# A New Mosquito from Fiji, *Aëdes (Finlaya) freycinetiae* n. sp. (Diptera: Culicidae)

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UNTIL Marks (1947) described *Aëdes* (*Finlaya*) *fijiensis* from Viti Levu, it had been generally accepted that the representative of the widespread *kochi* group occurring there was *A. kochi* (Dönitz) itself. The easternmost limit of the latter species is now placed at, or at all events near, Nissan Island, Territory of New Guinea (Marks, 1947). The only indication that *A. fijiensis* may not be the sole member of its subgenus occurring in Fiji is Marks' (1947) brief account of a single distinctive larva—which she queried as perhaps referable to *A. samoanus* (Grünberg)—collected from *Pandanus* axils in association with *A. fijiensis*. There are no records of the latter species from outside of Fiji, but *A. samoanus* is found in Tonga as well as Samoa (Edwards, 1926) and Iyengar (1955) has recently listed it from the Wallis Islands. These two mosquitoes are the most easterly representatives of their subgenus thus far described from the South Pacific.

Paine (1943) considered leaf axils of the common coastal *Pandanus tectorius* (Sol.) to be the usual larval habitat of *A. fijiensis* (= *A. kochi* in part). He also reported this insect from the smaller *Pandanus thurstonii* Wright, and, less frequently still, from the large aroid *Alocasia indica*. Neither Amos (1947) nor Marks (1947) listed any additional larval habitats, Marks (presumably following Paine in Edwards, 1935) mistakenly referring *A. indica* to the genus *Colocasia*.

Whilst *A. fijiensis* is primarily associated with *Pandanus*, the larvae of *A. samoanus* occur most commonly in the leaf axils of *Alocasia* and *Colocasia* (Buxton and Hopkins, 1927). The latter authors never found *A. samoanus* larvae in axils of *Pandanus*, wild *Canna*, and pineapples as did O'Connor (1923); neither did they ever collect them from tree holes or other small simple containers. However, Knight (in Bohart and Ingram, 1946) recorded *A. samoanus* from *Pandanus* in Samoa, and Laird (1956) took a few larvae from the axils of a large *Pandanus* in Tonga and a few others from a small tree hole (a step in a coconut palm trunk) near Apia, Samoa.

*Finlaya* larvae were collected from *Freycinetia* leaf axils, a new habitat for mosquitoes of this subgenus (c.f. Knight and Marks, 1952), during field studies in Fiji early in 1954 (Laird, 1956). The species concerned proved to belong to the *kochi* group, coming closest to *A. samoanus* but differing in detail from this insect, *A. fijiensis*, and other members of the group as described herein.

ACKNOWLEDGMENTS

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MATERIAL

Four larval collections of *Aëdes freycinetiae* n. sp. were made, all of them from a forest climbing plant belonging to the family Pandanaceae, *Freycinetia milnei* Seem. The first location was at an altitude of 125 m. near the Glen Pool, Suva (March 1, 1954), and the other three were at varying altitudes near 1,000 m. in the vicinity of Nandarivatu, northern Viti Levu (March 8 and 9). Larvae were rare in all cases, no more than three ever being taken from a single axil. Collections from 122 successive axils (Glen Pool) produced an average of only 0.12 larvae per axil (av. water content, 1.23 cc.). Ecological data concerning the larval habitat have already been published (Laird, 1956).

Fourth instar larvae brought back to the laboratory did not pupate for up to eight days, and the duration of the pupal stage ranged from 45 to 50 hours. A small series of males and females was obtained. There was no opportunity to describe them at the time, as the laboratory equipment was being crated preparatory to our departure from Fiji, which took place a few weeks after these collections were made. Most unfortunately, an accident en route to New Zealand resulted in the total destruction of the pinned specimens. However, the larval slides and two alcohol-preserved adults, a male and a female, survived. It is not practicable to attempt a full description of the adults from the balsam mounts prepared from these specimens, details of colouring and scaling having been obscured in varying degree. A complete account of this insect must await further collections, but the male genitalia and the larvae are sufficiently distinctive to warrant the description of a new species at this stage.

*Aëdes* (*Finlaya*) *freycinetiae* n. sp.

TYPES: Holotype male, allotype female, and seven morphotype larvae, Glen Pool, Suva, March 1, 1954.

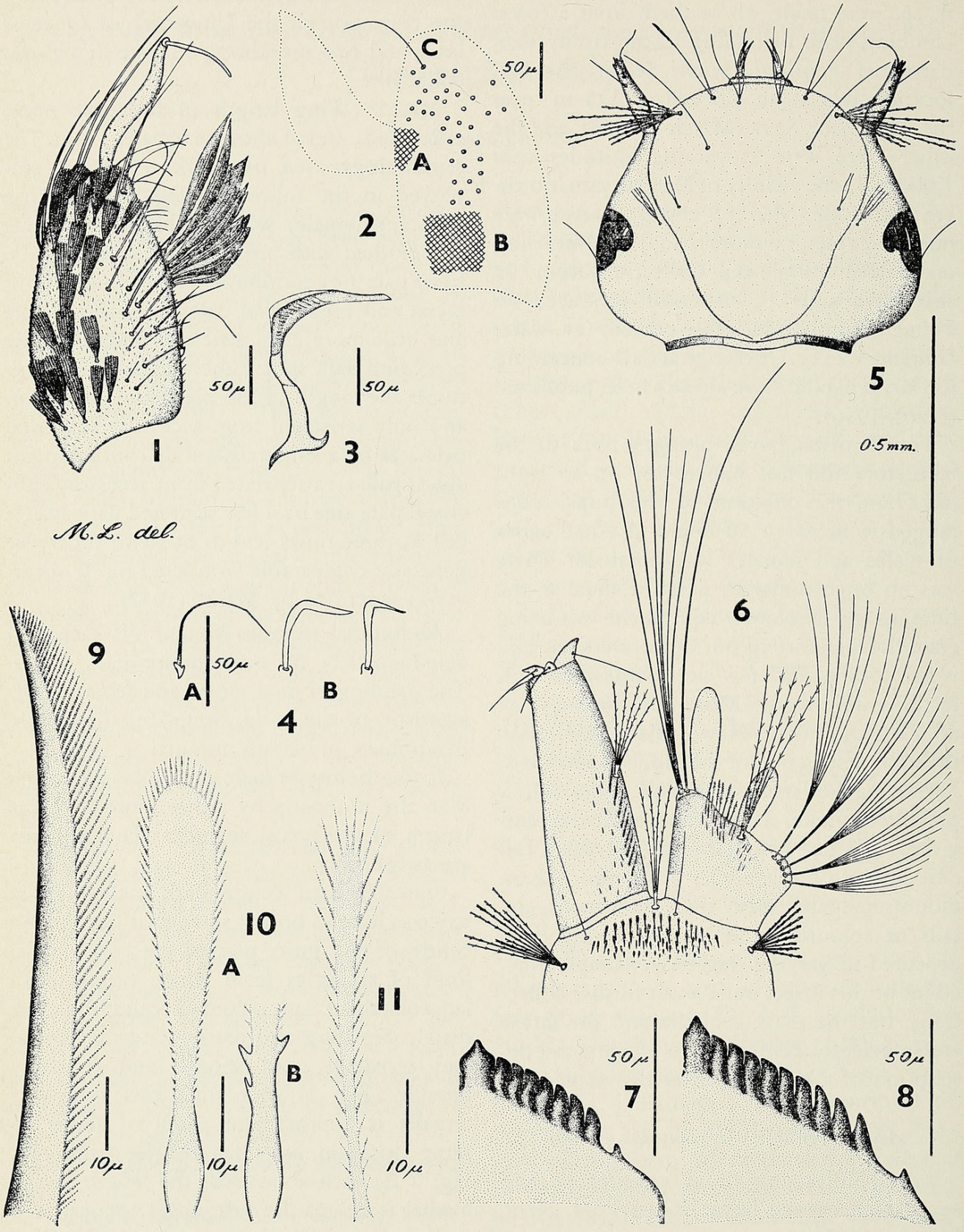
LOCATION OF TYPE MATERIAL: Holotype male, allotype female and two morphotype larvae in the collection of the Dominion Museum, Wellington; three morphotype larvae in the collection of the University of Queensland; and two morphotype larvae in my own collection.

ADULT: Wing length of holotype male, c. 2.5 mm., and of allotype female, 3 mm. The terminology used by Marks (1947) is employed in the following description. Wing (allotype female) with extensive clear areas and clothed with broad scales; *C* having the basal pale area continuous with confluent humeral and prehumeral pale areas; sector pale area little more than half the length of the preceding dark spot; subcostal pale area two-thirds the length of the preceding dark spot, and only separated from accessory subcostal pale area by a single dark scale (both wings); apical pale area separated from accessory subcostal pale area by a few scattered dark scales; cell $R_2$ three times length of stem; otherwise generally comparable with wing of *A. samoanus* as described by Marks (1947).

Abdominal sternites VI and VII each bordered apically by outstanding dark scales. The banding of tarsi, tibiae and femora characteristic of the *kochi* group, but details indeterminate in balsam mounts.

In the holotype male the palps are longer than the proboscis by rather more than the length of the apical segment. The genitalia are as follows:

Outer face of coxite dark scaled, about twice as long as broad; somewhat beyond the centre of the inner margin are two parallel lines of tubercles from which originate 14 lanceolate and dark coloured scales, the most distal ones long and narrow and the medial and proximal ones shorter and relatively broader (Fig. 1); bordering this scale tuft tergally is a prominent patch of about 25 setae (location indicated diagramatically in Fig. 2 A) each about half the length of the medial scales of the tuft; there are scattered curved or apically bent setae distally (Fig. 2 C), and there is a prominent patch of 75–80

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medially directed setae of this type (location indicated diagramatically in Fig. 2 B); an irregular double row of elongate straight or slightly curved setae extends down the sternal face of the coxite, whilst on the inner sternal edge, and at about one-quarter of the length of the coxite from its base, a bent, slender and inconspicuous specialized seta arises from a prominent tubercle (Figs. 1, 4 A); no subterminal setae are borne by the curved and slender style, which is about twice the length of its terminal appendage (Fig. 1); the appendage of the harpago is sharply pointed and broadly triangular (Fig. 3), and the paraproct has a single tooth.

LARVA: Very pale, the head and siphon lightly chitinized and the thorax and abdomen bearing stellate setae. Antenna nonspiculate, the tuft a single simple seta of rather more than half the length of the antenna and inserted at about the apical one-third; a long and sinuous subterminal seta ventrally (Fig. 5). Clypeal spine double. Head seta A stellate, posterior to B and d, and having from 9 to 13 frayed branches with forked tips, the longest branch being half as long again as the antenna; d and B two- or three-branched and simple, d rather shorter than B which exceeds the antenna in length; B originating in front of d, and these two setae a little closer to one another than B is to A; C an elongate simple seta originating behind the level of the base of the antenna and more or less in line with B; e with two branches and f three- or four-branched, the branches of these setae being simple and about as long as the clypeal spines (Fig. 5). Mentum (Fig. 7) with a stout medial tooth and eight smaller lateral teeth, the most basal of which is minute and widely separated from its nearest neighbour.

Abdominal segments I to VI each bearing a pair of long and plumose lateral setae, those of segment I being 8- to 10-branched, those of II 7- to 9-branched and those of III to VI 2-branched.

The lateral comb is a broadly triangular patch of from 70 to 80 scales in four irregular rows (Fig. 6), those of the distal row numbering from 14 to 16 and measuring some 65$\mu$ in length; these scales (Fig. 10, A), which are spatulate and fringed both laterally and apically, altogether lack lateral spines; the scales of the other rows are similar but shorter; two or three uneven lines of minute setae are located in front of the proximal row (Fig. 6).

The first and fifth pentad hairs are stellate, the frayed branches ranging from 8 to 12 in number and having forked tips; both the second and fourth pentad hairs are single and simple, while the third is four-branched and plumose (Fig. 6). The siphonal index is about 2.5 to 3.0, the siphon itself being bare except for sparse spicules basally and bordering the pecten, and an apico-dorsal patch (Fig. 6). There are from 8 to 11 pecten spines, the

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EXPLANATION OF THE PLATE

(All figures prepared by means of a Zeiss-Winkel drawing apparatus.)

FIG. 1. Outer aspect of male coxite, *A. freycinetiae*.

FIG. 2. Inner aspect of male coxite, *A. freycinetiae* (diagrammatic). A, location of patch of setae tergal to scale tuft. B, location of basal patch of setae. C, an apically bent seta.

FIG. 3. Harpago, *A. freycinetiae*.

FIG. 4. A, specialized seta of male coxite of *A. freycinetiae*. B, specialized setae of male coxite of *A. samoanus* (after Stone and Bohart, 1944).

FIG. 5. Larval head, *A. freycinetiae*.

FIG. 6. Terminal segments of abdomen, larva of *A. freycinetiae*.

FIG. 7. Mentum (teeth of one side only), larva of *A. freycinetiae*.

FIG. 8. Mentum (teeth of one side only), larva of *A. samoanus*.

FIG. 9. Pecten spine, larva of *A. freycinetiae*.

FIG. 10. A, scale of distal row of lateral comb, larva of *A. freycinetiae*. B, base of scale of distal row of lateral comb, larva of *A. samoanus*.

FIG. 11. Apical scale of anal segment, larva of *A. freycinetiae*.

distal three of which are rather more widely spaced than the others; these spines (Fig. 9) are finely fringed along the proximal edge and range from 80 μ to 95 μ in length. The subventral tuft has five plumose branches, and originates just beyond the middle of the siphon.

A lightly chitinized saddle covers the dorsal two-thirds of the anal segment; it is not pilose, but bears numerous fringed scales distally (Fig. 6); the apical scales (Fig. 11) are the longest, ranging up to 75 μ in length. The plumose lateral seta is four- or five-branched, the ventral brush consists of two parallel rows of five tufts each having six branches, and the caudal setae—the upper of which has six branches while the lower is single—are simple. Dorsal pair of anal papillae longer than ventral, ranging from little more than the length of the saddle to twice the length of the latter.

## SYSTEMATIC POSITION

The spotted wings clothed with broad scales, the outstanding apical scales of abdominal sternites VI and VII, the banding of the legs, and the leaf axil habitat and stellate setae of the larvae all refer this *Finlaya* to the *kochi* group as defined by Marks (1947).

As previously stated, two representatives of this group are already known from Fiji and western Polynesia. These are easily differentiated from one another in both larval and adult states. The pale scales of the mesonotum are frosty white in *A. fijiensis* (as in *A. kochi* itself) and creamy to ochreous in *A. samoanus*; the male genitalia differ in several respects, the specialized seta of the coxite being broadly expanded medially in the former species and uniformly narrow in the latter one, the preapical tuft of the coxite consisting of 5 to 7 long and very narrow scales in *A. fijiensis* but of 10 to 12 long and broad scales in *A. samoanus*, and the style bearing subterminal setae in *A. fijiensis* alone; the larval siphon is pilose in the latter species (Marks, 1947) but bare, or only slightly pilose, in *A. samoanus* (Bohart and Ingram, 1946). In both insects the lateral comb scales have from two to four short lateral spines near the base (Fig. 10, B, *A. samoanus*).

The lack of any medial or other expansion of the threadlike specialized seta, the presence of 14 narrow and broad scales instead of only 5 to 7 narrow ones in the preapical tuft of the coxite, the absence of subterminal setae from the style, the presence of but few scattered spicules on the siphon and the complete absence of lateral spines from the comb scales, all combine to differentiate the *Finlaya* of *Freycinetia* axils from *A. fijiensis*. However, while the present species is at once distinguishable from *A. samoanus* by the absence of basal spines from the lateral comb scales, these two mosquitoes otherwise have much in common, and a closer comparison of their similarities and differences is indicated.

For the reasons already given, a full comparison of the adults cannot be made at present. The wing length of the females is similar, being 3.0 mm. in *A. freycinetiae* n. sp. and 3.0 mm. (Bohart and Ingram, 1946) to 3.2 mm. (Marks, 1947) in *A. samoanus* (that of *A. fijiensis* ranges from 2.7 mm. to 2.9 mm. according to Marks). There are, however, differences in venation. While Marks described the sector pale area of *C* as long in *A. samoanus*, this area is little more than half the length of the preceding dark spot in *A. freycinetiae* n. sp. The subcostal pale area of *C* is equal to or almost twice as long as the preceding dark spot in *A. samoanus*, but is only two-thirds the length of this spot in the present species; while the latter has cell $R_2$ three times the length of its stem, this cell varying from two to two-and-a-half times the length of its stem in *A. samoanus*.

Bohart and Ingram (1946) described the male palpi of *A. samoanus* as being about as long as the proboscis. These structures (which are slightly longer than the proboscis in *A. fijiensis*) exceed the proboscis by rather more than the length of the apical segment in *A.*

*freycinetiae* n. sp. There are significant differences between the male genitalia of the two mosquitoes. The preapical tuft of the coxite of *A. samoanus* is entirely composed of broad scales according to the data of Edwards (1935) and the figure of Bohart and Ingram (1946), but in *A. freycinetiae* n. sp. the distal scales are relatively much narrower in proportion to their length than the medial and proximal ones. Edwards (1935) gave the number of scales in the tuft of the former insect as 10 to 12, and Bohart and Ingram figured an example having 10, while the holotype ♂ of the latter species has 14. Although Edwards (1935) declared that the patch of setae tergal to the preapical tuft is scarcely indicated in *A. samoanus* by comparison with *A. fijiensis* (= Fijian *A. kochi*), this patch is equally prominent in the latter insect and *A. freycinetiae* n. sp. Considerable importance has been attached to the specialized seta in the classification of the *kochi* group. This seta is merely an apically bent hair hardly deserving the qualification of "specialized" in the Fijian insect under discussion; but although the specialized seta of *A. samoanus* was referred to as "very much shorter (than that of *A. fijiensis* . . . M. L.) and quite inconspicuous" by Edwards (1935), it was figured as a relatively broad structure by Stone and Bohart (1944; c.f. Fig. 4 B, herein) and Bohart and Ingram (1946).

Larval *A. samoanus* and *A. freycinetiae* n. sp. resemble one another but differ from *A. fijiensis* in the presence of but few scattered spicules on the siphon. Both the first-named species have a few spicules basally and laterally near the pecten, and also a prominent little apicodorsal line (neither referred to by previous authors who have discussed *A. samoanus* nor figured by Buxton and Hopkins, 1927, or Bohart and Ingram, 1946, but apparent in my material from Samoa and Tonga). Head hairs A, B and d arise in a curved line forwards in the case of *A. samoanus*, as was pointed out by Buxton and Hopkins (1927); this holds good in my Samoan and Tongan larvae, but in *A. freycinetiae* n. sp. d originates posterior to B (Fig. 5) as is the case in *A. fijiensis*. The general arrangement of the setae is otherwise much alike in the two species, although branching is more marked in *A. freycinetiae* n. sp.

The number, spacing, and shape of the pecten spines are comparable in *A. samoanus* and *A. freycinetiae* n. sp. It would seem from the literature that the former species has fewer comb scales ("perhaps fifty" according to Buxton and Hopkins, and "about 70" according to Bohart and Ingram) than the latter (70–80). Nevertheless, there are approximately 80 scales in the lateral comb of our *A. samoanus* larvae from Samoa and Tonga. However, the two insects are immediately separable

| *Seta* | *A. freycinetiae* n. sp. | *A. samoanus* |
|---|---|---|
| Head | | |
| Seta A | 9–13 branches | 4– 6 branches |
| Seta B | 2– 3 branches | 2– 3 branches |
| Seta C | Single | Single |
| Seta d | 2– 3 branches | 2– 4 branches |
| Seta e | 2 branches | 1– 2 branches |
| Seta f | 3– 4 branches | 2– 3 branches |
| Terminal segments | | |
| 1st pentad seta | 8–12 branches | 6–10 branches |
| 2nd pentad seta | Single | Single |
| 3rd pentad seta | 4 branches | 2– 3 branches |
| 4th pentad seta | Single | Single |
| 5th pentad seta | 8–12 branches | 6–10 branches |
| Siphonal subventral tuft | 5 branches (all examples seen) | 3–(rarely) 4 branches |
| Lateral seta of saddle | 4– 5 branches | 3– 4 branches |

from one another by the shape of the comb scales of the distal row. In both cases these scales are long, spatulate and apically and laterally fringed (previous authors have described those of *A. samoanus* as apically fringed only, although the Samoan and Tongan specimens before me exhibit an extremely fine lateral fringe best seen by phase contrast illumination), but the prominent baso-lateral teeth of *A. samoanus* (Fig. 10, B) are altogether lacking in the Fijian insect in which the lateral fringe continues to the base (Fig. 10 A).

A final well-marked point of difference between the larvae of the two species is to be seen in the mentum. That of *A. samoanus* has from 19 to 21 teeth (Bohart and Ingram, 1946), all my Samoan and Tongan specimens being within this range and most of them exhibiting 10 teeth, the most basal one widely separated from the next, on each side of a larger, bullet-shaped medial tooth (Fig. 8). In every larva of *A. freycinetiae* n. sp. thus far examined, on the other hand, the mentum has only 17 teeth the medial one of which is relatively broader and squatter than is that of *A. samoanus* (Fig. 7).

It is considered that the morphological differences between the *Finlaya* of Fijian *Freycinetia* axils, and its closest relatives, are such as to require its description as new, and this insect is accordingly designated *Aëdes* (*Finlaya*) *freycinetiae* n. sp.

## RELATIONSHIPS

The hairlike specialized seta of the coxite of the male of *A. freycinetiae* is quite distinct from that of *A. kochi*, *A. bougainvillensis* Marks, *A. fijiensis*, *A. wallacei* Edwards and *A. solomonis* Stone and Bohart, in all of which the apical portion is to some extent expanded. *A. samoanus* is the only other known member of the *kochi* group in which a specialized seta is present, and the form of the seta, together with other features of adult and larval morphology, indicates a close relationship between this species and *A. freycinetiae*. It is worth noting that *A. knighti* Stone and Bohart (Solomon Is.) is the only South Pacific member of the *kochi* group lacking a specialized seta altogether. None of the Oriental members of the group have such a seta (Knight and Laffoon, 1946). *A. knighti* is only known from three males from the New Georgia group, and although differing from *A. freycinetiae* in that the style is slightly inflated medially it resembles the latter insect in the absence of subterminal setae from this structure. From figure 7 of Stone and Bohart (1944) it would appear that the distal scales of the preapical tuft of the coxite are narrower than the medial ones as in *A. freycinetiae*. Further comparisons of the latter insect with *A. knighti* would be of decided interest.

The most striking single feature separating *A. freycinetiae* from *A. samoanus* is a larval one, the absence of baso-lateral spines from the lateral comb scales of the distal row. Marks (1947) and other authors have attached considerable significance to the shape of these scales in differentiating between species of the *kochi* group. In *A. kochi* itself and several other species of the group the distal comb teeth are pointed spines, not apically fringed scales, and Marks (1947) showed that, starting with the last-named insect "in New Guinea with the comb tooth having a stout, pointed medial spine and short lateral spines, as one passes eastwards the medial spine becomes longer and more slender, develops a flattened lateral flange, the thicker medial portion then becomes reduced, and finally the apex becomes rounded and fringed; the lateral spines persist throughout. Coming south from New Guinea, the medial spine remains stout and unflattened but the lateral spines are lost . . ." The Fijian *A. freycinetiae*, a species having spatulate and fringed comb scales, lacks any baso-lateral spines, just as do the two Australian species characterised by pointed comb spines, *A. alocasicola* Marks and *A. gahnicola* Marks.

One may question whether these baso-lateral spines have really been "lost" at all in the three species just referred to. From the

figures presented by Marks (1947) it appears that in all members of the *kochi* group, those having pointed comb spines distally as well as those having fringed scales only, the proximal rows of the comb consist exclusively of apically and laterally fringed scales. As, moreover, the pointed condition is least evident in the early instars, it may be postulated that the development of pointed spines in the distal row is a later development than that of fringed scales. Support for this hypothesis is to be derived from a wider study of the tribe Culicini. Some of the more "primitive" members of this tribe (e.g., *Toxorhynchites*, *Trichoprosopon*) lack a lateral comb altogether, others (e.g., *Harpagomyia*, *Theobaldia*) have a comb composed wholly of fringed scales, and for that matter the least specialized subgenera of individual genera often exhibit only fringed scales (e.g., *Maorigoeldia* of *Tripteroides*, *Mucidus* of *Aëdes*) although the comb of their more advanced relatives may consist partly or wholly of pointed spines. Again, in the subgenus *Culex*, generalized species such as *C. annulirostris* Skuse and *C. tritaeniorhynchus* Giles breed in a wide range of surface waters and their larvae have large numbers of small, fringed scales in the lateral comb; species which have clearly diverged from the generalized ancestral stock, on the other hand—for example *C. bitaeniorhynchus* Giles and *C. squamosus* Taylor, the larvae of which are to be found in association with green filamentous algae, and *C. basicinctus* Edwards, having larvae specialized for life amongst algae in flowing streams—have the lateral comb made up of relatively small numbers of pointed spines.

Accepting that the development of pointed spines in the distal row of comb teeth of members of the *kochi* group represents the specialization of a more generalized type of comb tooth, the fringed scale—and Marks (1947) noted that a larva of *A. kochi* itself from Nissan Island, at the eastern periphery of the range of this species, had one of the distal comb teeth apically fringed—there are good grounds for postulating that the development of baso-lateral spines on both types of teeth is likewise a specialization. Marks (1947) drew attention to the fact that the Philippine *A. flavipennis* (Giles) (which of all members of the *kochi* group exhibits least development of the larval specializations which characterize these insects) has only short scales with a rounded tip and a fine apical and lateral fringe in the distal row of the lateral comb. This may be viewed as being in accord with the general tendency for the more primitive representatives of the various animal groups to be found towards the periphery of the zone of dispersal, as may the distribution of the more southerly species of the *kochi* group lacking baso-lateral spines on the comb teeth, *A. alocasicola*, *A. gahnicola*, and *A. freycinetiae*.

The morphology of the last-named species, particularly the primitive type of fringed scale in the distal row of the larval lateral comb and the slender and scarcely specialized seta of the male coxite, suggests that this insect might be close to the parent stock from which both of its nearest relatives, *A. samoanus* and *A. fijiensis*, have evolved. This hypothesis gains weight from the fact that the larval habitat of *A. freycinetiae* is an indigenous forest plant in the axils of which the parent stock could well have persisted in ecological isolation long after an evolving sympatric species had invaded various large species of *Pandanus*. Species of *Freycinetia* and *Pandanus* form part of the indigenous Fijian flora, and ample time has thus been available for the development of the various morphological differences which at once separate *A. fijiensis* from *A. freycinetiae;* but much less time can have operated in the case of the closest relative of the latter species, *A. samoanus*, which customarily breeds in the axils of *Colocasia* and *Alocasia* spp., plants owing their distribution throughout the South Pacific to human agency.

Buxton and Hopkins (1927) found it "not easy to understand why the typical *A. kochi*, breeding in coco-nuts, should give rise to

this race (*A. samoanus* . . . M. L.) breeding so exclusively in the axils of taro, for coconut shells, and many other small dark hollows, are abundant in Samoa and Tonga." These authors also found it difficult to account for the limited distribution of *A. samoanus* in Polynesia. Their puzzlement disappears in the light of the information now available. In the first place, Buxton and Hopkins based their belief that *A. kochi* breeds in husks on a record from New Britain by Hill (1925, also in Edwards, 1926). More recent investigators have altogether failed to corroborate this, and Laird (1946) found *kochi* larvae only in *Colocasia* axils and in one *Pandanus* axil in New Britain. The larval habitats listed for this species by Marks (1947) and Knight and Marks (1952) were *Colocasia*, *Alocasia*, *Pandanus*, *Crinum*, bananas and pineapples; and various plants belonging to the families Araceae and Pandanaceae comprise the usual habitats of members of the *kochi* group in general. The second point considered anomalous by Buxton and Hopkins, the limited distribution of *A. samoanus* in Polynesia, ceases to be surprising when we can view this insect not as an ecologically and geographically isolated subspecies of *A. kochi* but as a sibling species, evolved in the South Pacific, which may have yet to attain its maximum limits of dispersal.

## CONCLUSIONS

*A. freycinetiae* is regarded as close to the parent stock whence sprang *A. fijiensis* and *A. samoanus*, the last-named insect being much its closest relative. It remains to be established whether *A. samoanus* itself exists in Fiji. Despite the fact that great numbers of collections from various aroids, made over a considerable period of time, have not revealed its presence there, it is quite feasible that a race utilizing some other plant—perhaps a member of the Pandanaceae—as a larval habitat is yet to be discovered. This is all the more likely in view of the occasional occurrence of *A. samoanus* larvae in *Pandanus* axils in Samoa and Tonga and of Lever's discovery of a single distinctive larva associated with *A. fijiensis* in *Pandanus*. Marks (1947) gave a brief description of this larva, which, differing as it does from *A. fijiensis* in having a non-pilose siphon, and from *A. freycinetiae* in having distal comb teeth similar to those of the former species, is very likely referable to *A. samoanus*, as she suggested.

A careful investigation of the axils of *Freycinetia* spp. and other forest Pandanaceae in Samoa and elsewhere in the South Pacific, notably in the New Hebrides and New Caledonia whence no representatives of the *kochi* group are known, might well shed still further light upon our knowledge of these mosquitoes.

Observations on the biting habits of *A. freycinetiae* have yet to be made. Information concerning the behaviour of this insect is particularly desirable in view of the announcement by Symes (1955) that 68 (21.6 per cent) of 314 *A. fijiensis* females caught in houses and forest in Fiji (localities not stated) exhibited filarial infection (chiefly *Wuchereria bancrofti*). Symes' mosquito identifications having been made in the belief that but one species of the *kochi* group is to be found in Fiji, the occurrence there of a second species and perhaps a third one as well obviously has important bearing on his conclusions.

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