slide mounts also show the brown markings on the denuded wing and along with the fifteen-segmented antenna, characteristic ♂ genitalia and small, V-shaped ♀ subgenital plate, mounted specimens are not difficult to identify.

Psychoda cochlearia Satchell, 1950 R. Ent. Soc. London, Proc., ser. B, **19**: 181 (Viti Levu).
—Quate, 1959, Ins. Micronesia (Bishop Mus.) **12** (2): 467.

DISTRIBUTION: Samoa, Micronesia, Fiji.

This species may be distinguished from other Polynesian *Psychoda* by the 14-segmented antenna, unmarked wings, simple, but characteristic ♂ genitalia, and ♀ genitalia with the apical lobes partly separated from the rest of the subgenital plate and the large spermathecae.

Psychoda ochra Quate, 1959, Ins. Micronesia (Bishop Mus.) **12** (2): 480. Fig. 1 d.

DISTRIBUTION: Samoa, Micronesia.

SAMOA. TUTUILA: Pago Pago, 14 Feb. 1957, light trap, Kellen.

The vestiture of this species is pale, yellowish-white and differs from the gray or yellow of other species of *Psychoda*; the antenna is 15-segmented and segments 13 and 14 are solidly fused. The most conspicuous feature is ♀ genitalia with the short subgenital plate having a concave basal rim and the large spermathecal supporting structures (fig. 1d; illustration of ♀ genitalia by Quate, 1959, incomplete and new figure given here).

Psychoda wirthi Quate, 1954, Hawaiian Ent. Soc., Proc. **15**: 346 (Hawaii).

DISTRIBUTION: Hawaii, Samoa.

SAMOA. UPOLU: Afiamalu, 7 to 13 June 1940, at light, 670 m, Swezey and Zimmerman. TUTUILA: 6, 13 May 1958, light trap, Kellen; Naval Sta., 16 Aug. 1940, at light, Swezey and Zimmerman; Pago Pago, 14 Feb. 1957, light trap, Kellen.

The 15-segmented antenna with the terminal two segments clearly separated from each other and the incomplete bases of the wing forks readily distinguish *P. wirthi*. This is a rather curious distribution since it is the only *Psychoda* known from Polynesia and Hawaii only.

In view of its attraction to light and the amount of light trapping done in Micronesia, it seems safe to assume that *wirthi* does not occur there at the present time.

Psychoda yapensis Quate, 1959, Ins. Micronesia (Bishop Mus.) **12**: (4): 474.

DISTRIBUTION: Caroline Is., Samoa.

SAMOA. TUTUILA: 6, 23 May 1958, light trap, Kellen; Pago Pago, 14 Feb. 1957, light trap, Kellen; Naval Station, 27 Aug. 1940, at light, Swezey and Zimmerman.

Identification of this species depends on the 14-segmented antenna and the distinctive

♂ and ♀ genitalia. The male aedeagus is a simple shaft and the dististyle has a thumb-like projection near the center. ♀ subgenital plate has a dark, heavily sclerotized, collar-like structure on the internal face.

Psychoda rarotongensis Satchell, 1953, R. Ent. Soc. London, Proc., ser. B, **22**: 183 (Cook Is.).—Quate, 1955, Calif. Univ., Publ., Ent. **10**: 208 (U. S. A.); 1959, Ins. Micronesia (Bishop Mus.) **12** (2): 474.

Psychoda lucia Quate, 1954, Hawaiian Ent. Soc., Proc. **15**: 349 (Hawaii, West Indies).

Psychoda savaiiensis, Tokunaga (not Edwards), 1957, Philippine Jour. Sci. **86**: 366 (Okinawa, Ryukyus).

DISTRIBUTION: Cook Is., Samoa, Fiji, Micronesia, Solomon Is., Okinawa, Ryukyus Is., Hawaii, U. S. A., West Indies.

SAMOA. UPOLU: Afiamalu, 7 to 27 June 1940, at light, 670 m, Swezey and Zimmerman. TUTUILA: 6 May–8 June 1958, light trap, Kellen; Pago Pago, 11–14 Feb. 1957, light trap, Kellen; Naval Station, 13, 14, 18 Aug. 1940, at light, Swezey and Zimmerman. FIJI. VANUA LEVU: Wailevu, 9 Oct. 1955, Gressitt.

This small, gray *Psychoda* is a common, widespread species throughout the Pacific from Asia to Central America. In light trap collections it is often the most abundant psychodid. It would seem that *rarotongensis* is distributed through commerce and eventually will be found to be a tropicopolitan species.

The distinguishing features of *rarotongensis* are the 15-segmented antenna with the diminutive fourteenth segment fused to and often telescoped within the thirteenth (thus easily overlooked), the three anterior branches of the antennal ascoids and the genitalia. No closely related species are known with which it might be confused if the critical characters are clearly seen (with the possible exception of *savaiiensis*, see below).

The species which Tokunaga identified as *savaiiensis* Edwards is certainly the same as *rarotongensis*. The excellent drawing of ♂ genitalia leaves no doubt on this point. However, there is doubt that *savaiiensis* and *rarotongensis* are two separate species as discussed below.

Psychoda savaiiensis Edwards, 1928, Ins. Samoa (Brit. Mus., N. H.) **6** (2): 74 (Savaii).

DISTRIBUTION: Samoa.

I strongly suspect that this is the same species as *rarotongensis*, although Edwards' description and illustrations are not detailed enough to be certain. The basistyle and dististyle of ♂ genitalia and the three-anterior-branched antennal ascoids are the same as *rarotongensis*. The antenna of *savaiiensis* is shown to be 14-segmented, but as explained under *rarotongensis*, the small, fourteenth segment of that species is easily overlooked. However, if this is a distinct species and the drawings are accurate, it would be separable from *rarotongensis* on the basis of the antennal structure.

Psychoda quadrifilis Edwards, 1928, Ins. Samoa (Brit. Mus., N. H.) **6** (2): 73 (Upolu).—Quate, 1959, Ins. Micronesia (Bishop Mus.) **12**: (4): 476.

Psychoda hardyi Quate, 1954, Hawaiian Ent. Soc., Proc. **15**: 348 (Hawaii).

DISTRIBUTION: Samoa, Fiji, Tonga, Micronesia, Hawaii.

SAMOA. UPOLU: Afiamalu, 7, 8, 13 June 1940, at light, 670 m, Swezey and Zimmerman. TUTUILA: 6, 13 May 1958, 23 May 1957, light trap, Kellen; Pago Pago, 14 Feb. 1957, light trap, Kellen. FIJI. VANUA LEVU: Lambasa, 5 Oct. 1955, Gressitt. TONGA. TONGATABU: Nukualofa, Feb. 1956, Krauss.

The antenna of this species is 15-segmented, but the fourteenth segment is very small and fused to the thirteenth. If the antenna contracts during mounting, the fourteenth segment becomes telescoped into the thirteenth and is not visible. The male genitalia differs from that of other species by the long, sword-like lateral shaft which extends beyond the apex of the main shaft. The female subgenital plate is characterized by the dark, apical lobes and the slightly sinuous projection from the midline of the basal rim.

Edwards' illustrations of *quadrifilis* (*loc. cit.*) lack certain critical details and while synonymy with *hardyi* was suspected, it wasn't felt the evidence justified synonymizing the two until the discovery of specimens of *hardyi* were found in the type locality of *quadrifilis*. With this extended distribution of *hardyi* and the facts that the antennal tip, ♀ subgenital plate and coxites of ♂ genitalia of the two are indistinguishable, and that both are common species collected at light in various Pacific islands, *hardyi* was synonymized with *quadrifilis*.

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