CATALOG OF ENTOMOLOGICAL TYPES IN THE BERNICE
P. BISHOP MUSEUM

Diptera: Culicidae

By Joaquin A. Tenorio

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 (Huades) 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

1 Partial results of the Mosquitoes of New Guinea project supported by grants AI07917-07 (NIH) and DADA 17-73-C-3143 (USAMDC).

2 Bernice P. Bishop Museum, P. O. Box 6037, Honolulu, Hawaii 96818, U.S.A.
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)

<table>
<thead>
<tr>
<th>Holotype</th>
<th>7724</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td><em>Pacif. Ins. Monogr.</em>, 17: 100–01 Fig. 4</td>
</tr>
<tr>
<td>NEW GUINEA (NE): Chimbu District: Kundia: Mirani Creek near Waghi River 1700 m.</td>
<td></td>
</tr>
<tr>
<td>1.1966 S. Sirivanakarn &amp; M. Awa</td>
<td></td>
</tr>
<tr>
<td>Biting; EH22</td>
<td></td>
</tr>
</tbody>
</table>

**collessi** Sirivanakarn, Culex (Lophoceraomyia)

<table>
<thead>
<tr>
<th>Holotype</th>
<th>7739</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td><em>Pacif. Ins. Monogr.</em>, 17: 170-74 Fig. 42, 43</td>
</tr>
<tr>
<td>BISMARCK ARCHIPELAGO: New Britain I: Keravat: 2 km from Experiment Station near Keravat River IV.1966 S. Sirivanakarn</td>
<td></td>
</tr>
<tr>
<td>Grassy drainage ditch near margin of rain forest; NB 49-106.</td>
<td></td>
</tr>
<tr>
<td>Genitalia and antenna slide NB 49-106, larval and pupal skins on separate slide NB 49-106.</td>
<td></td>
</tr>
</tbody>
</table>

**confusus** Sirivanakarn, Culex (Lophoceraomyia)

<table>
<thead>
<tr>
<th>Holotype</th>
<th>7725</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td><em>Pacif. Ins. Monogr.</em>, 17: 105</td>
</tr>
<tr>
<td>NEW GUINEA (NE): Morobe District: Huon Peninsula: Singuawa River area; 24 km E of Lae ± 50 m IV.1966 S. Sirivanakarn</td>
<td></td>
</tr>
<tr>
<td>Ex stream; MR ll</td>
<td></td>
</tr>
<tr>
<td>Abdomen missing, part of it on slide MR11: 660720-8 with genitalia. No ALLOTYPE designated. C. (L.) <em>singuawaensis</em> Sirivanakarn, 1969, new name for <em>confusus</em> Sirivanakarn not Baisas, 1938.</td>
<td></td>
</tr>
</tbody>
</table>

**cottlei** Sirivanakarn, Culex (Lophoceraomyia)

<table>
<thead>
<tr>
<th>Holotype</th>
<th>7744</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td><em>Pacif. Ins. Monogr.</em>, 17: 180-84 Fig. 49, 50</td>
</tr>
<tr>
<td>BISMARCK ARCHIPELAGO: Admiralty Is: Manus I: Loniu village III.1966 R. Cottle &amp; S. Sirivanakarn</td>
<td></td>
</tr>
<tr>
<td>Larva reared ex sago swamp; MN1-10.</td>
<td></td>
</tr>
<tr>
<td>Genitalia and antenna slide MN1-10, larval and pupal skins slide MN1-10. ALLOTYPE pinned: pupal skin slide MN1-10.6.</td>
<td></td>
</tr>
</tbody>
</table>

**cottlei** Sirivanakarn, Culex (Lophoceraomyia)

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<td>BISMARCK ARCHIPELAGO: Admiralty Is: Manus I: Loniu village III.1966 R. Cottle &amp; S. Sirivanakarn</td>
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<td>Genitalia and antenna slide MN1-10, larval and pupal skins slide MN1-10. ALLOTYPE pinned: pupal skin slide MN1-10.6.</td>
<td></td>
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</tbody>
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3 For 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 *Pacific. Ins. Monogr.* 17: 115-17 Fig. 12
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 *Pacific. Ins. Monogr.* 17: 177 Fig. 46
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 *Pacific. Ins. Monogr.* 17: 24-26 Fig. 13, 14
NEW GUINEA (SE): Northern District: Popondetta: Little Embi Lakes area 15 m V. 1965 Y. M. Huang & W. A. Steffan
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 *Pacific. Ins. Monogr.* 17: 155-55 Fig. 2, 33
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.

insularis Sirivanakarn, Culex (Lophoceraomyia)  
HOLOTYPE ♂ 7737
1968 *Pacific. Ins. Monogr.* 17: 166-67
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 *Pacific. Ins. Monogr.* 17: 167-70 Fig. 40, 41
Reared ex sago stump in swamp along the coast; N14-101.

killertonis Huang, Aedes (Verrallina)  
HOLOTYPE ♂ 7554
1968a *Pacific. Ins. Monogr.* 17: 31-32 Fig. 40, 41
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 *Pacific. Ins. Monogr.* 17: 133-35 Fig. 21, 22
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 *Pacific. Ins. Monogr.* 17: 120-22 Fig. 14, 15
NEW GUINEA (SE): Central District: Rigo Road ± 30 m XII.1965 S. Sirivanakarn & H. Lake

**minjensis** Sirivanakarn, Culex (Lophoceraomyia)  
1968 *Pacif. Ins. Monogr.*, 17: 151-53 Fig. 31  
NEW GUINEA (NE): Western Highlands District: Minj: Tengen Stream 1500-1700 m L1966 S. Sirivanakarn  
Biting; WH19.  
Pinned HOLOTYPE lost: genitalia and antennae on 2 separate slides WH19:660712-6. Pinned ALLOTYPE lost.

**muruae** Sirivanakarn, Culex (Lophoceraomyia)  
1968 *Pacif. Ins. Monogr.*, 17: 130-31 Fig. 19, 20  
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)  
1968a *Pacif. Ins. Monogr.*, 17: 45-46 Fig. 37, 41  
NEW GUINEA (SE): Central District: 3 km S of Vanapa River on Brown River Road 200 m V.1965 Y. M. Huang & W. A. Steffen  
Malaise trap; BBM-NGC: 2261.  
Genitalia and foreleg on 2 separate slides 2261. No ALLOTYPE designated.

**pahangi** Delfinado, Aedes (Neomacleaya)  
1968 *Contrib. Amer. Ent. Inst.*, 2(4): 31 Fig. 23  
PHILIPPINES: Leyte I: Mahaplag VII.1964 M. Delfinado  
Light trap  

**philippinensis** Delfinado, Aedes (Neomacleaya)  
1968 *Contrib. Amer. Ent. Inst.*, 2(4): 33 Fig. 4  
PHILIPPINES: Leyte I: Mahaplag VII.1964 M. Delfinado  
Light trap  
Genitalia and legs slide 10.VIII.64 (4.III.66). ALLOTYPE slide missing.

**rajaneeae** Sirivanakarn, Culex (Lophoceraomyia)  
1968 *Pacif. Ins. Monogr.*, 17: 174-75 Fig. 44  
BISMARCK ARCHIPELAGO: Admiralty Is: Manus I: Lorengau Village 10 m III.1966 S. Sirivanakarn  
Resting on ferns along stream margin in deep shade; MN28.  

**schilfgaardei** Sirivanakarn, Culex (Lophoceraomyia)  
1968 *Pacif. Ins. Monogr.*, 17: 163-66 Fig. 38, 39  
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.

**sedlacekeae** Sirivanakarn, Culex (Lophoceraomyia)  
1968 *Pacif. Ins. Monogr.*, 17: 180 Fig. 48  
NEW GUINEA (NE): Morobe District: Lae-Wau Road: 14 km W of Lae 5-10 m IV.1965 Y. M. Huang & W. A. Steffen  
Malaise trap; BBM-NG 2086  
Genitalia and antenna slide NG2086:650817-2. No ALLOTYPE designated.

**shanahani** Sirivanakarn, Culex (Lophoceraomyia)  
1968 *Pacif. Ins. Monogr.*, 17: 11-18 Fig. 13  
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.

**stefani** Sirivanakarn, Culex (Lophoceraomyia)  
HOLOTYPE ♂  7726  
1968  *Pacif. Ins. Monogr.* 17: 112-15  
Fig. 10, 11  
NEW GUINEA (SE): Central District: Rigo Road: 48 km from Port Moreseby ± 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  
NEW GUINEA (SE): Central District: Rigo Road: 48 km from 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.  

**versabilis** Sirivanakarn, Culex (Lophoceraomyia)  
HOLOTYPE ♂  7730  
Fig. 17, 18  
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  
Fig. 23, 24  
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  
Fig. 1a-c, 2a-c  
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 (= singuawaensis), cottlei, crowei, durhami, gressitti, insularis, kaviengensis, kowiroensis, lakei, minjensis, muruae, rajaneeae, schilfgaardei, sedlacekiae, shanahani, stefani, versabilis, wamanguae  
Huaedes: subg., see Aedes (Huaedes)  
Lophoceraomyia: subg., see Culex (Lophoceraomyia)  
Neomacleaya: subg., see Aedes (Neomacleaya)  
Verrallina: subg., see Aedes (Verrallina)

LITERATURE CITED


