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THE VECTOR OF FILARIASIS IN POLYNESIA : A CHANGE IN NOMENCLATURE

BY

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Theobald (1910) described the mosquito *Aedes* (*Stegomyia*) *pseudoscutellaris* from three females from Suva, Fiji. It belongs to what is now called the *scutellaris* group or sub-group, a complex of closely related and very similar mosquitoes represented by many isolated island forms. The group is widespread in the Pacific area, within the tropics, and extends into the eastern part of the Oriental region. Stone and Farner (1945) summarize the distribution, and Knight and Hurlbut (1949) give the most recent list of included species.

Mosquitoes from various localities in Fiji, from Samoa, the Ellice Islands, the Tokelau Islands and the islands of south-eastern Polynesia as far east as the Marquesas and Mangareva Islands, have since been identified as *A. 'pseudoscutellaris'* and have been the subject of extensive research. Bahr (1912), in Fiji, proved *A. 'pseudoscutellaris'* to be the principal intermediary host of non-periodic filariasis, and thus drew attention to its medical and economic importance. O'Connor (1923) showed that *A. 'pseudoscutellaris'* played a similar rôle in Samoa and in the Ellice and Tokelau Islands; McKenzie (1925) did likewise in the Cook Islands; and Byrd *et al.* (1945) repeated the observations in Samoa. Buxton and Hopkins (1927), also in Samoa, made a detailed study of the biology of *A. 'pseudoscutellaris'*; Edwards (1926) described the male genitalia and figured those of a Samoan specimen, and Farner and Bohart (1944, 1945) and Bohart and Ingram (1946) gave further descriptions or figures. Farner and Bohart (1945), Stone and Farner (1945) and Marks (1951) provided recent summaries of the distribution of *A. 'pseudoscutellaris'*, while Woodhill (1950) described unsuccessful attempts to cross *A. 'pseudoscutellaris'* with *A. scutellaris scutellaris* (Walker) and *A. scutellaris katherinensis* Woodhill.

Edwards (1935) described a second Fijian member of the *scutellaris* group, *A. horrescens*. It is readily identified by characters of the larva and male genitalia, but females are not always separable from *A. 'pseudoscutellaris'*.

A colony of *A. 'pseudoscutellaris'* is maintained at the London School of Hygiene and Tropical Medicine, derived from larvae sent to Sir Philip Manson-Bahr from Fiji by the late Mr. D. W. Amos in August, 1948. From this colony I have kept a subcolony in the Zoology Department of the University of Cambridge since November, 1949, and have examined some hundreds of specimens in detail for research purposes. They show constant differences in the male genitalia from the form generally identified in the past as *A. 'pseudoscutellaris'*, and as a rule can also be distinguished by differences in scutal scaling. More recently, specimens reared from eggs obtained by Mr. B. A. O'Connor from wild-caught adults from Naduruloulou, near Suva, proved to be the same form as those maintained in the colony. Both types are represented among specimens collected by Sir Philip Manson-Bahr in Fiji in 1910, which include a male of each type from Tamua Vua, Suva. The male which resembles the colony specimens is now in the collection of the London

School of Hygiene and Tropical Medicine, and the one which resembles the published figures of *A. 'pseudoscutellaris'* is in the collection of the British Museum (Natural History).

The previous confusion of the two forms is not surprising, as the differences are small and those of the male genitalia not very obvious unless the genitalia are dissected and the basal lobe of the coxite examined in lateral view. As, however, the laboratory colony breeds true for its distinctive characters, and as both forms can occur in the same locality, it is believed that two distinct sibling species (apart from *A. horrescens*) have hitherto been included under the name *A. 'pseudoscutellaris.'*

Examination of the type-specimens of *A. (S.) pseudoscutellaris* (Theobald) shows that it is the laboratory colony which, in fact, represents the true *A. pseudoscutellaris*. So far, specimens of it have been identified only from the above-mentioned localities on Viti Levu and from Savusavu, Vanua Levu, Fiji.

The widespread pest species and filaria-carrier of Polynesia therefore requires a new name, and I propose to call it *Aedes (Stegomyia) polynesiensis* sp. nov. I have selected as the holotype male a specimen in the British Museum (Natural History) collection from Taveuni, Fiji (R. W. Paine, 1933; B.M. 1933-631), bred 'from barrels put out for breeding *Megarhinus* some distance from forest,' with associated larval (badly damaged) and pupal skins (67f). The allotype female is from the same locality (no data on breeding-place), with associated larval and pupal skins (67g).

The following are the best-marked distinguishing characters of the adults.

***A. pseudoscutellaris* (Theobald)**

Scutal angle with a patch of pale narrow-curved scales, very rarely fewer than five, and usually extending in a somewhat indefinite line along the antero-lateral margin of the scutum.

Basal lobe of male coxite simple, with setae extending nearly to base dorso-laterally and a row of three to five (rarely two or six) stout specialized setae dorsally.

***A. polynesiensis* sp. nov.**

Scutal angle and antero-lateral margin of scutum entirely dark-scaled or, at most, two or three pale narrow-curved scales on scutal angle (two in holotype).

Basal lobe of male coxite simple, with setae extending nearly to base dorsally but without stout specialized setae.

The male genitalia figured as those of *A. 'pseudoscutellaris'* by Edwards (1926), Farner and Bohart (1944, 1945) and Bohart and Ingram (1946) are those of *A. polynesiensis*.

Sufficient larval material of *A. polynesiensis* has not been available for a lengthy comparison of the two species. The only apparently constant difference so far observed is in the comparative lengths of the upper and lower pair of gills. In *A. pseudoscutellaris* the length of the lower pair of gills is 0.78-0.95 of the upper; in *A. polynesiensis* (allotype skin and four specimens from Savaii, Samoa) it is 0.67-0.70. The difference in this character between the two species will explain the note by Buxton and Hopkins (1927) that, although the gills of the dorsal pair are one-third larger than those of the ventral pair in all specimens of *A. 'pseudoscutellaris'* from Samoa, Paine in Fiji had found this character variable.

The following is a comparison of the distribution of the two species from specimens identified on characters of scutal scaling. I have examined specimens from all areas

except the Marquesas Islands, specimens from which have been seen by Mr. P. F. Mattingly, of the British Museum (Natural History). The asterisk indicates that I have verified the identification from male genitalia. *A. 'pseudoscutellaris'* is recorded from the Tokelau Islands and Wallis Island, but specimens have not been seen. A male from Rotuma Island, which Edwards (1929) noted as differing in genitalia characters from *A. 'pseudoscutellaris,'* is definitely not identifiable with *A. polynesiensis*, although a female from Rotuma is not separable from this species; further specimens will be needed to elucidate the relationships of the form from this locality, and it would be desirable to compare males from the Ellice and Tokelau Islands also.

<i>A. pseudoscutellaris</i>	<i>A. polynesiensis</i>
* Fiji	* Fiji
	* Samoa
	Ellice Islands
	Cook Islands
	* Society Islands
	* Austral Islands
	* Mangareva Islands
	* Tuamotu Islands
	* Marquesas Islands

A. polynesiensis is, then, the generally recognized vector of filariasis. The rôle of the true *A. pseudoscutellaris* as a vector has yet to be established, though Bahr (1912) apparently used both species in his experiments and females of the laboratory colony feed readily on human blood. As *A. polynesiensis* is the only species of the *scutellaris* group known from Samoa, it may be presumed that O'Connor (1923) and Byrd *et al.* (1945) had only this species when they proved that *A. 'pseudoscutellaris'* was the vector in the Samoan archipelago.

A full account of the studies on *A. pseudoscutellaris* is in course of preparation.

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