

SOME NOTES ON MOSQUITOES COLLECTED ON FREDERIK HENDRIK ISLAND (NETHERLANDS NEW GUINEA)

by

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The mosquitoes placed on record here were collected during a fortnight's trip to Frederik Hendrik Island from March 6th to 20th, 1958, well within the wet season.

Frederik Hendrik Island, which is about half the size of the Netherlands, lies to the southwest of the extensive lowlands of southern New Guinea; it is separated from the mainland by the two to three mile-wide Princess Marianne Straits. Surrounded by a narrow belt of wooded, higher grounds, the main part of the island is one immense swamp with a rather homogeneous vegetation of various swamp grasses, reeds, rushes, ferns, scattered *Pandanus* trees, and a variety of floating and submerged water weeds, including conspicuous species such as *Pistia stratiotes*, *Monochoria hastata*, *Hydrocharis* sp., *Utricularia* sp., a number of water lilies, water gentians, and floating water ferns such as *Azolla* sp. Small native villages, with every house and garden built on artificial mounds, lie scattered far apart in this inaccessible area; they were originally built as a relatively safe hiding place from head-hunting neighbours. An abundance of sago and coconut palms are found in the villages in the eastern part of the island. Canoes are the only means of communication.



Fig. 1. Native "anti-mosquito" house, Teri, Fred. Hendrik Island. At the left side of the house at ground level the small entrance, the only opening in this structure (Photo by S. L. van den Assem-Roest).

Mosquitoes were collected in three localities: Kimaan, a village on the higher ground in the eastern part, and in Jeobi and Teri-Kalwa, two inland villages in the

swamp. Frederik Hendrik Island is reputedly one of the worst mosquito-ridden areas of New Guinea.

In some inland villages (*e.g.*, Teri), native "anti-mosquito houses" still exist: dome-shaped constructions about ten feet high, made of dried grasses and rushes on a bamboo or wooden frame; they are entirely closed except for one small hole not exceeding 50×50 cm, at ground level (*Fig. 1*). A heavily smoking fire is kept going just before this opening. People lying inside manage to sleep under these conditions without being bitten by mosquitoes which, presumably, cannot stand the atmosphere. However, these houses with the importation of mosquito nets tend to go out of use nowadays.

COLLECTED SPECIES

The species collected are recorded in alphabetical order.

1. *Aedes (Aedes) ? funereus* (Theo.). Adults biting in sheltered places on higher grounds in daytime, some indoors at night (Kimaan).

2. *Aedes (F.) kochi* (Dönitz). Adults fairly common, biting indoors (Kimaan); larvae were found in leaf axils of sago palms (Jeobi).

3. *Aedes (F.) wallacei* (Edw.). Adults caught biting indoors (Kimaan, Jeobi, Teri). In Jeobi, the density of this mosquito reached astronomical numbers. A solid cloud of the species appeared just after sunset; they fed on uncovered portions of the skin in such numbers that to all intents and purposes there was no vacant space at any one time for an additional mosquito. Repellents were of little use.

Aedes wallacei also is axil breeder; however, no larvae were found at Jeobi. The only axils available in sufficient numbers in this area are those of the sago palm (*Metroxylon spec.*).

4. *Aedes (Finlaya) spec. nov.* This new species was discovered by Dr. E. N. MARKS (Brisbane) among the *wallacei* material from Jeobi and Teri. The species will be described by her in due course.

5. *Aedomyia catasticta* (Knab). Larvae occurred in dense masses of floating and submerged waterweeds, including *Pistia*, *Hydrocharis*, *Utricularia* and *Azolla* (Teri).

6. *Anopheles bancrofti bancrofti* (Giles). Many blood-fed females were collected indoors from the walls of native huts. They seem to spend the day following feeding indoors and leave the next evening or night, for no specimens were collected with ova developed beyond stage III (*i.e.*, halfway the gonotrophic cycle which under local conditions lasts for 2×24 hours). Larvae were collected among vegetation fringing permanent water collections (eri).

7. *Anopheles farauti* (Lav.). Only collected in small numbers on the higher grounds at Kimaan. In the swamp area there hardly seems to exist suitable breeding places for this species which is an important vector of malaria throughout New Guinea.

8. *Culex (C.) annulirostris* (Skuse). Larvae collected from temporary pools, and adults biting at night at Kimaan; a common species.

9. *Culex (C.) bitaeniorhynchus* (Giles). Larvae collected from earth-lined ditches, a few adults biting at night at Kimaan. The collected specimens were conspicuously dark. Occiput covered with black curved scales; mesonotum almost entirely covered with blackishbrown curved scales, hardly any lighter ones intermixed; there is no difference between the colouration of scales in the posterior and anterior parts of the

mesonotum; the posterior abdominal segments bear brownish-yellow scales in apical bands.

10. *Culex (Culi.) pullus* (Theo.). Larvae abundantly present in polluted water collections (decaying leaves of sago palm, and pools with decaying vegetable material) in Kimaan. The anal gills of the larvae were markedly elongated, about twice the length of the anal fan.

11. *Culex (Culiciomyia) spec.* A few larvae collected among the *Culex pullus* larvae at Kimaan probably belonged to a still undescribed species; it is certainly different from the species quoted by KING & HOOGSTRAAL (1946).

Larva. Head distinctly wider than long. Clypeal spines slender, dark. Head hairs distinctly frayed, implanted on about a straight line, B and C close together; A up to 12 branches; B 5-branched; C 7-branched; hair B slightly longer than the others. Antenna with spicules in the basal half or beyond; antennal hair beyond middle of shaft, multibranched and frayed. Lateral comb on 8th abdominal segment more or less irregularly arranged in a patch comprising many frayed teeth. Siphon slightly inflated, broadest part about in the middle, distinctly tapering towards apex, siphonal index 3. Pecten comprises seven multidentate teeth confined to about the basal third of siphon. Four 2-6-branched siphonal hairs present. Anal segment about as long as wide. Dorsal subcaudal with three branches; ventral subcaudal single; anal fan many-branched; anal gills large and pointed towards apex (Fig. 2)

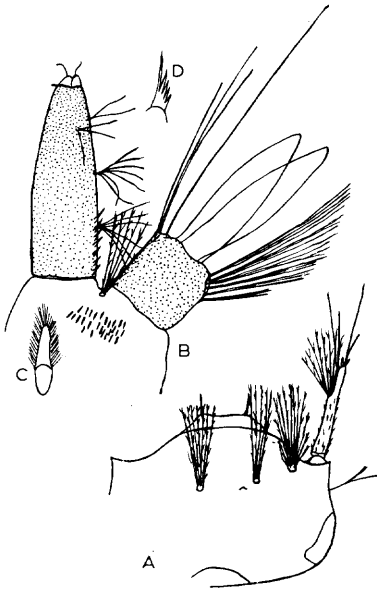


Fig. 2. *Culex (Culiciomyia) spec.* A. Head of larva; B. Terminal segments of larva; C. Comb tooth, enlarged; D. Pecten spine, enlarged.

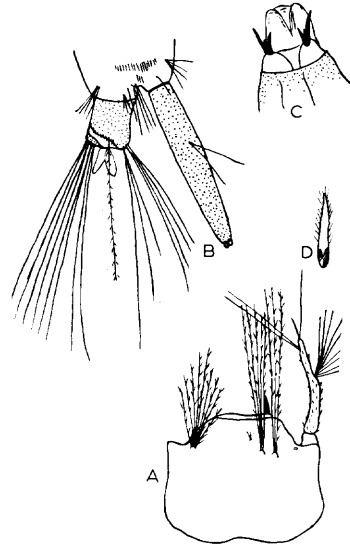


Fig. 3. *Ficalbia elegans*. A. Head of larva; B. Terminal segments of larva; C. Apex of siphon, enlarged; D. Comb tooth, enlarged.

12. *Culex (Loph.) fraudatrix* (Theo.). A pupa from which an adult female was bred was collected among waterweeds fringing permanent water at Kimaan. This specimen is probably *fraudatrix*; it cannot definitely be identified for lack of male specimens.

13. *Ficalbia (M.) elegans* (Taylor). Larvae were taken from a small water collection, heavily polluted by decaying vegetable matter and waste from a pigsty (Kimaan). As neither the larvae nor the adults bred from them quite match TAYLOR'S description (as quoted by BONNE-WEPSTER, 1954),* a few notes are added; see also Fig. 3.

The adults have no prominent orange band in the apical part of the proboscis; the pale scales on the proboscis are not creamy-white by yellow-ochre. The ornamentation on the mesonotum by narrow golden scales is more or less triangular, the base at about the level of the wing roots. The conspicuous reflection of shining violet scales in the legs is absent (also in fresh specimens), the legs are bronze coloured. There is no marked reflection on the dorsum of the abdomen, the tergites are clothed with bronze coloured scales, the light coloured spots on second, third, and fourth segments are missing; there is only one fairly large medial spot in segment 1, (occasionally a small spot present on segment 2).

Differences in the larvae are found: (1) in the head hairs A (9-11 branched), B (3 branches) and C (5 branches); (2) in the teeth on the 8th abdominal segment which are arranged in two rows (16-17 and 3 teeth); (3) in the siphonal and anal tufts which have bare branches.

14. *Ficalbia (M.) metallica* (Leic.). Larvae and pupae taken from the same breeding place as *F. minima* (Teri) and from ditches heavily grown with *Monochoria hastata* (Kimaan). Typical *metallica* specimens were bred from pupae.

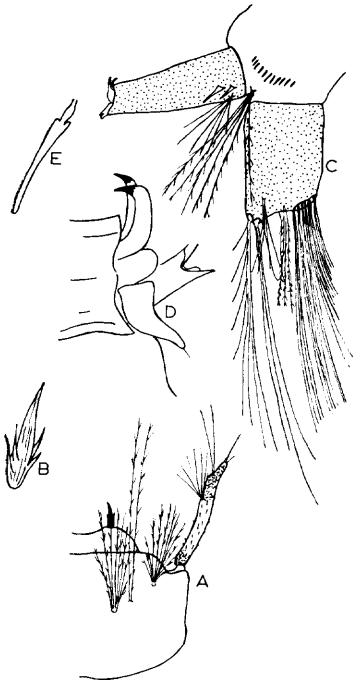


Fig. 4. *Ficalbia minima*. A. Head of larva; B. Clypeal spine, enlarged; C. Terminal segments of larva; D. Apex of siphon, enlarged; E. Comb tooth, enlarged.

* The specimens agree however with MATTINGLY'S description of the species which came at hand later on (MATTINGLY, 1957).

15. *Ficalbia minima* (Theo.). Larvae collected from dense *Pistia* masses at Teri. The finding of this oriental species in this southern locality is interesting; the species is probably widespread in New Guinea as identical larvae were recently collected from Lake Sentani (Hollandia area) (Fig. 4).

16. *Hodgesia spoliata* (Edw.). A single female biting at Kimaan; the species has not yet been recorded from this territory.

17. *Mansonia (M.) bonnewepsterae* (v. d. Assem). Few specimens biting at night (Teri). Since no male specimens could be taken the identification is not quite certain.

18. *Mansonia (C.) ochracea* (Theo.). A single female biting indoors at night in Kimaan.

19. *Mansonia (M.) papuensis* (Taylor). A common biter in Kimaan and Teri. The species is common, especially in South New Guinea localities, in contradiction to BONNE-WEPSTER'S statement (1954). The larva of this species is still unknown; it could not be traced, although adults were abundant.

20. *Mansonia (M.) uniformis* (Theo.). By far the dominant biter in Kimaan, very common in other localities. Large numbers were collected biting indoors at night. The species bites in daytime as well, especially in shaded, humid places. Host-plants for the rootpiercing larvae were plentiful; larvae were collected from *Pistia* roots at Teri from a typical breeding place; the water was heavily polluted by decaying coconut husks.

21. *Mansonia (C.) xanthogaster* (Edw.). Common biter at night in Kimaan. As no males were collected, the species cannot positively be identified; however, females collected in other coastal localities in South New Guinea (Merauke, Koembe) were correlated with *xanthogaster* males.

22. *Tripteroides (Tr.) quasiornata* (Taylor). A single female biting in daytime was collected at Teri; it is most probably this species, although it was not in the best condition for identification.

23. *Uranotaenia albescens* (Taylor). Larvae collected between the vegetation on the fringe of permanent water in Kimaan and Teri, associated with *Anopheles bancrofti* larvae.

24. *Uranotaenia papua* (Brug). Larvae collected from the same breeding place as *F. elegans*.

25. In addition, specimens of *Anopheles amictus hilli*, collected by a medical officer on tour in the island, were identified by the author.

The list certainly does not represent the complete local mosquito fauna. Also important quantitative changes will occur in the dry season, as was observed in all-season observations in the Merauke district, some 120 miles east of Frederik Hendrik Island. However, it gives an idea of the mosquito spectrum in the wet season.

Some interesting facts were derived from the collections. At the time of collecting, three distinctly dominant, man-biting species were present: *Aedes wallacei*, *Anopheles bancrofti* and *Mansonia uniformis*. Each of these species inhabits a different habitat during larval life; in the swamp area their habitats are probably the only ones able to support the abundance of individuals recorded in the present survey.

A. wallacei is taken exclusively from leaf axils (*Pandanus* axils, according to TAYLOR (1934)); however, it is doubtful whether the relatively few *Pandanus* trees present could produce the numbers found. Although *A. kochi* larvae were discovered in sago axils, the latter must be assumed to harbour *A. wallacei* as well.