

CATALOG OF ENTOMOLOGICAL TYPES IN THE BERNICE

P. BISHOP MUSEUM

Diptera: Culicidae¹By Joaquin A. Tenorio²

Abstract: Holotypes of 27 species of mosquitoes deposited in the Bishop Museum entomological type collection are reported. A summary of the mosquito holdings of Bishop Museum is also presented.

This catalog lists the holotypes of 27 species of mosquitoes in 2 genera and 4 subgenera presently lodged in the Bishop Museum Entomological Type Collection. All but 2 of these holotypes (1 from Malaysia and 1 from the Philippine Islands) are from New Guinea and the Bismarck Archipelago. The genera and subgenera included are as follows: *Aedes* (*Huaedes*) with 1 species; *Aedes* (*Neomacleaya*) with 2; *Aedes* (*Verrallina*) with 4; and *Culex* (*Lophoceraomyia*) with 20 species. Other genera and subgenera of Bishop Museum material are presently being studied by various specialists and, undoubtedly, more holotypes will be deposited in the museum collection. When these studies have finally been completed and results published, a supplement to this catalog will follow.

The holotypes included herein are, in most cases, accompanied by an allotype and slides of genitalia, legs, antennae, and associated larval and pupal skins. In some cases, an allotype was not designated by the author, and in several cases the allotypes have been lost. The pinned holotype of *Culex minjensis* Sirivanakarn is lost; however, slide mounts of genitalia and antennae of the holotype are present in the collection. This kind of information is included in the "Remarks" category under each species. In the "Biotope" category, code numbers of the holotypes are entered if available. These numbers refer to field cards which contain ecological information on the holotypes. These cards are filed, and easily retrievable, in the Department of Entomology, Bishop Museum. The format used in listing other data for each type is further explained in Radovsky et al. (1976).

The Culicidae collection in the Bishop Museum contains approximately 197,000 specimens which include 55,000 pinned adults, 41,000 slide mounts, and about 101,000 specimens, mostly immatures, preserved in alcohol.

The majority of pinned specimens have been sorted to genera and subgenera, and many identified to species. Approximately 1/2 of this material was collected in New Guinea (28,830). The remainder is from the following localities: Ambon I (10,802), Australia (831), Bismarck Archipelago (1070), Borneo (176), Celebes (239), Japan (41), Java (791), Malaysia (147), Micronesia (1456), other Pacific Islands including Hawaiian Is (3895), Philippines (1683), Ryukyu Is (50), Solomon Is (811), Sumatra (15), Taiwan (308), Thailand (62), Vietnam (105), and miscellaneous localities (1785).

Most of the slide mounts are of material from New Guinea (30,520), Bismarck Archipelago (2236), Indonesia (3156), other Pacific Islands (3224), and Solomon Is (1635). Other areas which are also represented, but with fewer number of specimens, are

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Australia, Borneo, Japan, Malaysia, Micronesia, Philippines, Ryukyu Is, Taiwan, Vietnam and Laos. Of about 41,000 mounts, approximately 5000 are not yet sorted to genera.

The alcohol material contains the greatest number of specimens with approximately 101,000. All except about 500 specimens are from New Guinea, and part of these are duplicates of specimens which have been mounted on slides. The remainder of this material is from Ambon I, Bismarck Archipelago, Malaysia, other Pacific Islands, Philippines, Solomon Is, Taiwan, and miscellaneous localities.

Of the total number of mosquitoes now in the Bishop Museum, about 161,000 are from New Guinea and adjacent islands. Much of this material was collected by Bishop Museum staff and collaborators in conjunction with the Mosquitoes of New Guinea Project funded by NIH and U.S. Army grants.

SPECIES-GROUP ENTRIES

- bolii** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7724
 1968 *Pacif. Ins. Monogr.* 17: 100-01 Fig. 4 Pin and Slides
 NEW GUINEA (NE)³: Chimbu District: Kundiava: Mirani Creek near Waghi River 1700 m.
 I.1966 S. Sirivanakarn & M. Awa
 Biting; EH22
 Genitalia and antenna on separate slides EH22: 660711-9.
 ALLOTYPE on pin, buccopharyngeal armature and genitalia slide EH22: 660726-1.
- collessi** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7739
 1968 *Pacif. Ins. Monogr.* 17: 170-74 Fig. 42, 43 Pin and Slides
 BISMARCK ARCHIPELAGO: New Britain I: Keravat: 2 km from Experiment Station near
 Keravat River IV.1966 S. Sirivanakarn
 Grassy drainage ditch near margin of rain forest; NB 49-106.
 Genitalia and antenna slide NB 49-106, larval and pupal skins on separate slide NB 49-106.
 ALLOTYPE on pin: pupal skin slide NB 49-102.
- confusus** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7725
 1968 *Pacif. Ins. Monogr.* 17: 105 Fig. 7 Pin and Slides
 NEW GUINEA (NE): Morobe District: Huon Peninsula: Singuawa River area; 24 km E of
 Lae ± 50 m IV.1966 S. Sirivanakarn
 Ex stream; MR 11
 Abdomen missing, part of it on slide MR11: 660720-8 with genitalia. No ALLOTYPE
 designated. *C. (L.) singuawaensis* Sirivanakarn, 1969, new name for *confusus* Sirivanakarn
 not Baisas, 1938.
- cottlei** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7744
 1968 *Pacif. Ins. Monogr.* 17: 180-84 Fig. 49, 50 Pin and Slides
 BISMARCK ARCHIPELAGO: Admiralty Is: Manus I: Loniu village III.1966 R. Cottle &
 S. Sirivanakarn
 Larva reared ex sago swamp; MN1-10.
 Genitalia and antenna slide MN1-10, larval and pupal skins slide MN1-10. ALLOTYPE
 pinned: pupal skin slide MN12-106.
- cottlei** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7744
 1968 *Pacif. Ins. Monogr.* 17: 180-84 Fig. 49, 50 Pin and Slides
 BISMARCK ARCHIPELAGO: Admiralty Is: Manus I: Loniu village III.1966 R. Cottle &
 S. Sirivanakarn
 Larva reared ex sago swamp; MN1-10.
 Genitalia and antenna slide MN1-10, larval and pupal skins slide MN1-10. ALLOTYPE
 pinned: pupal skin slide MN12-106.

³For purposes of geographic orientation in this section of the Catalog, the terms NE and SE (following New Guinea) refer to the portion of Papua New Guinea known as New Guinea and the portion known as Papua, respectively.

- crowei** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7727
 1968 *Pacif. Ins. Monogr.* 17: 115-17 Fig. 12 Pin and Slides
 NEW GUINEA (NE): Sepik District: Vanimo: Daunda Village II.1966 S. Sirivanakarn
 Under shade of fallen sago leaves and herbs in shallow swamp; SP118.
 Genitalia and antenna slide SP118:660715-10. ALLOTYPE pinned: larval and pupal skins
 slide SP 87-21.
- durhami** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7741
 1968 *Pacif. Ins. Monogr.* 17: 177 Fig. 46 Pin and Slides
 NEW GUINEA (NE): Sepik District: Maprik: Upau Stream near Malaria Laboratory
 II.1966 S. Sirivanakarn
 Ex sago swamp, sweeping; SP19.
 Genitalia and antenna slide SP 19:660916-2. ALLOTYPE pinned.
- embiensis** Huang, *Aedes* (*Verrallina*) HOLOTYPE ♂ 7553
 1968a *Pacif. Ins. Monogr.* 17: 24-26 Fig. 13, 14 Pin and Slides
 NEW GUINEA (SE): Northern District: Popondetta: Little Embi Lakes area 15 m
 V. 1965 P. Shanahan
 Pupa reared ex small ground pool in partial forest; BBM-NGC 2229.
 Genitalia and legs on 2 separate slides 229-1. No ALLOTYPE designated.
- gressitti** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7735
 1968 *Pacif. Ins. Monogr.* 17: 153-55 Fig. 2, 33 Pin and Slides
 NEW GUINEA (NE): Morobe District: Wau: Edie Creek 2000 m IV.1966
 S. Sirivanakarn & J. L. Gressitt
 Ex margin of mining pond; MR 37-10.
 Genitalia and antenna slide MR 27-10, larval and pupal skins slide MR37-10. ALLOTYPE
 pinned: larval and pupal skins slide MR43-102.
- insularis** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7737
 1968 *Pacif. Ins. Monogr.* 17: 166-67 Pin and Slides
 BISMARCK ARCHIPELAGO: New Britain I: Rabaul: Keravat Agricultural Experiment
 Station III.1966 S. Sirivanakarn
 Reared ex shaded ground pool; NB1-15.
 Larval and pupal skins slide NB 1-15. ALLOTYPE pinned: larval and pupal skins slide.
 NB 1-12.
- kaviengensis** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7738
 1968 *Pacif. Ins. Monogr.* 17: 167-70 Fig. 40, 41 Pin and Slides
 BISMARCK ARCHIPELAGO: New Ireland I: Kavieng: Panapaia Village III.1966
 S. Sirivanakarn
 Reared ex sago stump in swamp along the coast; N14-101.
 Genitalia and antenna slide N14-101, pupal skin on separate slide N14-101. ALLOTYPE
 pinned: larval and pupal skins slide N1-103.
- killertonis** Huang, *Aedes* (*Verrallina*) HOLOTYPE ♂ 7554
 1968a *Pacif. Ins. Monogr.* 17: 31-32 Fig. 40, 41 Pin and Slides
 NEW GUINEA (SE): Northern District: Popondetta: Cape Killerton 0-5 m V.1965
 Y. M. Huang & W. A. Steffan
 Malaise trap in partial forest mixed with sago and pandanus vegetation; BBM-NGC 2227.
 Genitalia and legs on 2 separate slides, BBM-NG 2227-110. No ALLOTYPE designated.
- kowiroensis** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7732
 1968 *Pacif. Ins. Monogr.* 17: 133-35 Fig. 21, 22 Pin and Slides
 NEW GUINEA (NE): Sepik District: Wewak: Kowiro Village 240 m III.1966
 S. Sirivanakarn
 Pupa reared ex palm bract; SP154-112.
 Genitalia and antenna slide SP154-112, pupal skin on separate slide SP154-112. ALLOTYPE
 pinned: larval and pupal skins slide SP154-12.
- lakei** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7729
 1968 *Pacif. Ins. Monogr.* 17: 120-22 Fig. 14, 15 Pin and Slides
 NEW GUINEA (SE): Central District: Rigo Road ± 30 m XII.1965 S. Sirivanakarn &
 H. Lake

Deep pond with dense growth of algae, duck weeds, and aquatic herbs; CP 26-107.
Antennal slide CP26-107, larval and pupal skins separate slide CP26-107. ALLOTYPE
pinned: larval and pupal skins slide CP4-91.

- minjensis** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7734
1968 *Pacif. Ins. Monogr.* 17: 151-53 Fig. 31 Slides
NEW GUINEA (NE): Western Highlands District: Minj: Tengen Stream 1500-1700 m
I.1966 S. Sirivanakarn
Biting; WH19.
Pinned HOLOTYPE lost: genitalia and antennae on 2 separate slides WH19:660712-6.
Pinned ALLOTYPE lost.
- muruae** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7731
1968 *Pacif. Ins. Monogr.* 17: 130-31 Fig. 19, 20 Pin and Slides
NEW GUINEA (SE): Gulf District Murua sea level V.1966 S. Sirivanakarn
Flooded sago swamp just above sea level; G25-100.
Genitalia and antenna slide G25-100, pupal skin separate slide G25-100. ALLOTYPE
missing from pin; larval and pupal skins slide G26-103.
- obsoletus** Huang, *Aedes* (*Verrallina*) HOLOTYPE ♂ 7555
1968a *Pacif. Ins. Monogr.* 17: 45-46 Fig. 37, 41 Pin and Slides
NEW GUINEA (SE): Central District: 3 km S of Vanapa River on Brown River Road
200 m V.1965 Y. M. Huang & W. A. Steffan
Malaise trap; BBM-NGC: 2261.
Genitalia and foreleg on 2 separate slides 2261. No ALLOTYPE designated.
- pahangi** Delfinado, *Aedes* (*Neomacleaya*) HOLOTYPE ♀ 8001
1968 *Contrib. Amer. Ent. Inst.* 2(4): 31 Fig. 23 Pin and Slides
MALAYSIA: Malay Peninsula: Pahang: Kuala Terenggan 220 m XII.1958 J. L. Gressitt
Biotope unknown
Genitalia on slide 20.II.66, tarsal claws slide 6.VII.66. No ALLOTYPE designated.
- philippinensis** Delfinado, *Aedes* (*Neomacleaya*) HOLOTYPE ♂ 8000
1968 *Contrib. Amer. Ent. Inst.* 2(4): 33 Fig. 4 Pin and Slides
PHILIPPINES: Leyte I: Mahaplag VII.1964 M. Delfinado
Light trap
Genitalia and legs slide 10.VIII.64 (4.III.66). ALLOTYPE slide missing.
- rajaneae** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7740
1968 *Pacif. Ins. Monogr.* 17: 174-75 Fig. 44 Pin and Slides
BISMARCK ARCHIPELAGO: Admiralty Is: Manus I: Lorengau Village 10 m III.1966
S. Sirivanakarn
Resting on ferns along stream margin in deep shade; MN28.
Genitalia and antennae slide MN28:661207-6. No ALLOTYPE designated.
- schilfgaardei** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7736
1968 *Pacif. Ins. Monogr.* 17: 163-66 Fig. 38, 39 Pin and Slides
NEW GUINEA (NE): Morobe District: Huon Peninsula: 23 km E of Lae: Singuawa River
± 50 m IV.1966 S. Sirivanakarn
Blocked gravel pool in forest stream; MR11-33.
Genitalia and antenna slide MR11-33, pupal skin on separate slide MR11-33. ALLOTYPE
pinned: larval and pupal skins slide MR11-10.
- sedlacekiae** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7743
1968 *Pacif. Ins. Monogr.* 17: 180 Fig. 48 Pin and Slides
NEW GUINEA (NE): Morobe District: Lae-Wau Road: 14 km W of Lae 5-10 m
IV.1965 Y. M. Huang & W. A. Steffan
Malaise trap; BBM-NG 2086
Genitalia and antenna slide NG2086:650817-2. No ALLOTYPE designated.
- shanahani** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7728
1968 *Pacif. Ins. Monogr.* 17: 11-18 Fig. 13 Pin and Slides
NEW GUINEA (SE): Northern District: Popondetta: Cape Killerton: 0.8 km from sea coast
± 10 m IV.1966 S. Sirivanakarn

Mixed forest swamp, resting; NEP 15.

Genitalia and antenna slide NEP15:660810-14. No ALLOTYPE designated.

- steffani** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7726
 1968 *Pacif. Ins. Monogr.* 17: 112-15 Fig. 10, 11 Pin and Slides
 NEW GUINEA (SE): Central District: Rigo Road: 48 km from Port Moresby ± 30 m
 XII.1965 S. Sirivanakarn
 Margin of blocked stream; CP5-10.
 Larval and pupal skins slide CP5-10. Pinned HOLOTYPE in poor condition, only part of
 thorax and 1 wing present. Pinned ALLOTYPE lost; larval and pupal skins slide CP5-12.
- variabilis** Huang, *Aedes* (*Verrallina*) HOLOTYPE ♂ 7557
 1968a *Pacif. Ins. Monogr.* 17: 65-68 Fig. 39, 43, 59, 60 Pin and Slides
 NEW GUINEA (SE): Central District: 3 km S of Vanapa River on Brown River Road
 20 m V.1965 Y. M. Huang
 Edge of large flooded area in virgin forest; BBM-NG 2317-8.
 Genitalia slide YMH-65-128, pupal skin slide BBM-NG 2317-8. ALLOTYPE pinned
 BBM-NG:2317-6; pupal skin slide BBM-NG 2317-6.
- versabilis** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7730
 1968 *Pacif. Ins. Monogr.* 17: 126-30 Fig. 17, 18 Pin and Slides
 NEW GUINEA (NE): Madang District: Gum River area: forest near coconut plantation
 I.1966 S. Sirivanakarn
 Fallen palm bract; MD16-24
 Genitalia, antenna, larval and pupal skins on 4 separate slides MD16-24. ALLOTYPE
 pinned: larval and pupal skins on 2 separate slides MD16-10.
- wamanguae** Sirivanakarn, *Culex* (*Lophoceraomyia*) HOLOTYPE ♂ 7733
 1968 *Pacif. Ins. Monogr.* 17: 135-38 Fig. 23, 24 Pin and Slides
 NEW GUINEA (NE): Sepik District: Wamangu Village near Assembly of God Mission
 60 m III.1966 S. Sirivanakarn
 Decayed sago stump; SP 147-100
 Genitalia, antenna, and pupal skin on 3 separate slides SP147-100. Pinned ALLOTYPE
 lost: pupal skin slide SP147-108.
- wauensis** Huang, *Aedes* (*Huaedes*) HOLOTYPE ♂ 9889
 1968b *J. Med. Ent.* 5(2): 170-71 Fig. 1a-c, 2a-c Pin and Slides
 NEW GUINEA (NE): Morobe District: Wau 1200 m IV.1965 M. Sedlacek
 Reared ex bamboo; BBM-NG 3017.37.
 Genitalia slide 670505-6, larval and pupal skins on 2 separate slides BBM-C 3017.37 No
 ALLOTYPE designated.

GENUS-GROUP INVENTORY

Aedes (*Huaedes*): *wauensis*

Aedes (*Neomacleaya*): *pahangi*, *philippinensis*

Aedes (*Verrallina*): *embiensis*, *killertonis*, *obsoletus*, *variabilis*

Culex (*Lophoceraomyia*): *bolii*, *collessi*, *confusus* (= *singauwaensis*), *cottlei*, *crowei*, *durhami*, *gressitti*,
insularis, *kaviengensis*, *kowiroensis*, *lakei*, *minjensis*, *muruae*, *rajaneae*, *schilfgaardei*, *sedlacek*,
shanahani, *steffani*, *versabilis*, *wamanguae*

Huaedes: subg., see *Aedes* (*Huaedes*)

Lophoceraomyia: subg., see *Culex* (*Lophoceraomyia*)

Neomacleaya: subg., see *Aedes* (*Neomacleaya*)

Verrallina: subg., see *Aedes* (*Verrallina*)

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