

The Mosquito Fauna of the Papuan Subregion

Wallace A. Steffan
 Bishop Museum, P. O. Box 6037
 Honolulu, Hawaii 96818

This project was initiated in September 1964 as a "Study of Mosquitoes of the Indonesian-Papuan Area" and was funded for the first three years by the U. S. Army Medical Research and Development Command.¹ Since June 1967, this project has been supported by the National Institutes of Health of the U. S. Public Health Service.² The study area encompasses the Papuan Subregion which includes the following areas: New Guinea and adjacent islands, the Moluccas, South Eastern Islands, South Western Islands, Timor, Bismarck Archipelago, Trobriand Islands, Woodlark Island, D'Entrecasteaux Islands, Louisiade Archipelago and Solomon Islands. The inclusion of Timor in this subregion is debatable and additional material is needed from this area to clarify its position.

The goals of this project are to conduct biological, ecological, and taxonomic investigations of the mosquitoes of the Papuan Subregion. The principal long range objective will be the publication of a comprehensive monograph (in several parts) of the mosquitoes of this subregion.

Field studies are concentrated in the Territory of Papua and New Guinea, Bismarck Archipelago and the Solomon Islands. Also extensive collections were made on Ambon Island in the Moluccas. Loans of additional material for these studies from the Papuan Subregion, especially material from West Irian (Western New Guinea) and the Moluccas, would be greatly appreciated. We would like to build up a world-wide reference collection of adults and immatures and would gladly arrange exchanges of identified species from this area for similar material from other areas. Exchanges of reprints would also be appreciated.

The following taxa have been assigned and are being investigated: Tripteroides, subgenera Rachisoura and Rachionotomyia (Dr. Marks and Dr. Mattingly), Ficalbia (Dr. Mattingly); Aedes (kochi group) (Dr. Dobrotworsky and Dr. Marks); Aedes (various other subgenera) (Dr. Marks); Culex (Dr. Steffan); Toxorhynchites (Dr. Steffan); and Uranotaenia (Dr. Dobrotworsky). The following taxa have been completed but will be revised if additional material warrants it: Aedes (Verrallina) by Yiau-Min Huang, Culex (Lophoceraomyia) by Sunthorn Sirivanakarn, Armigeres by Wallace Steffan, and Orthopodomyia by Thomas Zavortink.

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Staff: In addition to the principal investigator, Wallace A. Steffan, Dr. N. V. Dobrotworsky of the University of Melbourne is working on the project. We have one full-time field associate, 2 technicians, 1 artist and 1 typist. Other collaborators include Dr. E. N. Marks of the University of Queensland and Dr. P. F. Mattingly of the British Museum. Mr. Stan Christian of the Malaria Section at Minj, New Guinea, continues to provide us with valuable material from that area.

The project is based at the Bishop Museum in Honolulu which also has a permanent field station at Wau that is extensively used by our investigators.

The following studies have been completed or are nearing completion:

1. Dobrotworsky, N. and E. N. Marks. Aedes kochi group of New Guinea (including North Queensland and Bougainville I.). (Nearing completion)

Twenty-four species have been described and illustrated, of these 17 are new and 3 forms of uncertain status are described. Nine new life histories are completed. Adults (males and females), pupal and larval stages of 15 of these species are described and illustrated. New information on distribution of species including altitudinal distribution and plant associations of the axil breeding group is presented. The species which have adapted to the cultivated plants have larger populations, are less likely to be isolated into incipient species, and more likely to be man-biting.

2. Huang, Y. M. 1968. Aedes (Verrallina) of the Papuan Subregion (Diptera: Culicidae). Pac. Ins. Monogr. 17: 1-73.

Twenty-eight species of the subgenus Verrallina, of which 5 are described new, are recognized in the Papuan Subregion. The morphological characters, bionomics, distribution, and general importance of all species are described and discussed. Immature stages of Verrallina are found in temporary ground pools, in partially or deeply shaded areas, in sago, pandanus, grassy and forest swamps, and in virgin forest pools. Larvae of 3 species were found infected by a fungus belonging to the genus Coelomomyces which appears to prevent ecdysis and might prove valuable for biological control. Several species are very common and readily attack man during the day as well as night in the vicinity of forest, sago, and mangrove swamps.

3. Huang, Y. M. 1968. A new subgenus of Aedes and an illustrated key to the subgenera of Aedes of the Papuan Subregion. J. Med. Ent. 5(2): 169-188.

A new subgenus Huaedes is proposed for the new species Aedes (Huaedes) wauensis Huang and includes Aedes medialis Brug and Aedes variepictus King and Hoogstraal.

The 109 species in 15 subgenera of Aedes from the Papuan Subregion are listed. Illustrated keys to adults (males and females) and 4th instar larvae of the subgenera of Aedes found in this area are given. Some of the more important characters of adults and larvae are tabulated and the breeding habits of the subgenera of Aedes in this area are summarized.

4. Sirivanakarn, S. 1968. The Culex subgenera Lophoceraomyia in New Guinea and Bismarck Archipelago (Diptera: Culicidae). Pac.Ins. Monogr. 17: 75-185.

Thirty-three species of Lophoceraomyia from New Guinea and the Bismarck Archipelago are described and illustrated, of these 21 are new and 2 extralimital species are recorded from this area for the first time. All stages are described for 23 of these species. The taxonomic characters used in the descriptions are analyzed and evaluated by considering both individual and ecological variations. Keys are provided for the identification of all known stages of these species.

5. Steffan, W. A. 1968. Armigeres of the Papuan Subregion (Diptera: Culicidae). J. Med. Ent. 5(2): 135-159.

The 6 species of the subgenus Armigeres from the Papuan Subregion, A. breinli (Taylor), A. denbesteni Brug, A. lacuum Edwards, A. malayi (Theobald), A. milnensis Lee and A. papuensis Peters are redescribed and keys to adults, male genitalia, pupae, and larvae of all species are provided. The pupa, larva, and male genitalia of each species are illustrated.

The Papuan Armigeres are divided into two groups, the malayi group and milnensis group, based on structure of the male genitalia, presence or absence of clypeal scales on the adult, and differences in larval chaetotaxy. The Papuan species appear to be closely related to the Indo-Malayan fauna although only one species, A. malayi, is also found in that area.

6. Steffan, W. A. 1968. Hawaiian Toxorhynchites (Diptera: Culicidae). Proc. Haw. Ent. Soc. 20(1): 141-155.

The three species of Toxorhynchites, T. amboinensis (Doleschall), T. brevipalpis Theobald and T. inornatus (Walker), which have been introduced into Hawaii for biological control of Aedes albopictus (Skuse) are redescribed, illustrated, and keys provided for the identification of all stages. The uncertain identity of T. amboinensis was clarified by comparison with topotypic material collected on Ambon Island for the Papuan study. T. amboinensis was colonized in the laboratory and a report of its biology is being prepared for publication.

7. Steffan, W. A. 1968. Mosquitoes of the Papuan Subregion (Diptera: Culicidae) Toxorhynchites (Toxorhynchites) amboinensis (Doleschall, 1857). J. Med. Ent. 5(3): 310-313.

The male and female of Toxorhynchites (Toxorhynchites) amboinensis (Doleschall) are redescribed from topotypic material from Ambon Island, Indonesia, and compared with the Philippine amboinensis introduced into Hawaii.

8. Steffan, W. A. Culex (Acallyntrum) of the Papuan Subregion (near completion).

The 5 known species and 3 new species of this endemic subgenus are redescribed and figured. The immature stages are largely restricted

to plant axils. All stages of 6 of the species are described and illustrated. The distribution, biology, and systematics of all species are discussed.