Pacific Insects Vol. 19, no. 3–4: 165–248 30 Decemder 1978

A REVIEW OF THE MOSQUITO FAUNA OF THE SOLOMON ISLANDS (DIPTERA: CULICIDAE)[1]

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Abstract: This review brings up to date the knowledge of the mosquitoes of the Solomon Islands. Almost 200 new distribution records are detailed for 80 of the 99 species and partially described forms now known from the islands. A systematic treatment covers all the species and a geographical treatment gives the species found and notes on all known collections for each island or island group. Summaries are given of the adult and juvenile bionomics, including a classification of breeding sites and new records of *Coelomomyces* fungus infections in larvae.

The islands considered in this review form a part, the major part, of the Solomon Islands (FIG 1.). The Santa Cruz Islands, or Eastern Outer Islands, although politically part of the Solomons, are not considered because they are regarded as belonging to a separate faunal area (Belkin 1962) and have been dealt with in detail by Maffi & Taylor (1974). Conversely, the island of Bougainville, which is part of the Solomons faunal area, is not part of the political area of the Solomon Islands and it also is not considered in detail in this review.

The Solomon Islands comprise a scattered archipelago of mountainous islands of continental character formed by tectonic folding, and with numerous extinct and dormant volcanic cones and low-lying coral atolls. The major islands form a double chain stretching southeasterly for 850 km from the Shortland Islands to Ulawa and Santa Ana, lying between 5°S to 11°55'S and 155°30'E to 162°55'E. The major islands are, to the north, Choiseul, Santa Isabel and Malaita and, to the south, New Georgia, Guadalcanal and San Cristobal. Numerous smaller islands and groups of islands are interspersed in the double chain while to the north and east lie the coral atolls of Ontong Java and Sikaiana, and to the south lie the raised coral islands of Rennell and Bellona.

The major islands are characterized by precipitous, thickly forested, mountain ranges intersected by deep narrow valleys. The coasts are frequently surrounded by extensive coral reefs and lagoons and there are widespread mangrove swamps in many areas. Guadalcanal is unique in having a large expanse of flat grassy plain on the north-central side of the island.

The climate of the Solomons is equatorial but is modified by the surrounding ocean. The annual mean temperature is around 27°C at Honiara, the capital on Guadalcanal,

1. Partial results of fieldwork supported by grants to Bishop Museum by the U.S. National Science Foundation (G-2127, G-4774, GB-518) and the U.S. Army Medical Research & Development Command (DA-MD-49-193-62-G65) and a grant to Dr. J.L. Gressitt from the Guggenheim Foundation (1955-56).

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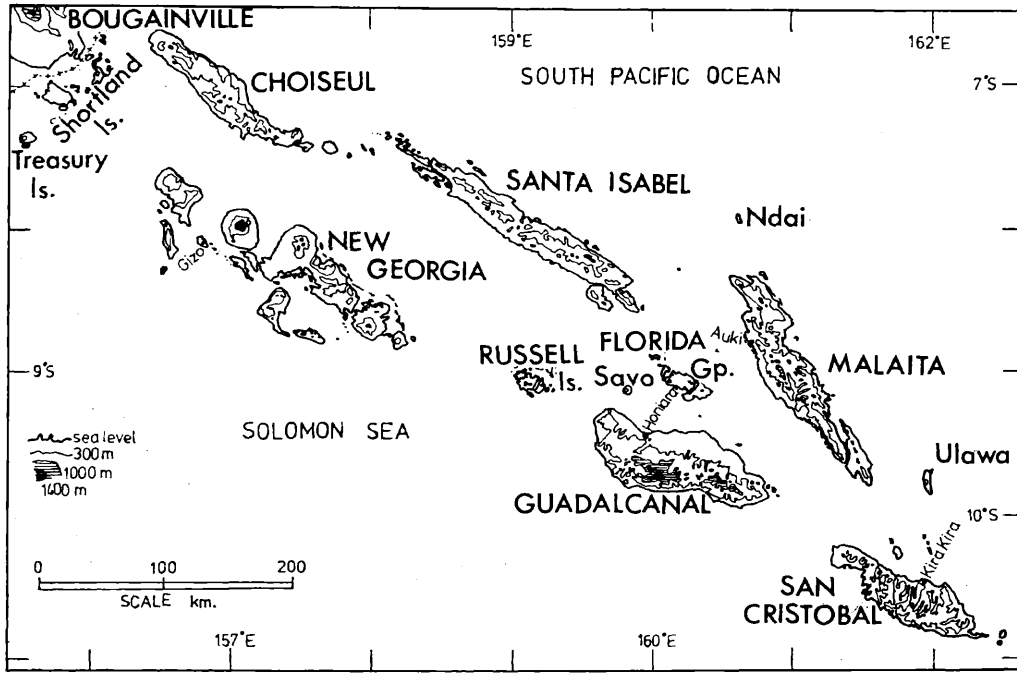

FIG. 1. The principal islands of the Solomon Islands.

and at Kira Kira, on San Cristobal, the temperatures between 1965 and 1970 ranged between an average maximum of 29.6°C and an average minimum of 22.2°C. The annual rainfall for the Solomon Islands as a whole averages 3000 to 3600 mm. However, the outer coasts of the island chain are considerably wetter than the inner coasts. This is well illustrated by data from Malaita where the average annual rainfall recorded at stations on the west (inner) coast is 3182 mm at Auki (based on figures for 1926–50 and 1954–64), 3608 mm at Dala (1962–65 and 1968–69), 3571 mm at Malu'u (1962–65) and 3335 mm at Hauhui (1963 and 1967–69), but on the east (outer) coast the averages are 4838 mm at Nafinua (1961–65) and 4835 mm at Kwai (1962–66 and 1969). In some areas the annual rainfall can be as much as 7600 mm. In recent years cyclones have apparently become more frequent and these can bring enormous downpours: in April 1970 at Auki, where the average April rainfall is 274 mm, the month's rainfall totalled 917 mm of which 386 mm fell in 1 day.

There are rarely long periods without rain and this, in combination with the relatively high temperature and humidity, gives conditions which are usually very favorable for the development and longevity of mosquitoes. Consequently, the mosquito-borne diseases malaria and filariasis are extremely prevalent.

The total population of the Solomons in February 1970 was over 139,500 with an overall density of 5.8 persons per km^2, varying on the large islands from 11.8 per km^2 on Malaita to 2.16 per km^2 on Santa Isabel. The overall population growth between

February 1970 and July 1973 was estimated as being over 11%. With the exception of the inland populations on Guadalcanal, Malaita and, to a lesser extent, San Cristobal, and a few inland villages on Choiseul and Santa Isabel, the people all live in close proximity to the sea on the typically narrow coastal strips of flat land or on lagoon islands.

Honiara is the only large town with over 17,000 inhabitants, although there are small townships at Auki, the Malaita District headquarters, Gizo, the Western District headquarters, and Yandina, Russell Islands. Ports of entry for overseas shipping are Honiara, Gizo, Yandina and Ringgi Cove, Kolombangara. International airports are at Henderson Field, near Honiara, and at Munda, New Georgia.

The majority of the people are engaged in subsistence farming and fishing. Their only important cash crop is the coconut palm. Copra, the dried flesh of the coconut fruit, is one of the main exports and large commercial plantations are found on northern Guadalcanal, the Russell Islands and elsewhere. Other agricultural projects on a commercial scale are rice, oil palm and cattle production, all on northern Guadalcanal, although there are considerable numbers of cattle in the Russell Islands, where they are used to keep the undergrowth short in the coconut plantations.

Timber is a major export with large forestry operations on Kolombangara at Ringgi Cove, on New Georgia at Viru Harbour and on Santa Isabel at Allardyce Harbour, although the last was severely disrupted by a cyclone in 1972. Fishing on a commercial scale based at Tulagi was started in the early 1970's. Potential mining operations for bauxite, on Rennell and Waghena, and for nickel ore, on San Jorge, are still being evaluated.

THE MOSQUITO FAUNA

This review can at best do no more than complement the work of Belkin whose 1962 monograph *The Mosquitoes of the South Pacific* contains detailed descriptions and notes for nearly all the mosquito species which have been collected in the South Pacific. We are concerned primarily with the mosquitoes of the Solomons and from this point of view Belkin's treatment, although thorough, was necessarily brief. Simply because of a lack of information, the distribution of the different species was not very well documented (Belkin 1962: 43).

Almost the only systematic collections of mosquito material prior to 1962 were those made by Belkin and his colleagues concerned with anti-malaria work for the United States Military Forces in 1943 to 1945. This work was limited to strategic areas (Belkin et al. 1945, Perry 1950) on Guadalcanal—on the north coast from Maravovo to Aola Bay [from sea level to a couple of hundred meters high and perhaps 6 km inland (Belkin 1950)] and at West Cape; on the Russell Islands; on the Florida Group—mainly around Port Purvis; on the New Georgia Group—in the Munda area including Roviana and Arundel and at Seghe Point; on Rendova and Kolombangara; and on the Treasury Islands.

The majority of other collections had been made, incidentally to their other duties, by medical officers and agricultural entomologists. Thus, in addition to the above areas,

there were scattered and limited records from Vella Lavella, Gizo, Santa Isabel, Savo, Malaita, Ulawa, San Cristobal and its adjacent small islands, and the outlying islands. The only records from an inland area were those of Laird on Guadalcanal (Laird 1955, 1956).

Since 1962 the only published records of new mosquito collections have been by Slooff, whose principal work other than on malaria vectors was on Choiseul (Slooff & Marks 1965, Slooff 1972), and by us and our associates [Maffi 1973a, 1973b, Taylor 1973 (relating to work on Rennell and Bellona); Taylor 1972, Taylor & Maffi 1971, Taylor & Tenorio 1974 (various species descriptions); Maffi & Genga 1970 (notes on *Coelomomyces* fungus infections in larvae) and Taylor 1975 (observations on the *Anopheles punctulatus* complex)].

Between 1968 and 1973 we visited, in the course of our malaria work, nearly all the inhabited islands and wherever possible we made surveys of the local mosquito fauna. In the course of our research we also identified mosquito specimens collected by various Bishop Museum field workers. Although we discovered few new species and forms, we succeeded in collecting specimens of 80 of the 99 species and partially described forms now known from the Solomons. The establishment of nearly 200 new island records for the various species means that a much clearer picture of the overall distribution of mosquito species in the Solomons can now be seen.

Those species which were not rediscovered are, with few exceptions, described as rare by Belkin (1962); several are known only from 1 collection or from a few collections on a single island. Ten of these species breed exclusively in leaf axils—water collections which are particularly prone to drying out and thus posing an obvious problem when one is making random collections. The dense jungle swamps on north Guadalcanal from which Belkin and his colleagues made collections of some of these species have now largely disappeared with the improved management of plantations and the increased clearance of land for gardening.

We have divided our review into 3 parts: Systematic treatment—dealing with each species in turn with notes on bionomics and distribution and details of previously unpublished collections; Geographical treatment—dealing with each island or island group in turn, with a brief description of the island and a list of all known species with references to a subsequent summary of the work of all those known to have made collections on the island; and Bionomics summary—including notes on adult behavior, especially feeding and resting habits, on juvenile habitats, on predaceous larvae, and on larval infections, especially by *Coelomomyces* fungi.

Throughout the review the islands are dealt with in an approximate west to east order within the 4 administrative districts (Western, Central, Malaita and Eastern). The names of the islands are those used in the 1:1,000,000 map of the Solomons published by the Directorate of Overseas Surveys in 1969[4]. In contrast to Belkin's treatment (1962

4. Ref: D.O.S. (Misc.) 347A Edition 2—D.O.S., obtainable from Edward Stanford Ltd., 12/14, Long Acre, London, W.C.2., England.

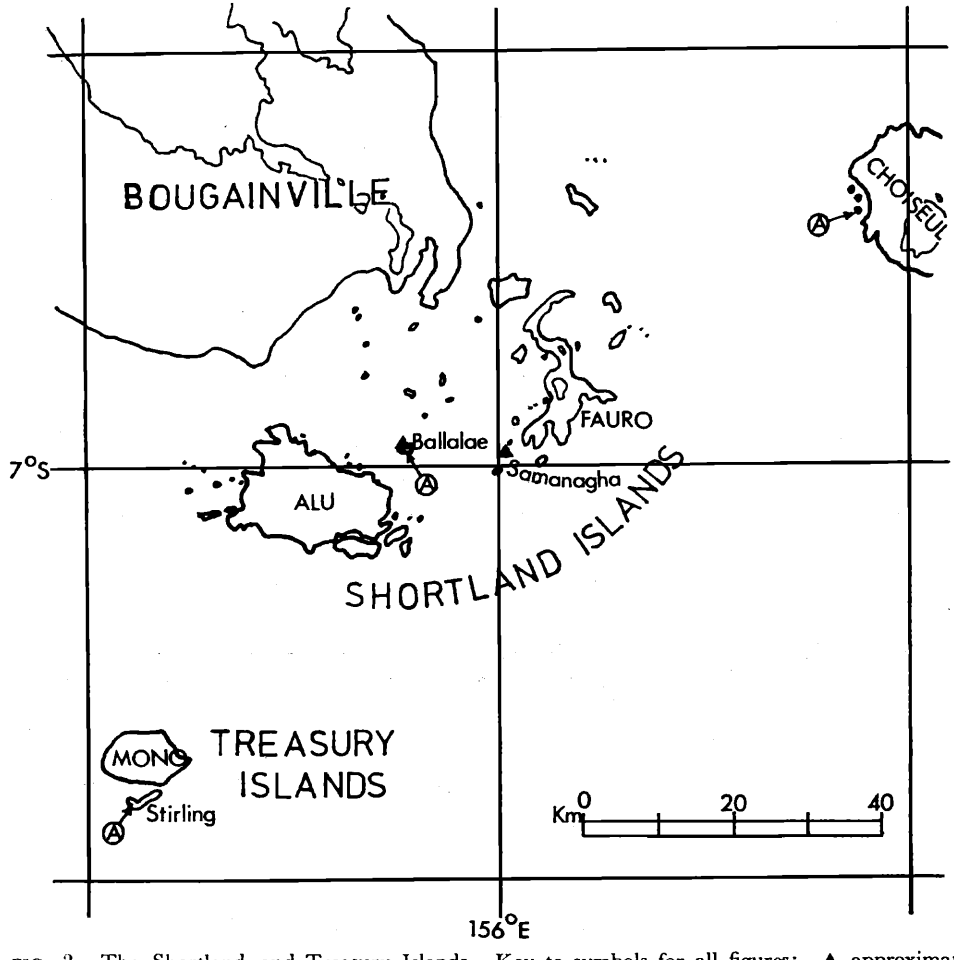

FIG. 2. The Shortland and Treasury Islands. Key to symbols for all figures: ▲ approximate location of collecting sites; Ⓐ airfields; - - - roads; ■ Adm. Distr. Headquarters. Contour line 300 m.

(2): 10–12) we have not separated the islands of New Georgia, Arundel (Kohinggo), Ondanga, Wana Wana (Wona Wona or Vona Vona), Roviana, Sasavele and Vangunu (Vanguna) as these, together with Nggatokae and innumerable small lagoon islands, form an almost contiguous land mass with a fringing lagoon that we call simply the New Georgia Group. The politico-geographical area known as the New Georgia Islands (FIG. 4) includes Vella Lavella, Ranongga, Simbo, Kolombangara, Gizo, Rendova and Tetepare in addition to the New Georgia Group.

The maps of the islands (FIG. 2–10) show all the mosquito collecting areas we have been able to locate. The use of natural materials for house construction, for example timber and sago palm leaf thatch, means that houses are no more than semi-permanent and relocation of villages is not infrequent, especially in inland areas. Place names are

not always reliable and changes, such as for religious reasons, have occurred in the over-60 years of mosquito collecting in the Solomons.

SYSTEMATIC TREATMENT

FAMILY CULICIDAE

SUBFAMILY CULICINAE

In this review we are dealing solely with the subfamily Culicinae, comprising the true mosquitoes, as defined by Belkin (1962: 115–18). The tribes, genera and subgenera are, in general, those defined by Belkin, but we have borne in mind the changes, principally to the Mansoniini, recognized by Stone (1967, 1970) in supplements to Stone et al. (1959). The comments made by Mattingly (1971) and Peyton (1972) are also taken into consideration.

The tribes represented in the Solomons are the Anophelini, Uranotaeniini, Culicini, Aedeomyiini, Hodgesiini, Ficalbiini, Mansoniini, Aedini and Sabethini.

The notes on taxonomy, bionomics and distribution are based primarily on Belkin (1962) together with the findings of Slooff (1972) and our personal observations. Of great assistance to us was the free access Dr Belkin gave us to his personal notes and record sheets.

Previously unpublished mosquito findings are given for each species under the heading "collection details." These findings include the results of adult catches made between 1956 and 1964 by a number of field workers from Bishop Museum: J. L. Gressitt (JG), C. W. O'Brien (CB), P. Shanahan (PS), J. & M. Sedlacek (JS) and R. Straatman (RS). These adults were identified by one of us (B. T.) in July 1973. The initals of the respective collector are given with the details.

The majority of the results are from collections made by us with the assistance of the staff of the entomology section of the B.S.I.P. Malaria Eradication Programme and by others of our colleagues. Particular assistance was given by E. Sosimo Horoto. Adult specimens were pinned and most of the juvenile stage material was ultimately mounted in polyvinylic lactophenol, Permount or euparal. Whenever possible juvenile material was individually reared and associated larval and pupal pelts and adults are shown in the collection details.

Most of the specimens were identified by following the keys in Belkin (1962). Nearly all of the pinned adult specimens and slide mounts have been deposited in Bishop Museum, Honolulu, Hawaii, where they form a part of the "Mosquitoes of the Papuan Sub-Region Project" collection.

The results under each species are arranged in island order (from west to east through the archipelago) and chronologically for each island (or island group). The following abbreviations are used in the collection details: ♂, ♀; juv=juvenile stages (number of specimens not given); L=intact larva; l=larval pelt; P=intact pupa; p=pupal pelt. *=first record on that particular island. Code numbers are used as follows: (MM,

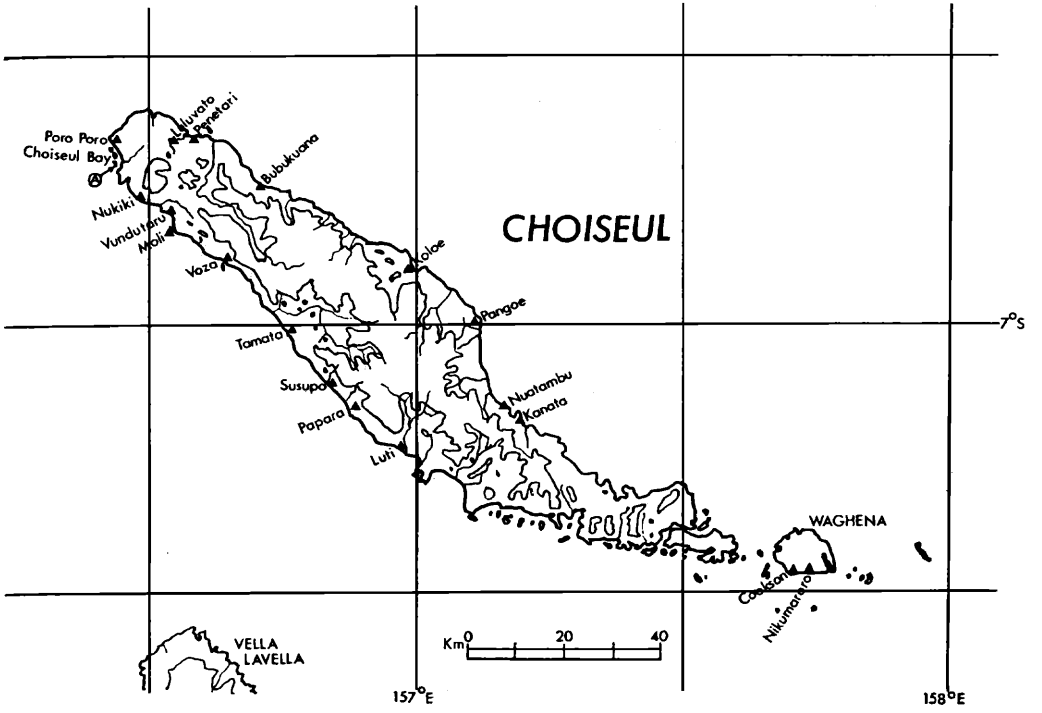

FIG. 3. Choiseul and Waghena (see FIG. 2 for key to symbols).

690320/1; etc.)=M. Maffi juvenile mounts; (T/G. 17; T/Mala. 17; etc.)=B. Taylor juvenile mounts; (T/0894-5; T/1021; etc.)=B. Taylor adult specimens.

The abbreviations used for the genera and subgenera of mosquitoes are those suggested by Reinert (1975).

TRIBE ANOPHELINI

There are 3 strongly differentiated genera recognized in the tribe at present. *Anopheles*, the dominant genus, has a nearly worldwide distribution, although in the South Pacific it is found only in the Solomons, Santa Cruz Islands and the New Hebrides. The genus *Bironella* is restricted to the Papuan area and in the South Pacific is represented only in the Solomons. The 3rd genus, *Chagasia*, is purely Neotropical.

GENUS **Bironella** Theobald

A relatively poorly known genus with 2 recognized subgenera, *Bironella* and *Brugella*. The latter is represented in the South Pacific by a single species, *Bi. hollandi*, known only from the Solomons.

Subgenus **Brugella** Edwards

Bironella (Bru.) hollandi Taylor, 1934

Bi. hollandi: Belkin, 1962: 130–33.—Slooff, 1972: 176–77.

The immature stages are very commonly found in undisturbed permanent or semipermanent bodies of water, such as streams and swamps, and most frequently in deep shade. Temporary pools and even artificial containers are sometimes utilized. Adults have never been collected in the field and the species is not known to attack man.

Distribution. Treasury Is, Choiseul, Vella Lavella, Gizo, New Georgia Gp., Russell Is, Florida Gp., Guadalcanal, Malaita, San Cristobal. Also Bougainville, New Ireland and New Guinea.

Collection details. *Choiseul:* 20.II.1969, Vundutaru, ground pool, muddy water, juv (MM); 20.III.1969, Koloe, shaded pool full of dead leaves, juv (MM, 690320/1 & 2). *Vella Lavella:* 13.VII.1969, Barakoma R, isolated ample pool with dead leaves, juv (MM, 690713/1); same data except larger pool, more sun, juv (MM, 690713/2). *Florida Group:* 7.VI.1969*, Big Nggela, Togha, rocky well in shade and sand-barred stream mouth, juv (MM, 690607/1); 12.VIII.1969, Sandfly I, Sarasuma Cr, slow running, clear water, grassy, juv (MM, 690812/2). *Guadalcanal:* 7.X.1968, New Tenabuti, clear running stream, juv (MM); 14.XI.1968, White R, Honiara, clear running stream, grassy edges, juv (MM); 6.VII.1972, Ruaniu Plantation, freshwater swamp, 2 p (T/G. 17) assoc. ♀ & ♂ (T/0894-5); 2.XI.1972, Komukama, Berande R, shaded still pool, 4L (T/G. 19). *Malaita:* 8.IV.1970*, Kiu, Are Are, running stream, juv (MM, 700408/4); 20.XI.1972, Tawairoi, ground pool, 1 P (T/Mala. 17), 1 ♂ (T/1021). *San Cristobal:* 1971*, Mwanihuki R, juv (E. S. Horoto, specimens not preserved).

Genus **Anopheles** Meigen

The genus *Anopheles* is widely distributed throughout the world and at least 4 subgenera are uniformly recognized: *Stethomyia* (Neotropical); *Anopheles* (widely distributed); *Nyssorhynchus* (Neotropical); and *Cellia* (Old World).

In the South Pacific only the group *Neomyzomyia* of the subgenus *Cellia* is represented and is restricted to the Solomons except for *An. farauti*, which also occurs in the Santa Cruz Islands and the New Hebrides.

Subgenus **Cellia** Theobald

Six species of *Anopheles* (*Cellia*) are known from the Solomons and these can be divided into 2 complexes, the *An. punctulatus* complex and the *An. lungae* complex.

PUNCTULATUS COMPLEX

Extensive anopheline survey work has been carried out since 1962 by staff of the B.S.I.P. Malaria Eradication Programme and a detailed summary of the *punctulatus* complex findings together with notes on the biology of the species, *An. farauti*, *An. punctulatus* and *An. koliensis*, has been made by Taylor (1975). Bryan (1973) has been study-

ing the complex, using cross-mating techniques, and so far her results indicate 4 species. Two of these species are morphologically identical and show the all black proboscis characteristic of *An. farauti*. Bryan identifies these provisionally as *An. farauti* No. 1, from New Britain and the Solomons, and *An. farauti* No. 2, from Queensland, Australia. The other 2 species, on morphological and reproductive bases, are *An. punctulatus* and *An. koliensis*, but all the colonies studied had originated in Papua New Guinea.

Maffi (1973a, 1973b) discovered a population of the *punctulatus* complex on Rennell which showed a number of morphological differences from both *An. farauti* and *An. koliensis*. He refers to this population as *An.* cf *koliensis* and we have placed it under *koliensis* for the time being although it underlines the need for a complete study of the complex throughout its range.

Anopheles (Cel.) farauti Laveran, 1902

An. farauti: Belkin, 1962: 138-41.—Slooff, 1972: 174-75.—Taylor, 1975.

This species is the most widespread and commonest member of the complex and the main vector of malaria and filariasis in the Solomons. It breeds in almost all kinds of water collection, ranging from brackish pools to small natural containers such as coconut shells, but not in leaf axils or treeholes. In the Solomons *An. farauti* is not too common at any great distance from the coast and its highest densities are usually in coastal swamps and low-lying riverine areas.

DISTRIBUTION. All inhabited islands of the Solomons. Also Moluccas, Peleng, Banda Is, New Guinea, Bismarck Archipelago, Admiralties, Santa Cruz Is, Banks Is, New Hebrides. The Australian records probably refer to a population which is genetically incompatible with the New Guinea and Solomons populations (Bryan 1973).

COLLECTION DETAILS. Numerous adult and juvenile specimens have been deposited in the Bishop Museum but few of these represent new distribution records. Of particular interest are larvae infected with a *Coelomomyces* fungus (Maffi & Genga 1970); new records of these are as follows: *Gizo Island:* 16.VI.1972, New Manda, freshwater taro swamp, 10 L, 1 with *Coelomomyces* sporangia (T/W. 13). *Guadalcanal:* 19.VI.1972, Lake Nggiluvangga, 8 L, 1 with *Coelomomyces* sporangia (T/G. 13); 15.XI.1972, Turarana R, 9 L, with *Coelomomyces* sporangia (T/G. 27).

Anopheles (Cel.) punctulatus Donitz, 1901

An. punctulatus: Belkin, 1962: 141-43.—Slooff, 1972: 175-76.—Taylor, 1975.

This species is the least common member of the complex in the Solomons. It breeds almost exclusively in temporary rainwater pools and is found principally in areas of alluvial soil deposits. Guadalcanal is the only island with widespread deposits of this type and, thus, it is the only island where the species has been at all abundant. The effect of DDT house-spraying operations has been to make this species very uncommon, even on Guadalcanal, although in late 1972 a resurgence of the species appeared to be contributing to epidemics of malaria in inland riverine areas of east and central Guadalcanal.

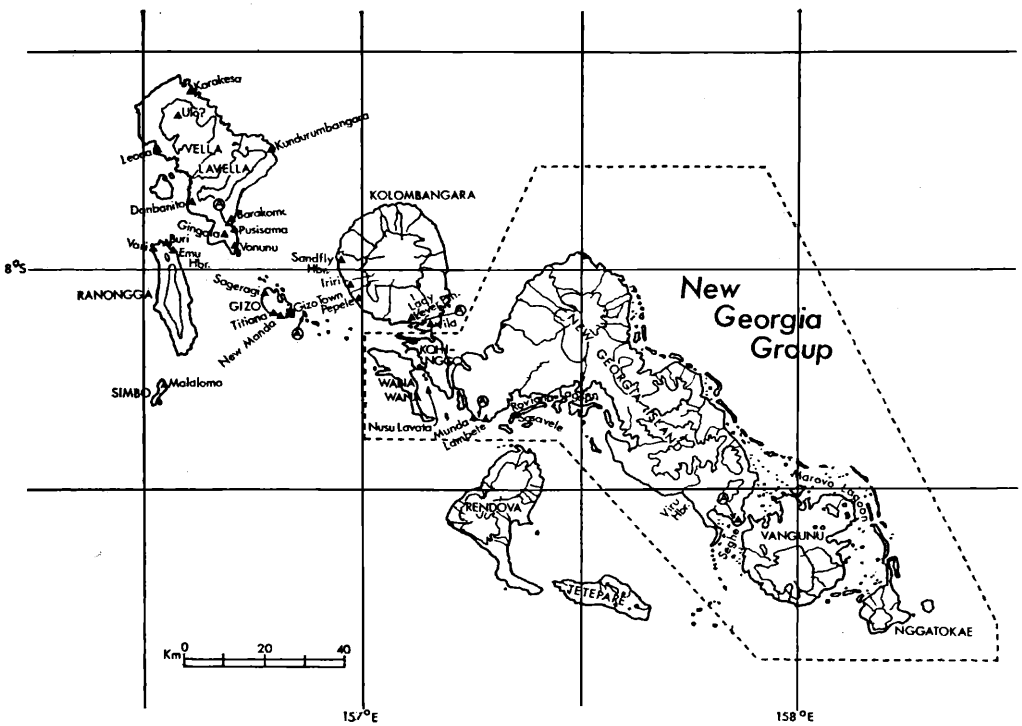

FIG. 4. New Georgia Islands (see FIG. 2 for key to symbols).

DISTRIBUTION. Santa Isabel, Guadalcanal, Savo, Malaita, San Cristobal. Also Bougainville, Bismarck Archipelago and New Guinea.

COLLECTION DETAILS. *Santa Isabel:* 7.IX.1964, Tatamba, 0–50 m, malaise trap, 1 ♀ (RS). *Guadalcanal:* 3.XI.1972, Vatilau, Berande R, night man-biting, 1 ♀ (T/1001); 4.XI.1972, Dae Dae, Berande R, night man-biting, 3 ♀♀ (T/1002-4); 5.XI. 1972, Tauvianguru, Berande R, night man-biting, 2 ♀♀ (T/1005-6); 6.II.1973, Dae Dae, night man-biting, 3 ♀♀ (T/1030-2). *Malaita:* 20.VI.1964, Dala, malaise trap, 1 ♀ (RS). *San Cristobal:* 11.III.1971*, Manibwena, indoors day-resting, 2 ♀♀ (T/0397-8); 13.V.1971, Nagau, 1 ♀ (T/0961); 20.VII.1971, Manibwena, ground pool, exposed to sun, water hot, 5 L (T/Mak. 33); 12.IV.1972, Arohane, ground pool, no vegetation, 1 p (T/Mak. 48) assoc. ♀ (T/0841); 25.VII.1972, Arohane, indoor day-resting, 1 ♀ (T/0954).

Anopheles (Cel.) koliensis Owen, 1945

An. koliensis: Belkin, 1962: 144–45.—Slooff, 1972: 175.—Maffi, 1973a, 1973b: 44.—Taylor, 1975.

The species is now known to have been widespread on all the major islands, other than the New Georgia Group and the Russell Islands. It is not as common as *An. farauti* prob-

ably because *An. koliensis* breeds primarily in temporary pools in grassland and at the edge of the jungle. Such pools are most common in the vicinity of the larger and more permanent human settlements, particularly riverine villages, both in coastal and inland areas. The species may well have been responsible for the particularly high endemicity of malaria in these villages. The effect of DDT house-spraying operations has been to make the species extremely scarce. Several larvae collected on San Cristobal were found to be infected with a *Coelomomyces* fungus. This is the first report of such an infection in *An. koliensis*.

DISTRIBUTION. Choiseul, Santa Isabel, Florida Gp., Guadalcanal, Rennell, Malaita, San Cristobal, Ugi. Also Bismarck Archipelago and New Guinea.

COLLECTION DETAILS. The Rennell specimens have been reported by Maffi (1973a, 1973b) as *An.* cf *koliensis*. *San Cristobal:* 2.X.1970, Magoha R, 4.5 km inland, rock pools along the bank, 1 L, 1 P (MM, 701002/1); 11.III.1971, Manibwena, night man-biting, 1 ♀ (T/0399); 20.VII.1971, Kira Kira, shaded wheel rut, 1 L, infected with *Coelomomyces* (T/Mak. 20); same data except wheel rut, grassy, in semi-shade, 3 L (T/Mak. 21); same except wheel rut, exposed to sun, 3 L, all infected with *Coelomomyces* (T/Mak. 22); same except cattle trough exposed to sun, 1 L (T/Mak. 30); same date, Manibwena, wheel rut, semi-shade, 2 L, 1 with crenellated *Coelomomyces* sporangia (T/Mak. 35). *Ugi:* 14. X.1970*, Alangaula School, ditches round football field, semishaded muddy water, vertical vegetation, 3 L (MM, 701014/4).

LUNGAE COMPLEX

The complex, which is definitely known only from the Solomons, consists of 3 species, *An. lungae*, *An. nataliae* and *An. solomonis*.

Anopheles (Cel.) lungae Belkin & Schlosser, 1944

An. lungae: Belkin, 1962: 147–49.—Slooff, 1972: 176.

Probably the most common member of the complex, it breeds in deeply shaded freshwater pools and streams and is predominantly coastal. Although often abundant and readily collected in outdoor-resting searches, it rarely attacks man and is not involved in the transmission of human diseases. Slooff (1972) reported that precipitin tests showed more than 80% of blood meals had been taken on birds.

DISTRIBUTION. Treasury Is, Choiseul, Waghena, Vella Lavella, Kolombangara, New Georgia Gp., Santa Isabel, Florida Gp., Guadalcanal, Malaita, San Cristobal, Ugi. Also Bougainville.

COLLECTION DETAILS: *Choiseul*: 19.II.1969, Papara, creek, grassy, juv (MM); 20.II. 1969, Vundutaru, ground pool, muddy water, juv (MM); 20.III.1969, Koloe, shaded pool, juv (MM, 690320/1); same data except creek, grassy, juv (MM, 690320/2); 20. III.1973, Poro Poro, freshwater pool in bomb crater, deep shade, 1 p (T/W. 16) assoc. ♀ (T/1049). *Waghena:* 13.III.1969*, Cookson, small ditch, juv (MM, 690313/1). *Vella Lavella:* 17.XI.1963*, Gingola, at 60 m, trapped?, 1 ♀ (PS); 13.VII.1969, Bara-

koma, pool on dry river bed, juv (MM, 690713/3). *Kolombangara:* 9.VII.1964, Sandfly Harbour, 2 m, malaise trap, 1 ♀ (JS). *Santa Isabel:* 15.IX.1964, Tatamba, 0–50 m, malaise trap, 1 ♂ (RS). *Guadalcanal:* 14.I.1970, Honiara, collected in house, 2 ♀♀ (T/0039-40); 27.VI.1972, Henderson Airport, surface pools, 2 L (T/G. 14); 17.XI.1972, Nuhu, Sutakama R, riverside pools, 1 L (T/G. 28). *Malaita:* 25.VI.1964, Dala, malaise trap, 1 ♂ (RS); 22.III.1969, Wallande School, Maramasike, river, fast flowing, grassy, juv (MM, 690322); 25.III.1969, Ware Ware, Maramasike, rain pan in grass, muddy, juv (MM, 690325/1); 9.IV.1970, Kiu, taro swamp, juv (MM, 700409/2); 24.XI.1972, Tawanaora, deeply shaded stream, 0.5 km from village, 2 L (T/Mala. 4). *San Cristobal:* 13.IV.1972*, Kira Kira, small flowing stream, with vegetation, 1 L (T/Mak. 50); 25.VII. 1972, Arohane, stream edge, 1 L (T/Mak. 66); day outdoor-resting, 5 ♀♀, 2 ♂♂ (T/0942-8). *Ugi:* 13.X.1970*, E of Suasi, at the southern tip of the small lake, freshwater creek, in shade and floating detritus, 8 L (MM, 701013/7); same date, further east, just inland from the beach, ample shallow rainwater pool, in shade, 11 L (MM, 701013/10).

Anopheles (Cel.) nataliae Belkin, 1945

An. nataliae: Belkin, 1962: 149–50.—Slooff, 1972: 176.

This is a relatively rare species which has never been collected attacking man. It breeds mostly in springs, seepages and creeks in dense jungle shade.

Distribution. Choiseul, New Georgia Gp., Santa Isabel, Guadalcanal, San Cristobal, Also Bougainville.

Collection details. *Choiseul:* 21.II.1969*, Luluvato, fresh, running stream, sunny, juv (MM). *Guadalcanal:* 8.V.1964, Roroni, 10 m, malaise trap, 1 ♀ (RS); 6.IX.1970, Matanikau R, 3 collections, 7 L, 4 P (MM, 700906/1, 2 & 3). *San Cristobal:* 10.VIII. 1971*, Arohane, surface pool, juv (identified by E. S. Horoto but not preserved).

Anopheles (Cel.) solomonis Belkin, Knight & Rozeboom, 1945

An. solomonis: Belkin, 1962: 150–51.—Slooff, 1972: 176.

The juvenile stages are fairly common in shaded riverside pools, potholes in stream beds and similar pools. On Guadalcanal the species has been collected well inland and at altitudes up to 1000 m (Laird 1955). In inland areas it may transmit malaria although the evidence is purely circumstantial. The species was the only anopheline found by Laird (1955) at Talamu on Guadalcanal where he diagnosed malaria in a small child who was said never to have left the vicinity of the village. Females were collected biting in late 1972 and early 1973 at villages on Guadalcanal where an epidemic of malaria was in progress, but *An. punctulatus* and *An. farauti* were collected at the same time. Belkin's personal notes include a record from the Treasury Islands not in his published list.

Distribution. Treasury Is, Choiseul, Santa Isabel, Florida Gp., Guadalcanal, San Cristobal. Also Bougainville.

Collection details. *Choiseul:* 19.II.1969*, Voza, still freshwater pool, shade, juv (MM); 20.II.1969, Vundutaru, muddy ground pool, juv (MM); 21.II.1969, Luluvato,

fresh running stream, juv (MM); 7.III.1969, Tamata, running stream, juv (MM, 690307/1). *Santa Isabel:* 1-7.IX.1964, Tatamba, 0-50 m, malaise trap, 2 ♀♀, 1 ♂ (RS); 9.IV.1969, Talise, slow, grassy river, juv (MM, 690409/5). *Florida Group:* 11.VIII.1969, Sandfly I, Takavali, small creek in forest, juv (MM). *Guadalcanal:* 11.X.1968, source of R Soso, rocky holes, juv (MM); 28.X.1968, Chimbu, Lake Vonu, ditch, juv (MM); 29.X.1968, Salamarao, Haisihinia, R Kolosahata, clear, still border pool, grassy, juv (MM); 2.XI.1972, Komukama, Berande R, shaded still pool, 1 L (T/G. 19); 8.XI.1972, Jeriko, Berande R, riverside pools, 4 L (T/G. 23); 17.XI.1972, Nuhu, Sutakama R, riverside pools, 6 L (T/G. 28); 28.XII.1972, Bubunuhu, night man-biting, 1 ♀ (T/1035); 6.II. 1973, Dae Dae, Berande R, night man-biting, 1 ♀ (T/1028). *San Cristobal:* 10.VIII.1971*, Arohane, stream behind village, juv (identified by E. S. Horoto but not preserved).

Tribe URANOTAENIINI

The tribe consists of a single genus, *Uranotaenia.*

Genus **Uranotaenia** Lynch Arribalzaga

The genus is of no economic importance and is relatively poorly known. The majority of the species are known from the Old World tropics, although a few species extend beyond the tropics and a number are known from the New World. In the South Pacific *Uranotaenia* has been found in the Solomons, Santa Cruz Islands, New Hebrides and Fiji.

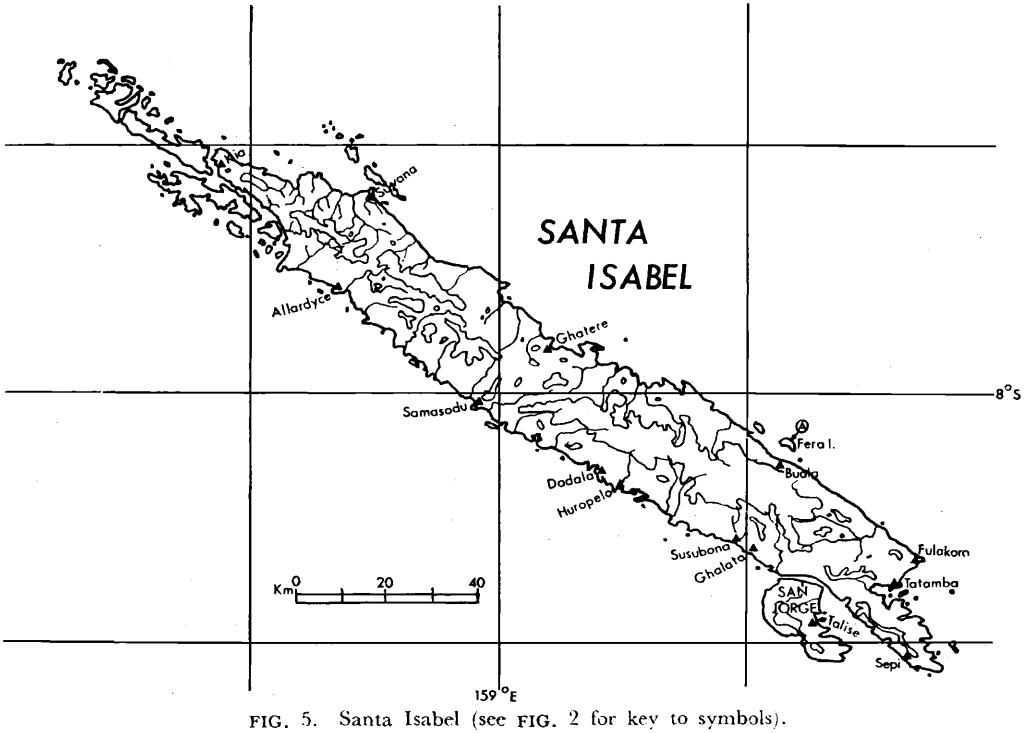

FIG. 5. Santa Isabel (see FIG. 2 for key to symbols).

Peyton (1972), in his review of the genus, resurrected and revalidated the subgenera *Uranotaenia* and *Pseudoficalbia*. The subgenus *Uranotaenia* includes the *wysockii* and *anisocheleomyia* sections (Belkin 1962: 154) and the subgenus *Pseudoficalbia* includes the *atra* section (Belkin 1962: 154).

Subgenus **Pseudoficalbia** (Theobald)

atra section

Uranotaenia (Pfc.) quadrimaculata Edwards, 1929

Ur. quadrimaculata: Belkin, 1962: 159-61.—Slooff, 1972: 177.—Maffi, 1973b: 44.

This species is probably the commonest member of the genus in the Solomons. The juvenile stages are most often found in fresh or foul water collections in coconut shells. They are also found in artificial containers, aroid leaf axils and small ground water collections with a high organic content. The adults are not known to attack man.

Distribution. Treasury I, Choiseul, Waghena, New Georgia Gp., Rendova, Mborokua, Russell Is, Santa Isabel, Florida Gp., Savo, Guadalcanal, Bellona, Malaita, San Cristobal, Ugi, Three Sisters Gp., Santa Ana and Santa Catalina. Also Bougainville.

Collection details. *Choiseul:* 20.II.1969, Vundutaru, 4 gallon (15 liter) drum, rainwater, juv (MM). *Waghena:* 25.II.1969*, Nukumaroro, depression filled with rainwater and leaves, juv (MM). *Mborokua:* 11.XI.1970*, treehole, 4 L (T/Mb.), 2 ♀♀, 4 ♂♂ (T/0359-64). *Santa Isabel:* 18.VIII.1964*, Buala, light trap, 1 ♀ (RS); 21.VIII.1964, Buala, coconut shell near beach, 3 ♀♀ (RS); 23.VIII.1964, Buala, coconut shell, 7 ♀♀ (RS); 4.IX.1964, Tatamba, malaise trap, 0–50 m, 1 ♀ (RS); 5.IX.1964, same locality, 1 ♀ (RS); 15.IX.1964, same locality, 2 ♀♀ (RS); 9.IV.1969, Sepi, 1/2 coconut shell, juv (MM, 690409/1). *Russell Islands:* 24.VII.1964. & 26.VII.1964, Banika I, Yandina, malaise trap, 100 m, 2 ♀♀, 2 ♂♂ (RS). *Florida Group:* 6.X.1964, Big Nggela, Haleta, malaise trap, 0–100 m, 1 ♀ (RS); 12.X.1964, same locality, malaise trap, 200–250 m, 5 ♀♀ (RS); 13.VIII.1969, Mangalonga I, Takola, coconut husk on beach, juv (MM); same date, E of Takola, coconut husk, juv (MM); 15.VIII.1969, Sandfly I, Leitongo, coconut husk, foul liquid, juv (MM); 6.I.1970, Big Nggela, Boromole, coconut husks, juv (MM, 700106/3 & 5), 2 ♀♀, 3 ♂♂ (T/0012-6); XII.1972, Big Nggela, Haroro, coconut, 1 ♀ (T/1023). *Savo:* 5.XII.1968*, Sosopaga Plantation, coconut shell, juv (MM). *Guadalcanal:* 17.V.1964, Roroni, malaise trap, 1 ♀ (RS); 24.V.1964, Tambalia, malaise trap, 1 ♀ (RS); 27.V.1964, Tambalia,? trapped, 2 ♀♀ (JS); 11.V.1971, Tambea, coconut shell, fresh water, 1 L (T/G. 1), 1 ♂ (T/0474). *Malaita:* 19, 24 & 30.VI.1964 Dala, malaise trap, 3 ♀♀ (RS); 25.XI.1972, Pisua, E Are Are, 290 m above sea level, coconut shell, freshwater and debris, 4 L (T/Mala. 10). *San Cristobal:* 7.XI.1964*, Kira Kira, malaise trap, 0–200 m, 7 ♀♀, 1 ♂ (RS); 8.XI.1964, Kira Kira, light trap, 0–50 m, 1 ♂ (RS); 10,13,15,20.XI.1964, Kira Kira, malaise trap, 0–50 m, 15 ♀♀, 6 ♂♂ (RS); 2.X.1970, Rauraha, on right bank of Magoha R, small semi-shaded ground pool on sandy-muddy bank, grassy, 5 L (MM, 701002/3); 9.X.1970, Namugha, Star Harbour, on beach, Tridacna shell, full of rainwater, 6 p (MM, 701009/4), 1 ♀, 4 ♂♂ (T/0379-83); 15.X.1970, Kira Kira, W of Pui Pui

R, waterlogged garden, 1 L (MM, 701015/1); 11.III.1971, Kira Kira, tin can of fresh water in swampy area, 2 L (T/Mak. 5); same data except tin plate containing rainwater, 3 ♂♂ (T/0413-5); 20.VII.1971, Manibwena, coconut, foul water, 3 L (T/Mak. 34); same data except banana stump, 3 L (T/Mak. 36); 22.VII.1971, Kira Kira, coconut, fresh water and debris, 21 (T/Mak. 26); same data except coconut shell, fresh water, 1 ♂, 2 ♀♀ (T/0416-8); same data except beach, canoe under construction, 2 L, 2 p (T/Mak. 27), assoc. 2 ♀♀ (T/0614-5); 23.VII.1971, Kira Kira farm, coconut, fresh water and debris, 1 L (T/Mak. 32); 22.VII.1972. Kira Kira, Pui Pui R bank, water on fallen sago palm leaf, 5 L, 3 p (T/Mak. 60) assoc. 1 ♀, 2 ♂♂ (T/0918-20). *Ugi:* 13.X.1970, mouth of Kerepei R, coconut shell, fresh water, 2 L (MM, 701013/2); same date, E of Suasi, in coconut grove, coconut spathe in sun, 4 L, 5 P (MM, 701013/9); same date, nr Sungasau, coconut husk, clear rainwater, 2 L, 4 P (MM, 701013/11); same date, nr Tawarogo, heaped coconut husks, 1 P (MM, 701013/12); 14.X.1970, Alangaula School, coconut husk, clear water, 6 L, 9 P (701014/3). *Santa Ana:* 6.X.1970*, 1 km S of Nafinuatogo, coconut grove, coconut 1/2 husk, 14 L (MM, 701006/4); collection details not recorded, 2 P (MM, 701006/3), 1 ♂ (T/0373); 29.IV.1971, Lake Wairapa, lake edge, 7 L (T/Mak. 15). *Santa Catalina:* 7.X.1970*, W of Ragapu, coconut husk, foul contents, 1 P (MM, 701007/4).

Subgenus **Uranotaenia** Lynch Arribalzaga

WYSOCKII SECTON

Uranotaenia (Ura.) wysockii Belkin, 1953

Ur. wysockii: Belkin, 1962: 163–65.

This is a very distinct species which breeds in leaf axils of pandanus species. Apparently uncommon but widely distributed. Found breeding in association with *Culex (Lop.) perryi* and *Aedes (Finlaya)* spp. of *kochi* gp.

Distribution. New Georgia Gp., Guadalcanal, Malaita, San Cristobal. Also Bougainville.

Collection details. *Malaita:* 29.XI.1972*, Maka, axils of very large, saw-edged broadleaf pandanus, 1 L, 1 P (T/Mala. 12). *San Cristobal:* 7.XI.1964*, Kira Kira, malaise trap, 0–200 m, 1 ♀ (RS).

ANISOCHELEOMYIA SECTION

Uranotaenia (Ura.) sexaueri Belkin, 1953

Ur. sexaueri: Belkin, 1962: 167–68.

This is an uncommon species whose adults have rarely been collected. The immature stages have been found only in dense jungle swamps in association with *Ur. barnesi* and *Ur. solomonis.*

Distribution. Guadalcanal. Also Bougainville.

Collection details. No new specimens collected.

Uranotaenia (Ura.) civinskii Belkin, 1953

Ur. civinskii: Belkin, 1962: 168–70.

This is a common and widely distributed species. Adults have been collected resting on rocks and taken in malaise traps. The immature stages are found mainly in riverside and streamside pools and often well inland. It was recorded from the Treasury Is lands by Belkin according to his personal notes but does not appear in his published list.

DISTRIBUTION. Treasury Is, Vella Lavella, Ranongga, Gizo I, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Malaita, San Cristobal, Santa Ana. Also Bougainville.

COLLECTION DETAILS. *Vella Lavella:* 17 & 18.XI.1963*, Pusisama, malaise trap, 2 ♀♀ (PS). *Ranongga:* 21.IV.1971*, Buri, freshwater pool, 2 L (T/W. 3). *Gizo Island:* 26.V.1972*, New Manda, freshwater taro swamp, 2 L (T/W. 11); 5.VI.1972, same locality, 3 L (T/W. 12). *Santa Isabel:* 1*, 2, 5, 7, 8 & 15.IX.1964, Tatamba, malaise trap, 0–50 m, 10 ♀♀, 3 ♂♂ (RS). *Russell Islands:* II.1970, Pavuvu I, Nukufero, details unknown, juv (MM.). *Florida Group:* 7.I.1970, Big Nggela, Vatupura, small muddy pool, juv (MM, 700107/4). *Guadalcanal:* 22, 23, 24, 25 & 27.V.1964, Tambalia, malaise trap, 6 ♀♀ (RS); 28.X.1968, Chimbu, Lake Vonu, ditch, juv (MM); 28.III.1970, Honiara, in house, 1 adult (T/0146); 17.V.1972, Rove Creek, Honiara, 1 L (T/G. 10); 3.XI.1972, Vatilau, Berande R, riverside pool, 7 L (T/G. 20). *Malaita:* 22.I.1969*, Takwa Mission, small stream, slow moving, shaded, juv (MM, 690122/1); 8.IV.1970, Niha R, Are Are, rock pool, juv (MM, 700408/1); 24.XI.1972, Tawanaora, streamside, shaded pool, 5 L, 2 P (T/Mala. 3), 1 ♀ (T/1007). *San Cristobal:* 16.VII.1971*, Kira Kira, pool nr road, 2 L (T/Mak. 19); 20.VII.1971, Kira Kira, wheel rut, exposed to sun, 1 L (T/Mak. 22); 13.VIII.1971, Manibwena, riverside pool, 6 L (T/Mak. 41); same data except stream, 5 L (T/Mak. 42); 14.VIII.1972, Manighari, Magoha R, riverside pool, mud bottom, dead leaves, 1 L (T/Mak. 68); 15.VIII.1972, Hao R, between Manikawa and Materato, riverside pool, dirty water, dead leaves, 2 L (T/Mak. 70); 16.VIII.1972, Hao R, upstream from Materato, dirty water under big rock, dead leaves, 2 L (T/Mak. 72); same data except resting on rock, 1 ♀ (T/0993); 21.VIII.1972, Magoha R, upstream from Manighari, riverside pool, dead leaves, 5 L (T/Mak. 74); Magoha R, between Manighari and Manibwena, pool with algal growth, 1 L (T/Mak. 75). *Santa Ana:* 29.IV.1971*, Lake Wairapa, lake edge, 1 L (T/Mak. 15).

Uranotaenia (Ura.) lateralis Ludlow, 1905

Ur. lateralis: Belkin, 1962: 170–72.

This species is widely distributed throughout the Indo-Malayan area. In the Solomons the immature stages have been found in pools of slightly brackish water immediately inland of the beach in open sunlit areas. Belkin found no published account of the adult habits and noted adults had never been collected in the Solomons. One of us collected adults resting by day in crabholes at the edge of mangrove pools.

DISTRIBUTION. New Georgia Gp., Guadalcanal, Florida Gp. Also New Guinea, Australia and Indo-Malayan area.

COLLECTION DETAILS. *Florida Group:* 10.VIII.1972*, Big Nggela, Boromole, day-resting in crabholes at edge of mangrove pools, 2 ♀♀ (T/0977-8).

Uranotaenia (Ura.) barnesi Belkin, 1953

Ur. barnesi: Belkin, 1962: 172–74.—Slooff, 1972: 177.—Maffi, 1973b: 44.—Taylor, 1973: 62.

This is a common and widely distributed species. It breeds principally in dense freshwater jungle swamps, also in small pools and, less frequently, in rockpools and sidepools of small, densely shaded jungle streams. The adults are attracted to lights but are not known to attack man. Larvae have been found infected with a *Coelomomyces* fungus (Maffi & Genga 1970). Belkin's personal records include a report of *Ur. barnesi* from the Florida Group, but this does not appear in his published list.

DISTRIBUTION. Choiseul, Gizo I, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Rennell, Malaita, San Cristobal. Also Bougainville, Santa Cruz Gp., New Hebrides.

COLLECTION DETAILS. *Gizo Island:* 26.V.1972*, New Manda, freshwater taro swamp, 1 L (T/W. 11); 5.VI.1972, same locality, 10 L (T/W. 12); 16.VI.1972, same locality, 2 L (T/W. 13). *Santa Isabel:* 1*, 2, 7 & 15.IX.1964, Tatamba, malaise trap, 0–50 m, 1 ♀, 3 ♂♂ (RS); 13.IV.1969, Susubona, taro swamp, juv (MM, 690413/2) included larva infected with *Coelomomyces* fungus. *Florida Group*: 3.VI.1969, Tulagi I, small, slow running

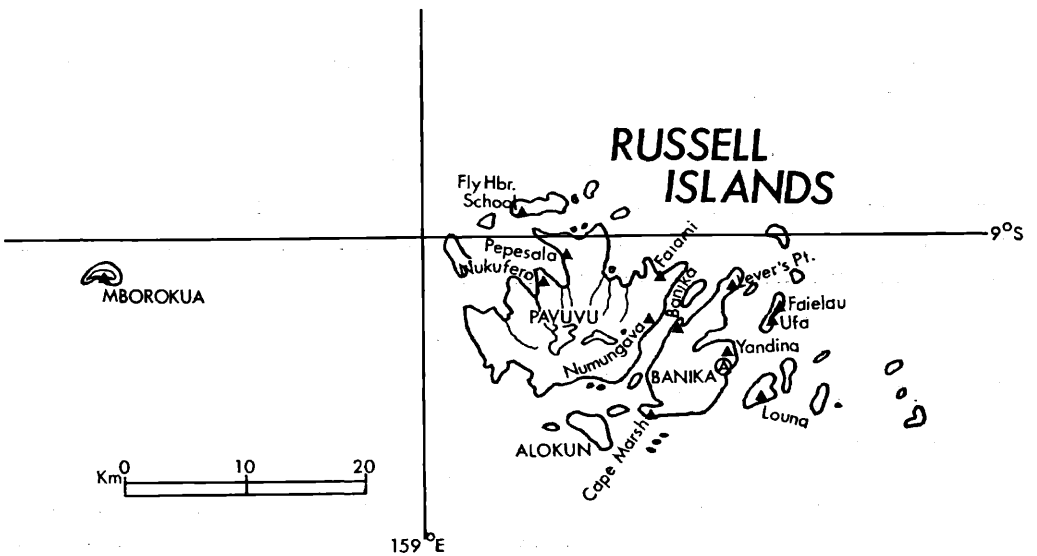

FIG. 6. Russell Islands and Mborokua (see FIG. 2 for key to symbols).

creek, semi-shade, debris, juv (MM). *Guadalcanal:* 8, 10, 17 & 18.V.1964, Roroni, malaise trap, 9 ♀♀ (RS); 27.V.1964, Tambalia, malaise trap, 1 ♀ (RS); I.1973, Honiara, in house at night, 1 ♀ (T/1033); 26.II.1973, same locality, 1 ♀ (T/1034). *Malaita:* 28.XI. 1972*, Tawairoi, E Are Are, ground pool, 4 L, 2 P (T/Mala. 17). *San Cristobal:* 21.VII. 1972*, Kira Kira, freshwater swamp, deep shade, 3 L (T/Mak. 56); 24.VII.1972, same locality, 5 L (T/Mak. 65).

Uranotaenia (Ura.) solomonis Belkin, 1953

Ur. solomonis: Belkin, 1962: 174–76.

According to Belkin (1962) this is the commonest ground pool-breeding *Uranotaenia* in the Solomons and it is usually found in rather open situations in temporary pools, ruts and springs, also in stagnant foul water and in tin cans. However, we made no collections of the juvenile stages. It is the commonest *Uranotaenia* in night hand catches in lighted quarters. The Russell Islands record is in Belkin's personal notes but not in his published list.

DISTRIBUTION. New Georgia Gp., Russell Is, Guadalcanal. Also Bougainville.

COLLECTION DETAILS. *Guadalcanal:* 21 & 24.V.1964, Tambalia, malaise trap, 2 ♀♀ (RS); 28.III.1970, Honiara, in house at night, 1 ♂, 2 ♀♀ (T/0143-5); 3.III.1971, same data, 1 ♀ (T/0367).

TRIBE CULICINI

Only 2 genera are recognized in the tribe Culicini: *Culex*, with a nearly worldwide distribution, and *Deinocerites*, which is confined to the Neotropical region.

GENUS **Culex** Linnaeus

Worldwide there are 15 subgenera of which 7 are represented in the South Pacific. Six subgenera are known from the Solomons.

SUBGENUS **Culex** Linnaeus

Belkin (1962: 184) recognizes some 21 species and forms, 3 of which are not named, from the South Pacific, but only 6 species are known from the Solomons. These fall into 2 groups, the *pipiens* group and the *sitiens* group.

PIPIENS GROUP

Culex (Cux.) quinquefasciatus Say, 1823

Cx. quinquefasciatus: Belkin, 1962: 195–97.

This is a ubiquitous species which is found throughout the tropics and subtropical areas. It is restricted mainly to domestic situations in the South Pacific especially breeding in foul ground pools, ditches and large artificial containers. It is a major pest in towns and it may transmit filariasis.

DISTRIBUTION. Treasury Is, Ranongga, Gizo I, New Georgia Gp., Russell Is, Florida Gp., Guadalcanal, Malaita, San Cristobal. Also Bougainville and throughout tropics and subtropics.

COLLECTION DETAILS. *Ranongga*: 20.IV.1971*, Buri, day-resting indoors, 2 ♀♀ (T/0440-1). *Gizo Island:* 11-18.VII.1964, Gizo town, adults in house and reared, 13 ♀♀, 2 ♂♂ (JS). *New Georgia Group*: 23.IV.1971, New Georgia I, Munda, night man-biting in house, 3 ♀♀ (T/0460-2); Sasavele I, Roviana, oil drum with rainwater, 2 L (T/W. 7), 2 ♂♂ (T/0464-5). *Russell Islands:* 17.VIII.1964, Pavuvu I, Pepesala, reared, 1 ♀ (RS); 24.II. 1970, Faielau, day indoor-resting, 2 ♀♀ (T/0112-3); Ufa I, day indoor-resting, 5 ♀♀ (T/0114-8); 24.IV.1970, Ufa I, cubic water tank, juv (MM); 25.II.1970, Banika I, Banika, day indoor-resting, 2 ♀♀ (T/0128-9). *Guadalcanal:* 22.V.1964, Tambalia, ? trapped, 1 ♀ (RS); 10.XI.1968, Honiara, foul water in canoe in hospital compound, juv (MM); 3.XI. 1969, Honiara, day-resting indoors, 1 ♂ (T/0002); 24.XI.1969; Honiara, Point Cruz, caught on board ships, 4 ♀♀ (T/0004-7); 13.I.1970, Honiara, in house, 4 ♀♀ (T/0027, T/0036-8); 8.III.1970, same locality, 1 ♀ (T/0140); 12.V.1971, Talaula, well, foul water, 8 L (T/G. 3). *Malaita:* 18.II.1970*, Rohinari, W Are Are, juv (MM, 700218). *San Cristobal:* 23.VII.1971*, Kira Kira, indoor day-resting, 5 ♀♀, 2 ♂♂ (T/0643-9); 8.VI.1972, Baunasughu, indoor day-resting, 1 ♀ (T/0861); 16.VI.1972, Arohane, outdoor-resting in bush, 4 ♀♀ (T/0865-8).

SITIENS GROUP

The group comprises 10 species in the South Pacific of which 5 are known from the Solomons.

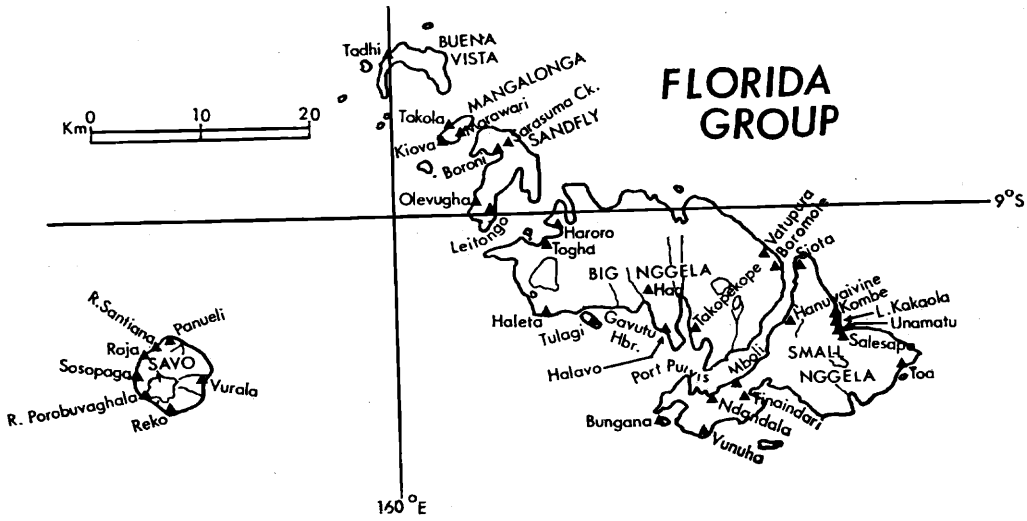

FIG. 7. Florida Group and Savo (see FIG. 2 for key to symbols).

Culex (Cux.) whittingtoni Belkin, 1962

Cx. whittingtoni Belkin: 1962: 204–05.—Slooff, 1972: 177, 180.

This is an uncommon species, which probably breeds in brackish water. Belkin recorded only 9 larvae from 2 collections. The adults are unknown.

DISTRIBUTION. Treasury Is, Choiseul, New Georgia Gp., Florida Gp.

COLLECTION DETAILS. *Florida Group:* 8.VI.1969*, Big Nggela, between Kaleston and Mereka, rock pool nr sea, juv (MM, 690608/2).

Culex (Cux.) sitiens Wiedemann, 1828

Cx. sitiens: Belkin, 1962: 205–07.—Slooff, 1972: 177.

This is a ubiquitous species, but, as it is primarily a brackish water breeder, it is never found far from the seacoast. It has been reported as a vicious biter in Fiji, but Belkin notes it is not known to attack man in the New Hebrides or the Solomons. We caught females man-biting at several places in the Solomons and at Santa Cruz.

DISTRIBUTION. Treasury Is, Choiseul, Vella Lavella, Kolombangara, New Georgia Gp., Russell Is, Florida Gp., Guadalcanal, Malaita, Ontong Java, San Cristobal, Ugi, Santa Ana. Also Bougainville and tropical and subtropical regions of the Old World.

COLLECTION DETAILS. *Vella Lavella:* 1.VII.1969*, Danbanito, small ground pool, juv (MM, 690701). *New Georgia Group:* 15.VII.1959, New Georgia I, Munda, biting, 2100 hr, 1 ♀ (JG); 27.IV.1971, New Georgia I, Seghe, reared, coconut with fresh water, in mangrove area, 1 ♂ (T/0473). *Russell Islands:* 25.II.1970, Pavuvu I, Fly Harbour School, small, brackish collection, juv (MM, 700225/2). *Florida Group:* 14.VIII.1969, Sandfly I, Olevugha, canoe, juv (MM, 690814/6); 9.VIII.1972, Big Nggela, Boromole, night man-biting, 2 ♀♀ (T/0975-6). *Malaita:* 25.VI.1964*, Dala, malaise trap, 1 ♀ (RS). *San Cristobal:* 9.III.1971*, Nukukaeisi, night man-biting, 1 ♀ (T/0394). *Ugi:* 2.VII.1971*, Ahia, surface pool, 4 L (T/Mak. 16). *Santa Ana:* 6.X.1970*, southwestern tip of island, shallow depressions on coral, rainwater, muddy bottom, 11 L, 22 P (MM, 701006/2), 3 ♀♀ (T/0370-2).

Culex (Cux.) annulirostris Skuse, 1889

Cx. annulirostris: Belkin, 1962: 207–10.—Slooff, 1972: 177.—Maffi, 1973b: 45.—Taylor, 1973: 62–63.

This is an extremely widely distributed species which is probably the commonest man-biting culicine in the Solomons and which may be involved in the transmission of filariasis. It can breed in almost any kind of water on the ground although it breeds primarily in freshwater pools and swamps and less frequently in large containers, such as canoes.

DISTRIBUTION. Treasury Is, Choiseul, Waghena, Gizo I, Kolombangara, New Georgia Gp., Russell Is, Florida Gp., Savo, Guadalcanal, Rennell, Malaita, Ontong Java, Sikaiana, San Cristobal, Ugi. Also Bougainville, Santa Cruz and throughout South Pacific, Indonesia and Philippines.

COLLECTION DETAILS. *Choiseul:* 19.II.1969, Susupo, swamp, juv (MM); 23.II.1969, Nuatambu, swamp, juv (MM); 21.III.1973, Moli Mission, lily pond, 5 L (T/W. 23). *Waghena:* 25.II.1969*, Nukumaroro, depression filled with rainwater, leaves, etc., juv

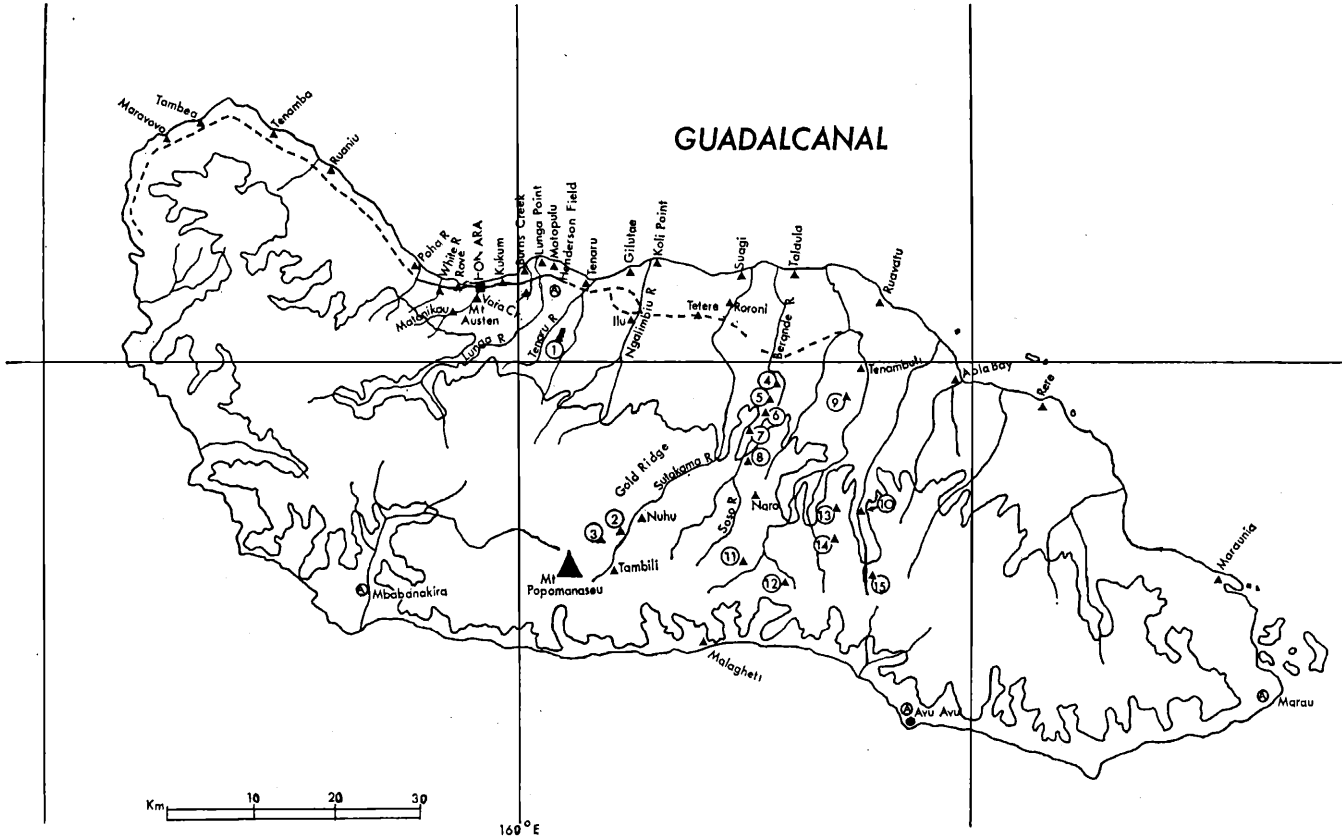

FIG. 8. Guadalcanal. Inland collecting areas are as follows: 1. Lake Nggiluvangga; 2. Valembaibai; 3. Babandeha; 4. Komukama; 5. Vatilau; 6. Dae Dae; 7. Tauvianguru; 8. Jeriko; 9. Paripao; 10. Bubunuhu; 11. Namunambosa; 12. Vungali; 13. Haishihinia; 14. Salamarao; 15. Lees Lake (Lake Vonu) (see FIG. 2 for key to symbols).

(MM). *Gizo Island:* 16.VI.1972*, New Manda, freshwater taro swamp, 3 L (T/W. 13). *Russell Islands:* 24.II.1970, Ufa I, cubic water tank, juv (MM, 700224/1), 2 adults (T/0132-3). *Florida Group:* 6.VI.1969, Small Nggela, Tinaindari School, ditch with grass, juv (MM, 690606/1); 11.VIII.1969, Olevugha I [Sandfly I], Boroni, abandoned well on seashore, juv (MM, 690811/3). *Savo:* 2.XII.1968*, R Lakevala nr Reko, blocked river mouth, juv (MM); same date, Surigama, seeping water pool, juv (MM); 5.XII.1968, Raja, seeping water pool, juv (MM). *Guadalcanal:* 28.X.1968, Chimbu, Lake Vonu, clear streamlet, juv (MM); 8.III.1970, Honiara, in house, 1 ♂, 2 ♀♀ (T/0137-9); 28.III. 1970, same locality, 1 ♀ (T/0142); 19.VI.1972, Ngalimbiu, oil palm plantation, stream pools, 3 L (T/G. 12); 27.VI.1972, Burns Creek swamp, inland King George VI School, 1 L (T/G. 15); 6.XI.1972, Matariu, Vara Creek, Kukum, 1 & p (T/G. 26) assoc. 1 ♂ (T/1000); 15.XI.1972, Turarana R, riverside pools, 2 L (T/G. 27); 6.II.1973, Dae Dae, Berande R, night man-biting, 1 ♀ (T/1027). *Malaita:* 9.IV.1970, Kiu, W Are Are, taro swamp, juv (MM, 700409/2); 17.II.1970, Rutaorea, juv (MM, 700217/1); same date, Hauporo, juv (MM, 700217/2); 28.XI.1972, Ainalato, W Are Are, surface pool, 5 L (T/Mala. 18). *Sikaiana:* VII.1971, night man-biting, 1 ♀ (T/0720). *San Cristobal:* 15.X. 1970*, Ngorangora airfield, rainpools, sunlit, 6 L (MM, 701015/4); 7.III.1971, Kira Kira, surface pool, 2 L, 1 P (T/Mak. 3); 11.III.1971, same locality, ground pool, 2 ♀♀, 3 ♂♂ (T/0408-12); same data except night man-biting, 1 ♀ (T/0400); 20.VII.1971, Manibwena, ground pool, exposed to sun, water hot, 1 L (T/Mak. 33); 12. IV. 1972, Arohane, ground pool, no vegetation, 2 L, 1 p (T/Mak. 48) assoc. ♂ (T/0842); 13.IV.1972, Kira Kira, wheel rut, exposed to sun, 1 L, 1 p (T/Mak. 47) assoc. ♀ (T/0845); 17.IV.1972, Arohane, surface pool, exposed to sun, 1 P (T/Mak. 54); same data except surface pool, grassy, 5 L, 1 p (T/Mak. 55); 6.VI.1972, same date, Arohane, outdoor day-resting, 2 ♀♀ (T/0857-8); 22.VII.1972, Baunasughu, ground pool, with algal scum, 8 L (T/Mak. 61); 24.VII.1972, Kira Kira, reared ?, 1 ♀ (T/0956). *Ugi:* 13.X.1970*, southwest coast, 800 m inland, small, muddy rainwater pools, in sun, 12 L (MM, 701013/5); 14.X.1970, Alangaula School, ditches around football field, muddy water, semi-shade, vertical vegetation, 2 L (MM, 701014/4).

Culex (Cux.) omani Belkin, 1962

Cx. omani Belkin, 1962: 210–11.

This is a rare species, apparently confined to Guadalcanal. Belkin records *Cx. omani* as breeding only in dense jungle swamps but our findings were from a more open situation at a lake edge.

DISTRIBUTION. Guadalcanal, not known elsewhere.

COLLECTION DETAILS. *Guadalcanal:* IV.1973, Lake Nggiluvangga, lake edge, 7 L (T/G. 33); 30.IV.1973, same locality, 1 L, 2 1 & p (T/G. 34) assoc. 2 ♀♀ (T/1097-8).

Culex (Cux.) squamosus Taylor, 1905

Cx. squamosus: Belkin, 1962: 214–15.

This is a fairly common and widely distributed species. Breeding is mainly in running fresh water, especially among filamentous algae.

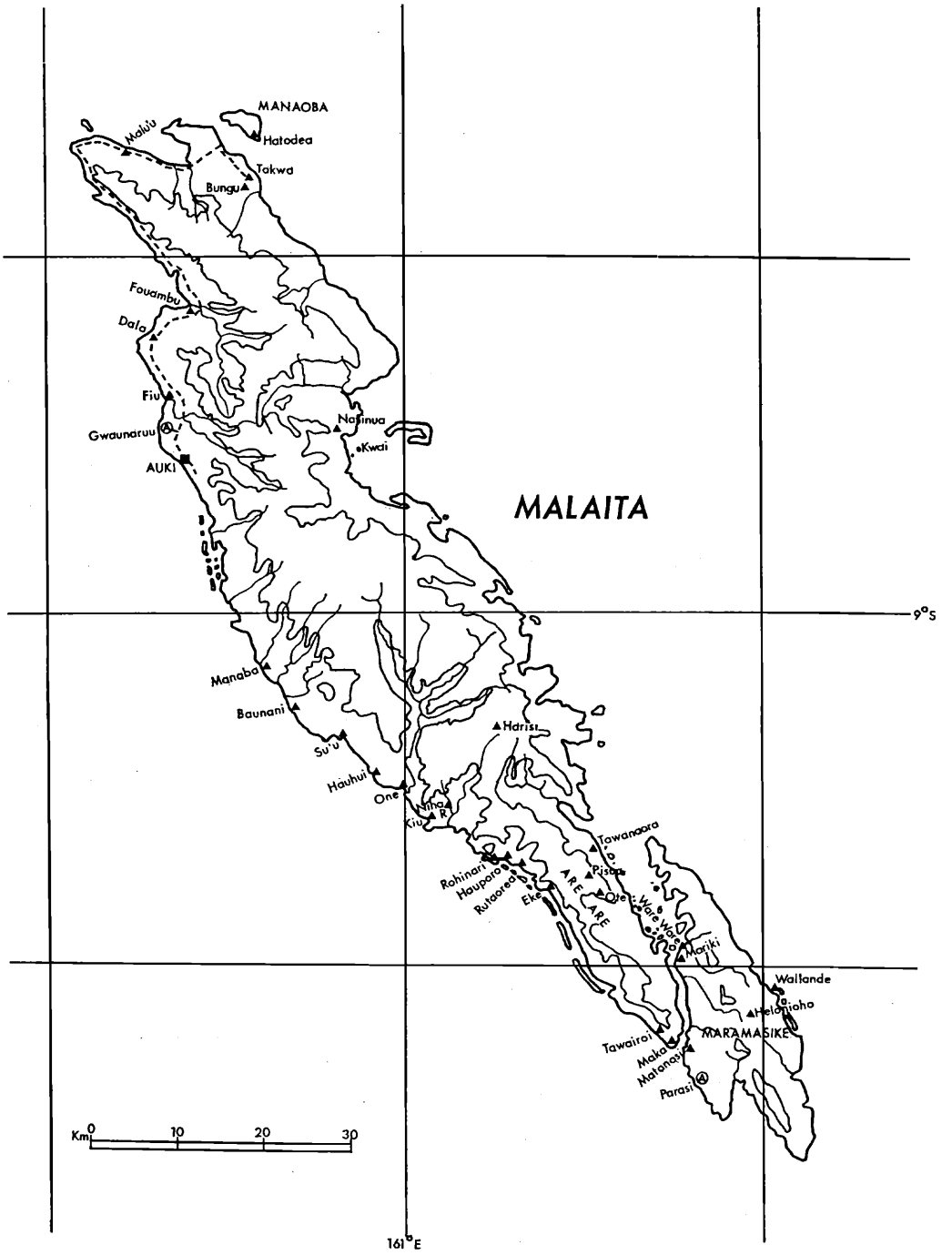

FIG. 9. Malaita (see FIG. 2 for key to symbols).

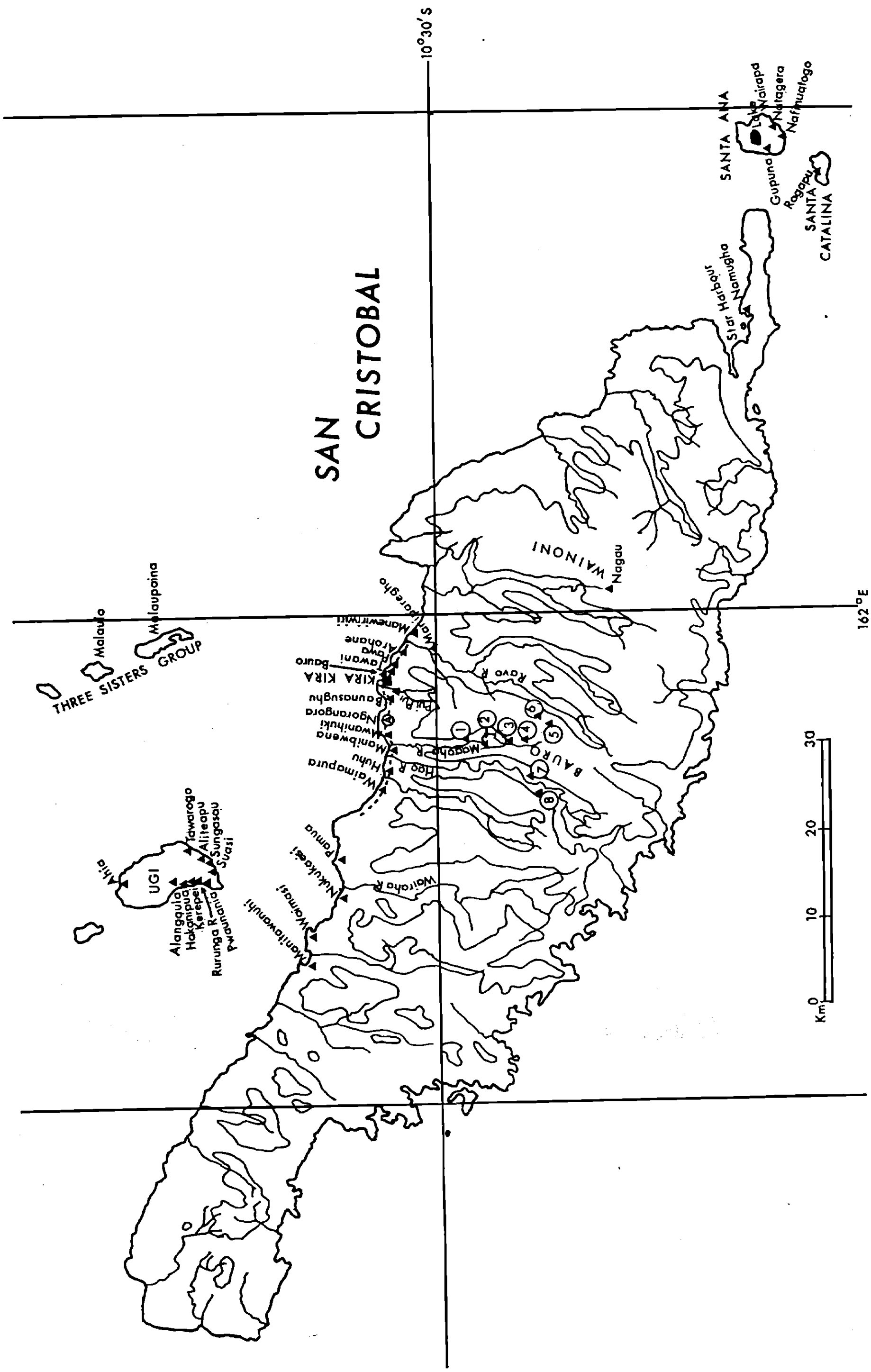

FIG. 10. San Cristobal and neighboring islands. Inland collecting areas are as follows: 1. Rauraha; 2. Manighari; 3. Rikiapu; 4. Vugiroga; 5. Maniate; 6. Oke Oke; 7. Manikawa; 8. Materato (see FIG. 2 for key to symbols).

DISTRIBUTION. Choiseul, Gizo I, New Georgia Gp., Russell Is, Guadalcanal, Rennell, Malaita, San Cristobal. Also Bougainville, New Guinea and Australia.

COLLECTION DETAILS. *Choiseul:* 19.II.1969*, Voza, stream, juv (MM). *Gizo Island:* 20.IV.1971*, Gizo town, stream, 2 ♂♂ (T/0444–15). *Guadalcanal:* 10.X.1968, Naro, clear, rocky stream, juv (MM); 28.X.1968, R Gurambusu, Lake Vonu, clear grassy streamlet, juv (MM); 29.X.1968, R Kolomakalivata, Nakambi-Salamarao, clear stream border pool, juv (MM); 14.XI.1968, White R, Honiara, still lateral pools, juv (MM); 12.VIII.1970, Nuhu, 1 L (MM, 700812); 16.VIII.1970, Babandeha, 2 L (MM, 700816); 30.VIII.1970, Tenaru R, Tenaru Falls area, 11 L, 10 P (MM, 700830/2, 3 & 4); 6.IX.1970, Matanikau R, 2 L, 2 P, 3 p (MM, 700906/6 & 7), 1 ♀ (T/0358); 13.V. 1971, Tenaru Sawmill, stream, 1 L (T/G. 5); 19.VI.1972, Ngalimbiu, stream pools, 2 L (T/G. 12); 6.VII.1972, Ruaniu Plantation, freshwater swamp, 1 P, 1 p (T/G. 17) assoc. ♀ (T/0899); 4.XI.1972, Dae Dae, Berande R, freshwater pool, shaded clay bottom, 3 L (T/G. 21); 5.XI.1972, Tauvianguru, Berande R, slowly moving stream, 2 L (T/G. 22); 6.XI.1972, Vara Cr, Matariu, Honiara, 1 p (T/G. 26) assoc. ♂ (T/0999); 15.XI.1972, Turarana R, riverside pools, 3 L (T/G. 27). *Malaita:* 9.IV.1970*, Eke Torrent, W Are Are, tree buttress, juv (MM, 700409/1). *San Cristobal:* 10.VIII.1971*, Arohane, fast-flowing stream, 14 L (T/Mak. 39).

SUBGENUS **Lutzia** Theobald

In the South Pacific the subgenus is found only in the Solomons where it is represented by a single species, *Cx. halifaxii*. Other species of the subgenus are known from the Old and New Worlds and primarily from the tropics.

Culex (**Lut.**) **halifaxii** Theobald, 1903

Cx. halifaxii: Belkin, 1962: 220–22.—Slooff, 1972: 177.

A widely distributed but not very common species. Breeds mainly in water rich in organic matter including ground pools, sago palm stumps and canoes. The larvae are carnivorous and include other mosquito larvae in their diet. The adults have been reported attacking man but this does not seem to be a common occurrence.

DISTRIBUTION. Treasury Is, Choiseul, Vella Lavella, Gizo I, New Georgia Gp., Rendova, Russell Is, Florida Gp., Guadalcanal, Bellona, Malaita, San Cristobal. Also Bougainville, New Guinea, Australia and SE Asia.

COLLECTION DETAILS. *Florida Group:* 14.VIII.1969*, Sandfly I, Olevugha, stagnant rainwater in sago palm stump, juv (MM, 690814/7); 15.VIII.1969, Sandfly I, Leitongo, sago palm stump, juv (MM, 690815/2); 5.I.1970, Big Nggela, Haleta, small muddy pool, juv (MM, 700105/1). *Malaita*: 25 & 30.VI.1964, Dala, malaise trap, 2 ♀♀ (RS); 17.II. 1970, Hauporo, ? ground pool, juv (MM, 700217/2); 28.XI.1972, Maka, pools in dry stream bed, 3 L (T/Mala. 14). *San Cristobal:* III.1971*, Kira Kira, rainwater in canoe, 1 L (T/Mak. 4); 22.VII.1971, Kira Kira, sago palm stump in deep shade in swamp, 1 L, 4l, 5 p (T/Mak. 29), 3 ♀♀, 4 ♂♂ (T/0625-31); 16.VIII.1972, Hao R, upstream from

Materato, 3 L (T/Mak. 71); 21.VIII.1972, Magoha R, between Manighari and Manibwena, stagnant pool with algal growth, 2 L (T/Mak. 75).

Subgenus **Acallyntrum** Stone & Penn

The subgenus *Acallyntrum* includes 5 species of which 2, *Cx. belkini* and *Cx. perkinsi*, are known from the Solomons; the other 3 are from New Guinea. The immature stages of *Acallyntrum* have been found only in the leaf axils of plants such as pandanus, taro and sago palms.

Culex (Acl.) belkini Stone & Penn, 1948

Cx. belkini: Belkin, 1962: 225.

This is a fairly uncommon species which breeds only in the leaf axils of pandanus. All known adults have been reared. Larvae of this species or of *Cx. perkinsi* were collected at Boromole, Big Nggela, Florida Gp., by one of us, but were subsequently lost before they were fully identified.

Distribution. Treasury Is, Shortland Is, New Georgia Gp., Rendova, Guadalcanal.

Collection details. *Shortland Islands:* 23.III.1973*, Samanagha I, axil of broadleaf pandanus, close to ground, 5 L (T/W. 25).

Culex (Acl.) perkinsi Stone & Penn, 1948

Cx. perkinsi: Belkin: 1962: 226-27.

This species breeds mainly in the leaf axils of pandanus, although it has been collected from the leaf axil of *Alocasia indica* (Laird 1956). Belkin notes it as a common species but we did not come across it.

Distribution. New Georgia Gp. (Arundel), Guadalcanal. Also Bougainville.

Collection details. No further specimens found.

Subgenus **Culiciomyia** Theobald

Culiciomyia is an Old World subgenus known primarily from the tropics. In the South Pacific the subgenus is represented by 3 species in the Solomons.

Culex (Cui.) papuensis (Taylor, 1914)

Cx. papuensis: Belkin, 1962: 230–31.

This is a relatively rare species in the Solomons where Belkin noted it breeding in large treeholes, artificial containers and ground pools.

Distribution. New Georgia Gp. (Ondanga), Guadalcanal, Malaita. Also Bougainville, New Guinea and ? New Britain.

Collection details. *Malaita:* 8*, 19, 25 & 30.VI.1964, Dala, malaise trap, 6 ♀♀ (RS).

Culex (Cui.) fragilis Ludlow, 1903

Cx. fragilis: Belkin: 1962: 231–32.—Taylor, 1973: 63.

This is a widely distributed but not very common species breeding primarily in small natural containers such as coconut shells. It has also been found in treeholes, sago and

pawpaw stumps and in ground pools, usually where the water contains much organic matter. The Gizo record is in Belkin's list and conspectus but it may be an error with the correct record being for *Cx. pullus* (collected by E. G. Sayers in 1930).

DISTRIBUTION. Vella Lavella, ? Gizo I, Kolombangara, New Georgia Gp., Rendova, Guadalcanal, Rennell, Malaita, San Cristobal. Also Bougainville, New Guinea and SE Asia.

COLLECTION DETAILS. *Vella Lavella:* 28.XI.1963*, Kow, 30 m, malaise trap, 1 ♀ (PS). *Kolombangara:* 13.II.1964, Pepele, 30 m, malaise trap, 1 ♀ (PS). *San Cristobal:* 22.VII. 1971*, Kira Kira, swamp area, resting over water in sago palm stump, deep shade, 1 ♀ (T/0620).

Culex (Cui.) pullus Theobald, 1905

Cx. pullus: Belkin, 1962: 232-34.—Slooff, 1972: 177.—Maffi, 1973b: 45.—Taylor, 1973: 63.

This is the commonest and most widely distributed member of the subgenus in the Solomons. Adults have been collected in nature, as well as in houses, but we have no records of the females attacking man. Breeding takes place primarily in water with a fairly high organic content both in ground pools and containers such as coconut husks, shells and spathes and large treeholes. The Gizo record is in Belkin's personal notes but not in his published list (see note for *Cx. fragilis*).

DISTRIBUTION. Treasury Is, Choiseul, Waghena, Vella Lavella, Gizo I, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Savo, Guadalcanal, Rennell, Malaita, San Cristobal, Ugi. Also Bougainville, New Guinea, Australia (Queensland) and the Moluccas.

COLLECTION DETAILS. *Waghena:* 25.II.1969*, Nukumaroro, depression filled with rainwater and leaves, juv (MM). *Vella Lavella:* 17.XI.1963*, Gingola, 60 m, ? trapped, 1 ♀ (PS); 21.XII.1964, Ulo Crater, 10 m, malaise trap, 1 ♀ (PS). *Santa Isabel:* 1.IX. 1964*, Tatamba, 0–50 m, malaise trap, 1 ♀ (RS). *Russell Islands:* 17.VII.1964, Pavuvu I, Pepesala, emerged, 1 ♀ (RS). *Florida Group:* 14.VIII.1969, Sandfly I, Olevugha, sago palm stump in forest garden, juv (MM, 690814/7). *Savo:* 15.XII.1969*, Vurala, details not recorded, juv (MM). *Guadalcanal:* 8.V.1964, Roroni, ? trapped, 1 ♀ (RS); 13.XI. 1968, Honiara, Fishing Vill., rubber tire, juv (MM); 3.XI.1969, Honiara, day-resting in office, 1 ♀ (T/0001); 3.XI.1972, Vatilau, Berande R, riverside pool, 3 L (T/G. 20); 15.XI.1972, Turarana R, riverside pool, 1 L (T/G. 27). *Malaita:* 23.III.1969*, Maramasike I, Wallande School, small creek, juv (MM, 690323/2). *San Cristobal:* 7.XI.1964*, Kira Kira, 0–200 m, malaise trap, 1 ♀ (RS); 15.XI.1964, Kira Kira, 0–50 m, malaise trap, 1 ♀ (RS); 20.VII.1971, same locality, indoor day-resting, 1 ♀ (T/0621); 22.VII.1971, same locality, coconut spathe, rainwater and debris, 1 L (T/Mak. 25); 21.VIII.1972, Magoha R, between Manighari and Manibwena, stagnant pool with algal growth, 4 L (T/Mak. 75). *Ugi:* 13.X.1970*, SW coast, 800 m inland on tilled field, small rainwater pools in the sun, 2 L (MM, 701013/5).

Subgenus **Neoculex** Dyar, 1905

A predominantly Old World genus with several representatives in the Nearctic region. In the South Pacific there are at least 4 species on New Caledonia and 1 species in the Solomons. Sirivanakarn (1971) placed *Cx. leonardi* in the *crassistylus* group which includes 2 species from New Guinea. The other South Pacific species are all in the *pseudomelanoconia* group.

Culex (**Ncx.**) **leonardi** Belkin, 1962

Cx. leonardi Belkin, 1962: 245–47.

This species has been recorded only from a few collections in dense jungle swamps. The new record from San Cristobal is a single malaise-trapped female and the identification may be incorrect.

Distribution. Guadalcanal, ? San Cristobal. Also Bougainville.

Collection details. *San Cristobal:* 20.XI.1964*, Kira Kira, 0–50 m, malaise trap, 1 ♀ (RS).

Subgenus **Lophoceraomyia** Theobald

Lophoceraomyia is an incompletely known and poorly understood subgenus which is particularly prone to speciation and is probably still evolving. It is confined to the Old World and is predominantly Oriental, Indomalayan and Australasian in distribution. In the South Pacific Belkin (1962: 250) considered there are at least 23 distinct forms and suspected there are many additional species to be recognized. These forms are known only from the Solomons, Santa Cruz Islands, New Hebrides and the Belep group. Sirivanakarn's monograph (1968) on New Guinea *Lophoceraomyia* is of little assistance in studying Solomons species but further underlines the high degree of speciation.

In the Solomons there are at least 4 complexes of species (the *fraudatrix* complex, the *bergi* complex, the *solomonis* complex and the *hurlbuti* complex) and our further collections indicate that Belkin sp. 21 Guadalcanal form may belong to a 5th complex.

Fraudatrix complex

The *fraudatrix* complex (Sirivanakarn 1968: 155–56) includes the *buxtoni* complex established by Belkin (1962: 250) for the South Pacific species. There are 7 species known from New Guinea, 1 of which (*Cx. atracus*) is also known from the Solomons. The others from the South Pacific are *Cx. buxtoni* from the New Hebrides, *Cx. lairdi* from the Solomons and Belkin sp. 23 Rennell form from Rennell and Bellona. The last may in fact be 3 distinct forms. The members are primarily ground pool forms although the sp. 23 has been recorded in treeholes and containers where there were no ground pools.

Culex (**Lop.**) **atracus** Colless, 1959

Cx. franclemonti: Belkin, 1962: 256–57.

Cx. atracus and synonomy with *Cx. franclemonti* of Sirivanakarn, 1968: 161–63.

It is relatively uncommon and is found breeding in dense jungle swamps, particularly in swamp pools and occasionally in stream margin pools.

DISTRIBUTION. Choiseul, New Georgia Gp., Guadalcanal, San Cristobal. Also Bougainville.

COLLECTION DETAILS. *Choiseul:* 20.III.1973*, Poro Poro, freshwater pool in bomb crater, deep shade, 1 L (T/W. 16). *San Cristobal:* 13.VIII.1974*, Manibwena, riverside pool, 1 L (T/Mak. 41).

Culex (Lop.) lairdi Belkin, 1962

Cx. lairdi Belkin, 1962: 257-58.—Slooff, 1972: 177.

This is a fairly common species whose adults have been collected in outdoor-resting searches. Breeding is chiefly in jungle swamps but also in streams and occasionally in small ground pools.

DISTRIBUTION. Choiseul, Gizo I, New Georgia Gp., Santa Isabel, Russell Is, Guadalcanal, San Cristobal, Santa Ana.

COLLECTION DETAILS. *Choiseul:* 19.II.1969, Papara, creek, grassy, juv (MM). *Gizo Island:* 26.V.1972*, New Manda, taro swamp, 1 P (T/W. 11). *Santa Isabel:* 13.IV.1969*, Susubona, taro swamp, juv (MM, 690413/2). *Russell Islands:* 25.VII.1970, Banika I, Banika, resting in house by day, 1 ♀ (T/0122); same date, Banika I, Yandina, indoor-resting by day, 3 ♀♀ (T/0125-7). *Guadalcanal:* 21.VI.1972, Honiara, indoor-resting by day, 1 ♀ (T/0891). *San Cristobal:* 13.VIII.1971*, Huhu, wheelrut, 1 L (T/Mak. 40); same date, Manibwena, stream, 1 L (T/Mak. 42); 25.VII.1972, Arohane, outdoor day-resting, 5 ♀♀, 9 ♂♂ (T/0928-41). *Santa Ana:* 29.IV.1971*, Lake Wairapa, lake edge, 1 L (T/Mak. 15).

Culex (Lop.) Belkin sp. 23 Rennell forms

Cx. (Lop.) sp. 23 of Belkin, 1962: 272—.Maffi, 1973b: 45.—Taylor, 1973: 63.

A total of 25 larvae from Rennell were recognized by Belkin (1962) as showing differences from the other members of the *buxtoni* complex. We have collected a good deal of extra material from Rennell and Bellona but apart from noting (Taylor 1973: 63) that perhaps 3 distinct species are involved we have not reached any firm conclusions. Specimens collected at Kangava, Rennell, were found to be infected by a *Coelomomyces* fungus (Maffi & Genga 1970). It is the only member of the complex recorded from containers, both natural and artificial, as well as from ground pools.

DISTRIBUTION. Rennell and Bellona.

BERGI COMPLEX

The *bergi* complex (Belkin 1962: 250) comprises *Cx. bergi, Cx. oweni, Cx. winkleri, Cx. laffooni* and probably Belkin sp. 16 and Belkin sp. 18. All of these are known mainly from rock pools except sp. 16 which is from a riverside aroid.

Culex (Lop.) bergi Belkin, 1962

Cx. bergi Belkin, 1962: 258-59.

This species was previously recorded by Belkin only from Guadalcanal where it was found breeding in rock pools and pools in blocked streambeds a considerable distance from the coast. Our collections are similarly from well inland.

DISTRIBUTION. Guadalcanal, Malaita, San Cristobal.

COLLECTION DETAILS. *Guadalcanal:* 28.X.1968, Chimbu, Lake Vonu, small collection of still, foul water, juv (MM); 8.XI.1972, Jeriko, Berande R, riverside pools, 6 L (T/G. 23). *Malaita:* 8.II.1970*, Hauporo, W Are Are, details unknown, juv (MM, 700208); 8.IV.1970, Niha R, W Are Are, rock pool, juv (MM, 700408/1). *Sans Cristobal:* 2.X.1970*, Magoha R, Rauraha, small semi-shaded water collection on sandy, muddy riverbank, 1 L (MM, 701002/3); same date, Magoha R, below Rikiapu, rock pool, sunny with dead leaves, 1 L (MM, 701002/4).

Culex (Lop.) oweni Belkin, 1962

Cx. oweni Belkin, 1962: 259–60.

Belkin recorded this species only from Guadalcanal where, like *Cx. bergi*, it was found breeding in rockholes and in pools in rocky streambeds usually a considerable distance from the coast. Our findings are similar and include the first collection of an adult female in the field.

DISTRIBUTION. Guadalcanal, ? Florida Gp., San Cristobal.

COLLECTION DETAILS. *Florida Group:* 6.I.1970*, Small Nggela, Ndandala, rockholes in Kuragova Creek, 6 L (MM, 700106/5), 3 L (MM, 700106/6)—these may be Belkin *Lophoceraomyia* sp. 18. *San Cristobal:* 15.VIII.1972*, Hao R, between Manikawa and Materato, stagnant riverside pool, dirty water, dead leaves, 7 L (T/Mak. 70); 16.VIII. 1970, Hao R, resting on rock, 1 ♀ (T/0994); 19.VIII.1972, between Maniate and Oke Oke, stagnant water on stone, full of dead leaves, 7 L (T/Mak. 73); 21.VIII.1972, Magoha R, between Manighari and Manibwena, stagnant pool with algal growth, 3 L (T/Mak. 75).

Culex (Lop.) winkleri Belkin, 1962

Cx. winkleri Belkin, 1962: 260–61.

This is a rare species which was previously known only from 2 collections on Guadalcanal. Both collection sites were fairly well inland, one being a rockhole and the other in a streambed. Our collections were made by E. S. Horoto from rock pools a considerable distance inland on San Cristobal.

DISTRIBUTION. Guadalcanal, San Cristobal.

COLLECTION DETAILS. *San Cristobal:* 16.VIII.1972*, Hao R, upstream from Materato, rock pool, clear water, dead leaves, 6 L (T/Mak. 71); 19.VIII.1972, between Maniate and Oke Oke, stagnant water on stone, full of dead leaves, 1 L (T/Mak. 75); 21.VIII. 1972, Magoha R, between Manighari and Manibwena, stagnant pool with algal growth, 4 L (T/Mak. 75).

Culex (Lop.) laffooni Belkin, 1962

Cx. laffooni Belkin, 1962: 261–62.

This species was previously known only from 2 collections, in rock crevices and a stream, both at Halavo in the Florida Gp. Our records are a further collection from the Florida Gp. and collections from Guadalcanal and Simbo. The Simbo collection shows that the rock pool *Lophoceraomyia* may be much more widespread than previously indicated.

DISTRIBUTION, Simbo, Florida Gp., Guadalcanal.

COLLECTION DETAILS. *Simbo:* 8.VII.1969*, Malalomo, small collection in forested area, 300 m from shore in clay crater of fallen tree, juv (MM, 690708). *Florida Group:* 6.I.1970, Small Nggela, Ndandala, rockholes in Kuragova Creek, L, P (MM, 700106/2, 3 & 4). The pupal identification is uncertain as this stage has not been described. *Guadalcanal:* 24.X.1968*, Namunambosa, R Manugogo, rockholes, sunny with dead leaves, juv (MM).

Culex (Lop.) Belkin sp. 16 Solomons aroid form

Cx. (Lop.) sp. 16 of Belkin, 1962: 270.

This form is represented by a single male reared from the leaf axil of an aroid growing in dense shade along the Matanikau River, Guadalcanal.

DISTRIBUTION. Guadalcanal.

Culex (Lop.) Belkin sp. 18 Solomons rock pool forms

Cx. (Lop.) sp. 18 of Belkin, 1962: 270–71.

The larvae are similar to *Cx. oweni* and the associated pupae also resemble the *bergi* complex. In the absence of individual rearings the identification cannot be resolved. Larvae collected by us in the Florida Group and identified as *Cx. oweni* may in fact be of this form.

DISTRIBUTION. New Georgia Gp. (Sasavele I) and Florida Gp. Also Bougainville.

SOLOMONIS COMPLEX

The *solomonis* complex (Belkin 1962: 250, Sirivanakarn 1968: 175) comprises *Cx. solomonis, Cx. walukasi, Cx. becki* and Belkin sp. 17, 19 and 20, all from the Solomons (sp. 20 from Bougainville only) and *Cx. durhami* from New Guinea. Both ground pools, by *Cx. solomonis, Cx. becki* (restricted to crabholes) and sp. 17, and containers, by *Cx. walukasi*, sp, 19 and sp. 20, are used as breeding sites.

Culex (Lop.) solomonis Edwards, 1929

Cx. solomonis: Belkin, 1962: 262–64.—Sirivanakarn, 1968: 175–77; 1973: 215.

This species is the dominant and probably the most plastic and adaptable form of *Lophoceraomyia* in the Solomons. The immature stages have been found in all types of ground water habitats, from permanent jungle swamps to stream margins and temporary pools. Belkin included all questionable material from ground pools and we have followed that policy.

DISTRIBUTION. Treasury Is, Choiseul, Simbo, Kolombangara, New Georgia Gp., Rendova, Florida Gp., Savo, Guadalcanal, Malaita, San Cristobal, Ugi, Santa Ana. Also Bougainville, New Guinea and Moluccas.

COLLECTION DETAILS. *Choiseul:* 23.II.1969*, Pangoe, river, grassy banks, juv (MM); 20.III.1973, Poro Poro, freshwater pool in bomb crater, deep shade, 1 P, 1 p (T/W. 16) assoc. ♀ (T/1050). *Simbo:* 8.VII.1969*, Malalomo, small water collection in forested area, 300 m from shore in clay crater of fallen tree, juv (MM, 690708). *Florida Group:* 6.VI.1969, Small Nggela, Ndandala, rockhole in cascading stream, juv (MM, 690606/2); 10.VI.1969, Small Nggela, Uvumatu, pit in clay mud, juv. (MM, 690610/4); 12.VIII. 1969, Sandfly I, Boroni, brackish, abandoned well on shore, juv. (MM, 690812/3); 5.I. 1970, Big Nggela, Haleta, small, muddy pool, juv (MM, 700105/1); 7.I.1970, Big Nggela, Vatupura, small muddy pool, juv (MM, 700107/4). *Savo:* 30.XI.1968*, R Santiana, upstream, rainwater in rockhole, juv (MM); 4.XII.1968, R Pogorobuvaghala in forest, small rainwater collection, juv (MM). *Guadalcanal:* 28.X.1968, Chimbu, Lake Vonu, ditch, juv (MM); 17.V.1972, Rove Creek, Honiara, 2 L (T/G. 10); 3.XI.1972, Vatilau, Berande R, riverside pool, **2** L (T/G. 20); 8.XI.1972, Jeriko, Berande R, riverside pool, 2 L (T/G. 23). *Malaita:* 22.I.1969, Takwa, river, juv (MM, 690122/1); 27.I.1969, Bungu, freshwater source, juv (MM, 690127/1); 25.III.1969, Ware Ware, Maramasike I, rainpool in grass, muddy, P (MM, 690325/1); Helanioho, cascading stream, juv (MM, 690325/2); 8.II.1970, Hauporo, W Are Are, juv (MM, 700208); 8.IV.1970, Niha R, W Are Are, rock pool, juv (MM, 700408/1); 28.XI.1972, Maka, S Are Are, pools in dry streambed, 2 L (T/Mala. 14). *San Cristobal:* 2.X.1970*, Magoha R, 5 km inland, rock pools along riverbank, 4 P (MM, 701002/1); same date, Magoha R, below Rikiapu, rock pool, sunny, with dead leaves, several L (MM, 701002/4); 3.X.1970, same locality, below Vugiroga, rock pool, 5 L, 1 P (MM, 701003/2); 20.VII.1971, Kira Kira, shaded wheel rut, 5 L, 1 P (T/Mak. 20); same locality, wheel rut, grassy, semi-shade, 2 L (T/Mak. 21); 20.VII.1971, Manibwena, wheel rut, semi-shade, 3 L (T/Mak. 35); 22.VII.1971, Kira Kira, Pui Pui R, riverside pool, 4 1 (T/Mak. 24); 23.VII.1971, Kira Kira, farm, roadside pool, 3 1, 2 p (T/Mak. 31); same date, Pui Pui R, riverside pool, 4 L, 6 p (T/Mak. 38) assoc. 3 ♀♀, 3 ♂♂ (T/0637-42); 13.VIII.1971, Huhu, wheel rut, 12 L (T/Mak. 40); same date, Manibwena, riverside pool, 6 L (T/Mak. 41); same data except stream, 3 L (T/Mak. 42); 13.IV.1972, Kira Kira, shaded wheel rut, 4 L, 2 P (T/Mak. 46); same data except wheel ruts, exposed to sun, 1 (T/Mak. 47); 15.VIII.1972, Hao R, nr Manikawa, riverside pool, dirty water, dead leaves, 1 L (T/Mak. 69); same data except between Manikawa and Materato, riverside pool, dirty water, dead leaves, 7 L (T/ Mak. 70); 16.VIII.1972, upstream from Materato, dirty water under big rock, dead leaves, 7 L (T/Mak. 72); 21.VIII.1972, Magoha R, upstream from Manighari, riverside pool, dead leaves, 6 L (T/Mak. 74); same data except between Manighari and Manibwena, still pool with algal growth, 2 L (T/Mak. 75). *Ugi:* 14.X.1970*, Alangaula School, ditches around football field, muddy water, semi-shade, vertical vegetation, 1 L (MM, 701014/4). *Santa Ana:* 8.X.1970*, Gupuna, stone-walled well, clean water, leaves on bottom, 2 L, 1P (MM, 701008/1).

Culex (Lop.) walukasi Belkin, 1962

Cx. walukasi Belkin, 1962: 264-65.—Slooff, 1972:177.

This is the main treehole-breeding *Lophoceraomyia* in the Solomons. It is also found in coconuts, tree stumps and similar water collections.

DISTRIBUTION. Choiseul, New Georgia Gp., Russell Is, Florida Gp., Guadalcanal, San Cristobal, Ugi. Also Bougainville.

COLLECTION DETAILS. *Florida Group:* 14.VIII.1969, Sandfly I, Olevugha, sago palm stump in garden, stagnant water, juv (MM, 690814/7); 15.VIII.1969, Sandfly I, Leitongo, sago palm stump in garden, juv (MM, 690815/2); 9.VIII.1972, Big Nggela, Boromole, coconut, semi-foul water, 7 L (T/Ng. 2). *San Cristobal:* 21.VII.1972*, Kira Kira, sago palm stump in swamp, 2 p (T/Mak. 58) assoc. 2 ♀♀ (T/0908-9); 23.VII. 1972, Tawani, cleft on tree root, shore area, 1 p (T/Mak. 64) assoc. ♀ (T/0923). *Ugi:* 4.VII.1971*, Pwaunania, treehole, dirty water, 1 L (T/Mak. 17).

Culex (Lop.) becki Belkin, 1962

Cx. becki Belkin, 1962: 265-66.

This is a rare species whose immature stages are known principally from crabholes in association with *Aedes (Geo.) longiforceps.*

DISTRIBUTION. New Georgia Gp., Santa Isabel, Guadalcanal.

COLLECTION DETAILS. *Santa Isabel:* 13.IV.1969*, Susubona, taro swamp, juv (MM, 690413/2).

Culex (Lop.) Belkin sp. 17 Solomons ground forms

Cx. (Lop.) sp. 17 of Belkin, 1962: 270.

The larvae of this form are similar to *Cx. walukasi* but the pupae have *Cx. solomonis* characteristics and the form is found in ground pools. A lack of individual rearings has precluded precise identification.

DISTRIBUTION. New Georgia Gp., Rendova and Guadalcanal. Also Bougainville.

Culex (Lop.) Belkin sp. 19 Solomons treehole forms

Cx. (Lop.) sp. 19 of Belkin, 1962: 271.

Apparently this form is intermediate in its characteristics between *Cx. solomonis* and *Cx. walukasi.* The immature stages have been collected from treeholes, coconut shells and artificial containers.

DISTRIBUTION. Florida Gp., Guadalcanal and San Cristobal. Also Bougainville.

COLLECTION DETAILS. *San Cristobal:* 22.VII.1971*, Kira Kira, large sago palm stump in deep shade in swamp, 1 L (T/Mak. 29); 25.IX.1972, Tawani, treehole, 8 L (T/Mak. 76).

HURLBUTI COMPLEX

The *hurlbuti* complex (Belkin 1962: 250, Sirivanakarn 1968: 177) comprises *Cx. hurlbuti* from the Solomons and New Ireland and *Cx. perryi* and Belkin sp. 22 from the Solomons. All 3 members breed solely in the leaf axils of various pandanus species.

Culex (Lop.) hurlbuti Belkin, 1962

Cx. hurlbuti Belkin, 1962: 266–68.—Sirivanakarn, 1968: 177–78.

This rare species is known only from 4 collections from pandanus leaf axils on Guadalcanal and a few collections elsewhere.

DISTRIBUTION. Guadalcanal. Also Bougainville and New Ireland.

COLLECTION DETAILS. No new collections made.

Culex (Lop.) perryi Belkin, 1962

Cx. perryi Belkin, 1962: 268–69.

This species was previously known only from 2 collections from leaf axils of a typical pandanus in partial shade in the jungle in the Balasuna-Nalimbiu area of Guadalcanal. but is now known to be widely distributed, probably throughout the Solomons.

DISTRIBUTION. Shortland Is, Choiseul, Guadalcanal, Malaita, San Cristobal.

COLLECTION DETAILS. *Shortland Islands:* 22.III.1973*, Samanagha I, leaf axil, broadleaf pandanus, close to ground, 1 p (T/W. 25) assoc. ♀ (T/1070), also slides with 2 p and adult ♀ and ♂ (T/W. 25). *Choiseul:* 20.III.1973*, Poro Poro, broadleaf pandanus axil, 1 ♀ (T/1052), possibly *Cx. hurlbuti*. *Malaita:* 28.XI.1972*, Maka, S Are Are, axil, very large broadleaf pandanus, 1 L (T/Mala. 12). *San Cristobal:* 22.VII.1971*, Kira Kira, pandanus axil, 2 m above ground, 3 L (T/Mak. 28); resting over water in sago palm stump, deep shade in swamp, 1 ♀ (T/0620); 21.VII.1972, Kira Kira, swamp area, axil, narrow-leaf pandanus, 1 to 2 m above ground, 3 L (T/Mak. 59).

Culex (Lop.) Belkin sp. 22 New Georgia pandanus forms

Cx. (Lop.) sp. 22 of Belkin, 1962: 271–72.

Belkin included at least 2 forms of which specimens had been collected on Sasavele I and at Seghe in the New Georgia Group and on Rendova. All the material, 6 collections. came from pandanus leaf axils, but there are differences in the larvae and adults from both *Cx. hurlbuti* and *Cx. perryi*. One of us collected specimens from a pandanus axil at Boromole in the Florida Group which show differences from both *Cx. hurlbuti* and *Cx. perryi*.

DISTRIBUTION. New Georgia Gp., Rendova and Florida Gp.

COLLECTION DETAILS. *Florida Group:* 8.VIII.1972*, Big Nggela, Boromole, axil of broadleaf pandanus, on foreshore, 1 L, 1 l and p (T/Ng. 3a) indiv. reared ♂ (T/0989).

UNDETERMINED COMPLEX

Specimens of an undescribed form which we have included with Belkin sp. 21 Guadalcanal form are so distinctive that we prefer not to ascribe them to 1 of the other 4 complexes.

Culex (Lop.) Belkin sp. 21 Guadalcanal form

Cx. (Lop.) sp. 21 of Belkin, 1962: 271.

Belkin describes a single ♂ captured on the moist, rocky bank of a Guadalcanal stream as having genitalia similar to *Cx. winkleri* but quite different antennal characters. A series

of larval collections was made by one of us at Lake Nggiluvangga on Guadalcanal and individual rearings indicate a new species. The overall characteristics are perhaps nearest to the *hilli* and *petersi* complexes described by Sirivanakarn (1968) from New Guinea. The adults are similar in some characters to the *bergi* complex but the larvae are dissimilar to all Solomons species.

DISTRIBUTION. Guadalcanal.

COLLECTION DETAILS. *Guadalcanal:* 15.V.1972*, Lake Nggiluvangga, lakeside, 5 L (T/G. 9); 3.VII.1972, same locality, 5 L, 2 p (T/G. 16) assoc. 2 ♂♂ (T/0892-3); 17.VII.1972, same locality, 3 L (T/G. 18) indiv. rearings 1 & p (T/G. 18a) assoc. ♂ (T/0901), 1 & p (T/G. 18b) assoc. ♀ (T/0902) and 1 & p (T/G. 18c) assoc. ♀ (T/0903).

TRIBE AEDEOMYIINI

The tribe Aedeomyiini comprises a single genus, *Aedeomyia*.

GENUS **Aedeomyia** Theobald

In his review of the genus, Tyson (1970) recognized 6 species in 2 subgenera, *Aedeomyia* and *Lepiothauma*.

SUBGENUS **Aedeomyia** Theobald

The subgenus, which is pantropic, comprises 5 species. In the South Pacific the species *A. catasticta* is known from Fiji and the Solomons.

Aedeomyia (Ady.) catasticta Knab, 1909

Ad. catasticta: Belkin, 1962: 276-77.

This is the only member of the tribe known from the Solomons. Few collections have been made and it is not a common species. On Guadalcanal the only collection was in a small coastal lagoon at Koli where the larvae were anchored in masses of algae within dense vegetation.

DISTRIBUTION. Kolombangara, Russell Is, Guadalcanal. Also Bougainville, New Guinea, Fiji, Northern Australia, Micronesia and the Indomalayan region.

COLLECTION DETAILS. *Russell Islands:* 23.II.1970, Banika I, large, shallow, exposed surface pool with algal masses, fragmentary larvae (MM.).

TRIBE HODGESIINI

The tribe is composed of a single genus, *Hodgesia*.

GENUS **Hodgesia** Theobald

Hodgesia is confined to the Old World tropics with some 12 or so species within the genus, 1 of which is found in the Solomons. All the members of the genus are tiny mosquitoes whose immature stages are usually found in swamps and marshes.

Hodgesia solomonis Belkin, 1962

Ho. solomonis Belkin, 1962: 280-81.

The immature stages have most frequently been found in small pockets of water at the edges of dense jungle swamps. The females are vicious man-biters but only in the close vicinity of the breeding areas and in broad sunlight.

DISTRIBUTION. Russell Is, Guadalcanal. Also Bougainville.

COLLECTION DETAILS. *Russell Islands:* 20.VII.1964*, Pavuvu I, Pepesala, 0-100 m, malaise trap, 1 ♀ (RS). *Guadalcanal:* 1.V.1972, Lake Nggiluvangga, lake edge, 1 L (T/G. 8); 26.IV.1973, Burns Creek, swamp inland of King George VI School, Honiara, day man-biting, 5 ♀♀ (T/1071-5); 30.IV.1973, Lake Nggiluvangga, day man-biting, 3 ♀♀ (T/1094-6).

TRIBE FICALBIINI

The tribe Ficalbiini is composed of a single genus, *Ficalbia*, which is known only from the Old World where it is largely confined to the tropics. Four subgenera have been described but only 2 of these, *Etorleptiomyia* and *Mimomyia*, are known from the South Pacific. The subgenus *Etorleptiomyia* is represented by 2 species, *Fi. solomonis* from the Solomons and Bougainville and *Fi. bougainvillensis* from Bougainville. The subgenus *Mimomyia* is represented by a single species, *Fi. gurneyi* from Bougainville.

Mattingly (1971: 30) has proposed that *Mimomyia* should be raised to genus status with 3 subgenera, *Mimomyia*, *Etorleptiomyia* and *Ravenalites*. *Ficalbia* would remain as a separate genus. For simplicity we are retaining the single genus *Ficalbia* as in Belkin (1962).

GENUS **Ficalbia** Theobald

SUBGENUS **Etorleptiomyia** Theobald

Ficalbia (Eto.) solomonis Belkin, 1962

Fi. solomonis Belkin, 1962: 292-94.

The immature stages have been found only in undisturbed jungle swamps with extremely dense vegetation. The females have not been collected biting man.

DISTRIBUTION. New Georgia Gp., Russell Is, Guadalcanal. Also Bougainville.

COLLECTION DETAILS. No new collections made.

TRIBE MANSONIINI

Belkin (1962: 301) regarded the Mansoniini as containing a single genus, *Mansonia*, with 4 subgenera, *Mansonia*, *Mansonioides*, *Coquillettidia* and *Rhynchotaenia*.

More recently *Mansonia* and *Coquillettidia* have been proposed as separate genera, each with 2 subgenera (Ronderos & Bachmann 1963 in Stone 1967: 203) but Mattingly (1971: 1 & 30) prefers to retain the single genus *Mansonia*. We have decided, for ease of comparison with Belkin (1962), to retain the single genus *Mansonia* for this review.

Genus **Mansonia** Blanchard

The 2 Old World subgenera, *Coquillettidia* and *Mansonioides*, are represented in the South Pacific by at least 5 species and 1 species, respectively.

Subgenus **Coquillettidia** Dyar

The subgenus *Coquillettidia* is represented in the South Pacific by 5 species which fall into 3 groups: the monotypic *tenuipalpis* group of New Zealand; the *iracunda* group with 1 species also confined to New Zealand; and the *crassipes* group of 3 species found in Samoa, Fiji, New Caledonia, New Hebrides and the Solomons.

CRASSIPES GROUP

Mansonia (Coq.) lutea Belkin, 1962

Ma. lutea Belkin, 1962: 309–11.

Although only a single larva of *Ma. lutea* has been collected in the Solomons the adults are fairly commonly found as they are apparently readily attracted to artificial lights.

Distribution. Vella Lavella, New Georgia, Gp., Russell Is, Guadalcanal, Malaita. Also Bougainville.

Collection details. *Vella Lavella:* 17.XI.1963*, nr Arewana, ? trapped, 1 ♀ (JG). *Russell Islands:* 18.VII.1964, Pavuvu I, Pepesala, 0–100 m, malaise trap, 1 ♀, 2 ♂♂ (RS). *Guadalcanal:* 22.V.1960, Paripao, ? trapped, 2 ♂♂ (CB); 13.I.1970, Honiara, in house, 1 ♀ (T/0026); 5.III.1970, same locality, indoor day-resting, 2 ♀♀ (T/0134-5); 24.V.1971, same locality, indoor day-resting, 1 ♀ (T/0479); 30.IV.1972, same locality, attracted to house light, 1 ♀, 1 ♂ (T/0838-9). *Malaita:* 3.X.1957*, Auki, ? pandanus, 2–20 m, 2 ♀♀ (JG).

Subgenus **Mansonioides** Theobald

The subgenus is confined to the Old World where it occurs from West Africa to the Solomons. In the South Pacific it is represented by a single species in the Solomons.

Mansonia (Mnd.) melanesiensis Belkin, 1962

Ma. melanesiensis Belkin, 1962: 314–16.

Ma. melanesiensis is a vicious man-biter which is rarely a serious pest as it does not seem to fly far from its breeding sites which are not very numerous or extensive. The immature stages have not been found in the Solomons.

Distribution. Guadalcanal. Also Bougainville.

Collection details. *Guadalcanal:* 26.IV.1973, Burns Creek swamp, inland of King George VI School, Honiara, day man-biting, 3 ♀♀ (T/1076-8).

Tribe AEDINI

The tribe Aedini comprises a relatively large number of genera, all of which, except for *Aedes*, contain few species. In the South Pacific only *Aedes*, *Armigeres* and *Opifex* are represented and the last of these is restricted to New Zealand.

Genus **Aedes** Meigen

The genus is extremely large with over 750 species and subspecies distributed worldwide. In the South Pacific nearly 80 species are known in 12 or possibly 13 subgenera. Ten subgenera are known from the Solomons and these comprise 36 species and 3 incompletely described forms. The subgenera are *Geoskusea*, *Finlaya*, *Ochlerotatus*, *Mucidus*, *Edwardsaedes*, *Verrallina*, *Aedimorphus*, *Lorrainea*, *Stegomyia* and an undetermined subgenus (for an *Aedes* species from Bougainville and Choiseul, Belkin 1962: 422).

Subgenus **Geoskusea** Edwards

Geoskusea is a small subgenus restricted to Indonesia, the Philippines, New Guinea and the Bismarcks, ? northern Australia, the Solomons and the New Hebrides.

Three species, *Ae. becki*, *Ae. perryi* and *Ae. longiforceps*, are known from the Solomons.

Aedes (**Geo.**) **becki** Belkin, 1962

Ae. becki Belkin, 1962: 334.

Previously known only from Roviana, New Georgia Group, where 3 ♀♀ and 3 ♂♂ had been collected in crabholes or reared from immature stages found in crabholes. A single ♂ specimen collected by C. W. O'Brien (deposited in the Bishop Museum) comes from Santa Isabel.

Distribution. New Georgia Gp. (Roviana), Santa Isabel.

Collection details. *Santa Isabel:* 13.VI.1960*, Nagala, no details known, 1 ♂ (CB).

Aedes (**Geo.**) **perryi** Belkin, 1962

Ae. perryi Belkin, 1962: 336.

The immature stages of this species are unknown. The adults have been collected resting in crabholes, in man-biting catches and by light traps.

Distribution. ? Russell Is (Banika), Florida Gp., Guadalcanal.

Collection details. *Florida Group:* 9.IX.1960*, Big Nggela, Haa, light trap, 1 ♀, 1 ♂ (CB); 12.IX.1960, Takopekope, light trap, 2 ♀♀ (CB); 15.IX.1960, Small Nggela, Hanuvaivine, light trap, 1 ♀, 1 ♂ (CB); 10.VIII.1972, Big Nggela, Boromole, day-resting in crabholes at edge of mangrove pools, 8 ♂♂ (T/0981-8). *Guadalcanal:* 7.V.1973, Gilutae, day-resting in crabholes by side of brackish lagoon, 4 ♀♀, 3 ♂♂ (T/1099-1105).

Aedes (**Geo.**) **longiforceps** Edwards, 1929

Ae. longiforceps: Belkin, 1962: 337–38.—Slooff & Marks, 1965: 16.—Slooff, 1972: 178.

It is the commonest *Geoskusea* in the Solomons. The females readily bite man and the immature stages and adults have been collected from crabholes. The female has been recorded biting a mud-skipper fish by Slooff & Marks (1965).

Distribution. Choiseul, Vella Lavella, Gizo I, Kolombangara, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Malaita, San Cristobal. Also Bougainville.

COLLECTION DETAILS. *Choiseul:* 19.III.1973*, Bubukuana, day-resting in crabholes, 2 ♂♂ (T/1038-9). *Vella Lavella:* 17.XI.1963*, Gingola, 60 m, ? trapped, 2 ♀♀ (PS); 17 & 18.XI.1963, Pusisama, malaise trap, 2 ♀♀ (PS). *Gizo Island:* 24.V.1972, New Manda, day-resting in crabholes, 1 ♀, 1 ♂ (T/0887-8). *Kolombangara:* 9.VII.1964*, Sandfly Harbour, 2 m, malaise trap, 2 ♀♀ (JS). *Santa Isabel:* 14.VI.1960*, San Jorge I, Kaula Plantation, light trap, 1 ♀ (CB); 5.VII.1960, Buala, light trap, 1 ♂ (CB); 2.IX.1964, Tatamba, 0–50 m, light trap, 1 ♂ (RS). *Florida Group:* 9.VIII.1972, Big Nggela, Boromole, day man-biting, in mangrove swamp, 1 ♀ (T/0964); 10.VIII.1972, same locality, day-resting in crabholes, 1 ♀, 1 ♂ (T/0979-80). *Guadalcanal:* 1.III.1971, Honiara, day man-biting indoors, 1 ♀ (T/0369); 10.III.1972, Koli, day-resting in crabholes, 3 ♀♀, 2 ♂♂ (T/0825-9); 26.IV.1973, Burns Creek swamp, inland of King George VI School, Honiara, day man-biting, 4 ♀♀ (T/1079-82); 7.V.1973, Gilutae, day-resting in crabhole, side of brackish lagoon, 1 ♂ (T/1106). *Malaita:* 18.II.1970*, Rohinari, W Are Are, details unknown, juv (MM, 700218). *San Cristobal:* 7.XI.1964*, Kira Kira, 0–200 m, light trap, 1 ♂ (RS); 13.XI.1964, Kira Kira, 0–50 m, malaise trap, 2 ♀♀, 1 ♂ (RS); 15.XI.1964, same locality, 1 ♂ (RS); 21.VII.1972, same locality, day-resting in crabholes, 3 ♀♀, 2 ♂♂ (T/0910-4); 24.VII.1972, same locality, 4 ♂♂ (T/0957-60); 25.VII.1972, Arohane, day-resting in crabholes, 1 ♀ (T/0924).

SUBGENUS **Finlaya** Theobald

This is a large subgenus which is a heterogeneous assemblage of over 200 species of *Aedes*. In the South Pacific 4 groups of *Finlaya* are represented—the *aureostriatus* group, the *mediovittatus* group, the *alboannulatus* group and the *kochi* group—all of which have member species found in the Solomons.

AUREOSTRIATUS GROUP

The group is represented in the Solomons by a single species, *Ae. rubiginosus*. The other members of the group are known from New Guinea and Australia.

Aedes (Fin.) rubiginosus Belkin, 1962

Ae. rubiginosus Belkin, 1962: 346–47.

The original collection records for this species are confused. Two female, 3 male and 1 damaged adult specimens only are known. It is probable that *Ae. rubiginosus* breeds in treeholes.

DISTRIBUTION. ? Guadalcanal.

COLLECTION DETAILS. No further specimens found.

MEDIOVITTATUS GROUP

The group is represented in the Solomons by both the species, *Ae. notoscriptus* and *Ae. albilabris*, known from the South Pacific.

Aedes (Fin.) notoscriptus (Skuse, 1889)

Ae. albilabris in part of Belkin, 1962: 350-52.

Ae. notoscriptus: Belkin, 1962: 348.—Maffi, 1973b: 46.—Taylor, 1973: 63.

This species was not reported by Belkin (1962) from the Solomons but collections by us on the islands of Rennell and Bellona showed that Belkin's identification of damaged specimens as *Ae. albilabris* was erroneous and that on these islands there is an abundant population of *Ae. notoscriptus* (Maffi 1973b). However, *Ae. notoscriptus* shows extreme variability of adult and juvenile characters and an overall study of the different geographical populations is required. The adult females readily bite man by day in forested areas. The juvenile stages have been found in treeholes, rockholes, coconut shells and large artificial containers.

DISTRIBUTION. Rennell and Bellona. Also Australia, New Guinea, Moluccas, New Caledonia and New Zealand.

COLLECTION DETAILS. *Bellona:* 13.V.1972, at airstrip, day man-biting, 2 ♀♀ (T/0869-70, collected by F. B. Eyres & H. Williams).

Aedes (Fin.) albilabris Edwards, 1925

Ae. albilabris: Belkin, 1962: 350-52.—Slooff, 1972: 178.

This is an extremely common and adaptable species which uses a wide variety of breeding places. These include treeholes, bamboo stumps, leaf axils (including pandanus and palms), coconut shells and husks and a wide variety of artificial containers. Despite the abundance of the species, adult females have rarely been collected while attacking man. The *Coelomomyces* fungal infection in a larva collected at Kira Kira, San Cristobal, on 11 March 1971 is the first record of such an infection in this mosquito. The record on the Russell Islands is in Belkin's personal notes but not in his published list.

DISTRIBUTION. Treasury Is, Choiseul, Waghena, Kolombangara, New Georgia Gp., Rendova, Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Malaita, San Cristobal, Ugi, Santa Ana, Santa Catalina. Also Bougainville.

COLLECTION DETAILS. *Choiseul:* 10.III.1969, Luti, 1/2 coconut shell, juv (MM, 690310/2); 19.III.1973, Bubukuana, tree cleft, muddy beach, 1 L, 2 p (T/W. 14) assoc. 1 ♀ & 1 ♂ (T/1043-4); 21.III.1973, Nukiki, hole on fallen dead tree, 1 ♀ (T/1058); same data except coconut containing freshwater, on beach, 2 ♂♂ (T/1059-60). *Waghena:* 13.III.1969*, Cookson, treehole, juv (MM, 690313/0). *New Georgia Group:* 22.IV.1971, Nusu Lavata I, Wana Wana Lagoon, treehole in mangrove, 1 L (T/W. 4), 3 ♀♀ (T/0448-50); 27.IV.1971, New Georgia I, Seghe, treehole in mangrove, 4 L (T/W. 8), 1 ♂ (T/0468). *Santa Isabel:* 2.IX.1964*, Tatamba, 0-50 m, malaise trap, 1 ♂ (RS); 6.IX.1964, same locality, 0-50 m, light trap, 1 ♀ (RS). *Florida Group:* 12.X.1964, Big Nggela, Haleta, 200 m, ? trapped, 1 ♀ (RS); 12.VIII.1969, Sandfly I, Boroni, rainwater pool on tree, seashore, juv (MM, 690812/5); 10.VIII.1972, Big Nggela, Boromole, treehole, freshwater swamp, 2 L (T/Ng. 4). *Guadalcanal:* 29.VI.1970, Honiara, in house, 1 ♀ (T/0148); 5.VII.1971, Maravovo, treehole, 2 L (T/G. 6), 1 ♀ (T/0613); 20.VIII.1971,

Rove, Honiara, treehole, 1 ♂ (T/0817); 10.III.1972, Koli, hole in coconut palm, 1 ♂ (T/0819); same data except pool on tree, rainwater and debris, 4 ♀♀, 3 ♂♂ (T/0830-6), 13.IX.1972, Motopulu, early evening man-biting, 3 ♀♀ (T/0995-7). *Malaita:* 18.II.1970, Rohinari, W Are Are, details unrecorded, juv (MM, 700218); 28.XI.1972, Maka, S Are Are, cleft tree root on hilltop, 80 m, 1L (T/Mala. 15); same date, locality, foreshore area, axils very large, saw-edged broadleaf pandanus, 2 L (T/Mala. 12). *San Cristobal:* 1.VIII.1960*, Kira Kira, light trap, 1 ♀ (CB); 7.XI.1964, same locality, 0–200 m, malaise trap, 1 ♂, light trap, 1 ♂ (RS); 13.XI.1964, same locality, 0–50 m, malaise trap, 1 ♂ (RS); 9.X.1970, Namugha, Star Harbour, groove on tree stump, nr sea, full of rainwater, 1 L (MM, 701009/3); 6.III.1971, Maitoo Plantation, treehole, 3 L (T/Mak. 1); 11.III.1971, Kira Kira, tin can, rainwater, 1 L (T/Mak. 5); same data except hole on fallen tree, rainwater, 5 L (T/Mak. 6, 1 with *Coelomomyces* sporangia), 1 ♀, 3 ♂♂ (T/0403-6); same except resting above water in treehole, 2 ♂♂ (T/0401-2); 15.III.1971, Arohane, treehole, mangrove tree, on seashore, 4 L, 1 P (T/Mak. 12), 2 ♀♀, 1 ♂ (T/0421-3); same date, Tawani, treehole in coconut palm, 1 ♂ (T/0349); same date, nr Pawa, treehole, 9 L (T/Mak. 13); same date, Kira Kira, banana stump, 3 L, 1 P (T/Mak. 14), 1 ♀, 3 ♂♂ (T/0435-8); 20.VII.1971, Manibwena, banana stump, 1 L (T/Mak. 36); same data except treehole, 2 L (T/Mak. 37); 22.VII.1971, Kira Kira, treehole, 2 p (T/Mak. 23) assoc. 1 ♀, 1 ♂ (T/0618-9); same except water in sago palm stump, deep shade, 1 p (T/Mak. 29) assoc. ♂ (T/0624); 14.IV.1972, Kira Kira, beach, cleft on tree, leaves in water, 1 p (T/Mak. 52) assoc. ♀ (T/0850); 21.VII.1972, Kira Kira, treehole, swamp area, 11, 2 p (T/Mak. 57) assoc. 2 ♂♂ (T/0906-7); 22.VII.1972, Baunasughu, cut green bamboo, 8 L, 2 p (T/Mak. 62) assoc. 1 ♀, 1 ♂ (T/0291-2). *Ugi:* 13.X.1970, E of Suasi, groove on roots of tree on beach, 4 L, 1 P (MM, 701013/6); 4.VII.1971, Pwaunania, treehole, dirty water, 1 L (T/Mak. 17); same date, Aliteapu, treehole, clean water, 3 L (T/Mak. 18). *Santa Ana:* 8.X.1970*, between Nafinuatogo and Natagera, treehole at edge of beach, 2 L (MM, 701008/2). *Santa Catalina:* 7.X.1970*, inland of Maniori, small groove on side of fallen tree, dead leaves, 4 L, 2 P (MM, 701007/2); same except further inland, larger groove on tree, 2 L, 6 P (MM, 701007/3); same date, swamp in center of island, fermented water in a sago palm stump, 1 L, 2 P (MM, 701007/5).

ALBOANNULATUS GROUP

This group is a very heterogeneous assemblage of species from all zoogeographic regions except the Ethiopian and Malagasy. Of the 11 subgroups, 2 are represented in the Solomons: the *biocellatus* subgroup by *Ae. roai*, and the *papuensis* subgroup by *Ae. argyronotum.*

Aedes (Fin.) roai Belkin, 1962

Ae. roai Belkin, 1962: 353–54.

The species is known only from 3 female and 3 male specimens collected in treeholes in Wright's Creek (now known as Vara Creek), Matanikau River valley, Guadalcanal, on September 22 and 30, 1944. Superficially the adults are very similar to *Ae. argyronotum.*

DISTRIBUTION. Guadalcanal.

COLLECTION DETAILS. No further specimens found.

Aedes (Fin.) argyronotum Belkin, 1962

Ae. argyronotum Belkin, 1962: 354–56.

A relatively uncommon species whose juvenile stages have been collected from treeholes, rockholes and rock pools. The majority of treehole collections have been near the sea while rock-pool collections have been principally from well inland. Thus, it seems possible that more than 1 species is involved, but as all but 1 of the adult specimens we have studied were reared from coastal treeholes no more than speculation is possible at present. The adult female collected by light-trapping at Kira Kira, San Cristobal, by C. W. O'Brien is the first collection of an adult in the field.

DISTRIBUTION. New Georgia Gp., Guadalcanal, San Cristobal.

COLLECTION DETAILS. *Guadalcanal:* 24.X.1968, Namunambosa, R Manugogo, rockholes, sunny, with dead leaves, juv (MM, 2 collections); 29.X.1968, Vungali, R Kolombavalu, rockholes, sunny, dead leaves, juv. (MM); 15.VIII.1970, Tambili, 4 L (MM, 700815); 6.IX.1970, Matanikau R valley, 5 P, 10 L (MM, 700906/4), 1 ♀ (T/0357); 17.XI.1972, Nuhu, Sutakama R, riverside pools, 4 L (T/G. 28); 18.XI.1972, Valembaibai, Sutakama R, riverside pools, 2 L, 3 P (T/G. 29); 21.XII.1972, Lees Lake, lakeside, 10 L (T/G. 30). *San Cristobal:* 14.VIII.1960*, Kira Kira, light trap, 1 ♀ (CB); 2.X. 1970, Magoha R, 5 km inland, rock pools along the bank, 4 L, 2 P (MM, 701002/1); 3.X.1970, Magoha R, Rikiapu to Vugiroga, rock pool in small stream, 1 L (MM, 701003/1); 15.X.1970, eastern end of Ngorangora airfield, saltwater pools on coastal rocks, sunlit, 14 L, 7 p (MM, 701015/3), 1 ♀, 3 ♂♂ (T/0388-91); 15.III.1971, Arohane, treehole, on shore, 1 L (T/Mak. 12); 14.IV.1972, Kira Kira, coconut shell, with fresh water and plant debris, on beach, 1 L, 2 p (T/Mak. 43) assoc. 1 ♂ (T/0851); same data except cleft on tree, plant debris, on beach, 3 p (T/Mak. 52) assoc. 3 ♀♀ (T/0847-9); 23.VII. 1972, Tawani, shore area, cleft on tree root, 2 L (T/Mak. 63); 19.VIII.1972, between Maniate and Oke Oke, stagnant water on stone, pool full of dead leaves, 1 L (T/Mak. 73); 21.VIII.1972, Magoha R, upstream from Manighari, stagnant riverside pool, dead leaves, 1 L (T/Mak. 74).

KOCHI GROUP

The *kochi* group has been reported from India to Samoa and Tonga and from the Philippines to New South Wales. The group is very imperfectly known and is very prone to speciation. The immature stages are confined almost entirely to small water collections in the leaf axils of certain plants. In the Solomons the known species fall into several complexes: the *bougainvillensis* complex which includes *Ae. bougainvillensis*, *Ae. hollingsheadi*, *Ae. maffii*, *Ae. neogeorgianus* and *Ae. schlosseri*; the *solomonis* complex which includes *Ae. fuscipalpis*, *Ae. fuscitarsis* and *Ae. solomonis*; the *knighti* complex which includes *Ae. knighti* and Belkin sp. 23; the *franclemonti* complex which includes *Ae. franclemonti* and *Ae. horotoi*.

BOUGAINVILLENSIS COMPLEX

Aedes (Fin.) bougainvillensis Marks, 1947

Ae. bougainvillensis: Belkin, 1962: 362-63.

All known adults of this relatively rare species have been reared from juvenile stages collected from leaf axils of species of Pandanaceae. The distribution is not clear as there is a discrepancy between Belkin's published list and his personal records. However, the adults of the complex are superficially similar and Belkin notes that the specimens reported by Marks (1947: 26) could be *Ae. neogeorgianus, Ae. hollingsheadi, Ae. schlosseri* or *Ae. bougainvillensis.*

DISTRIBUTION. Treasury Is, Choiseul, ? Vella Lavella, New Georgia Gp., ? Russell Is (Banika), Florida Gp., and Guadalcanal. Also Bougainville.

COLLECTION DETAILS. *Choiseul:* 20.III.1973*, Poro Poro, axils of narrow-leaf pandanus, 3 L, 1 p (T/W. 19) assoc. 1 ♀ (T/1053).

Aedes (Fin.) hollingsheadi Belkin, 1962

Ae. hollingsheadi Belkin, 1962: 372-73.

This is an apparently widely distributed although relatively uncommon species which breeds only in the leaf axils of pandanus species. The malaise trap collections of adult females, by R. Straatman, reported below are the first collections of adults in the field.

The specimens of *Ae. hollingsheadi* from Sikaiana reported by Belkin (1962, 1965) are now considered to be *Ae. maffii*, which is common on Rennell (Taylor & Tenorio 1974).

DISTRIBUTION. New Georgia Gp., Santa Isabel, Russell Is, Guadalcanal, Malaita and San Cristobal. Also Bougainville.

COLLECTION DETAILS. *Santa Isabel:* 1.IX.1964*, Tatamba, 0-50 m, ? trapped, 1 ♀ (RS). *Russell Islands:* 26.VII.1964*, Banika I, Yandina, 100 m, malaise trap, 1 ♀ (RS). *Malaita:* 28.XI.1972*, Maka, S Are Are, axils of very large, saw-edged broadleaf pandanus, 2 L (T/Mala. 12). *San Cristobal:* 21.VII.1972*, Kira Kira, axils of narrow-leaf pandanus, 1 to 2 m above ground, 7 L (T/Mak. 59), 2 p (T/Mak. 59a) assoc. 2 ♂♂ (T/0915-6), 1 p (T/Mak. 59b) assoc. ♀ (T/0917); 27.VII.1972, same locality, 6 L (T/Mak. 67), 1 p (T/Mak. 67a) assoc. ♀ (T/0962).

Aedes (Fin.) maffii Taylor & Tenorio, 1974

Ae. hollingsheadi in part of Belkin, 1962: 372-73; 1965.

Ae. (Fin.) sp. in *kochi* gp. of Taylor, 1973: 63-64.

This species is readily collected as juvenile stages from the leaf axils of broad-leaved pandanus species on Rennell. The specimens of the *kochi* group collected by D. Bonnet on Sikaiana in 1955 and identified by Belkin (1962, 1965) as *Ae. hollingsheadi* were re-examined by one of us (B.T.) and found to be *Ae. maffii.*

DISTRIBUTION. Rennell and Sikaiana.

COLLECTION DETAILS. No new reports.

Aedes (Fin.) neogeorgianus Belkin, 1962

Ae. neogeorgianus Belkin, 1962: 375-77.

This species is known only from the New Georgia Group where it has been collected from leaf axils of a very narrow-leaf "screw palm" (*Pandanus* species) and in taro leaf axils.

DISTRIBUTION. New Georgia Gp. (Arundel, Munda, Roviana).

COLLECTION DETAILS. No further specimens found.

Aedes (Fin.) schlosseri Belkin, 1962

Ae. schlosseri Belkin, 1962: 382-83.

According to Belkin this appears to be the dominant species of the *bougainvillensis* complex on Guadalcanal where it was commonly found in leaf axils of pandanus and once in taro axils. Belkin's personal records include specimens from Munda, New Georgia Group, although these do not appear in his published list.

DISTRIBUTION. ? New Georgia Gp., Guadalcanal, ? Florida Gp.

COLLECTION DETAILS. No further specimens found.

SOLOMONIS COMPLEX

Aedes (Fin.) fuscipalpis Belkin, 1962

Ae. fuscipalpis Belkin, 1962: 370-71.

This is a rare species known only from a single collection of immature stages from pandanus leaf axils at Tenaru, Guadalcanal.

DISTRIBUTION. Guadalcanal.

COLLECTION DETAILS. No further collections made.

Aedes (Fin.) fuscitarsis Belkin, 1962

Ae. fuscitarsis: Belkin, 1962: 371-72.

This species is known only from 7 collections from leaf axils of narrow- and broad-leaved pandanus at widely separated localities on Guadalcanal.

DISTRIBUTION. Guadalcanal.

COLLECTION DETAILS. No further collections made.

Aedes (Fin.) solomonis Stone & Bohart, 1944

Ae. solomonis: Belkin, 1962: 383-85.

The species as understood by Belkin comprises what may be a complex of sibling species as there is a good deal of variation between the specimens from the different islands. Although Belkin noted that all known adults had been reared it now seems this may be the commonest member of the *kochi* group in the Solomons, at least as far as adult collection is concerned. Like the other members of the group, *Ae. solomonis* breeds in the leaf axils of pandanus species.

Specimens from the Treasury Islands are noted by Belkin in his personal records although they are not included in his published distribution.

The male adult reared by one of us from Choiseul is of the Bougainville form.

DISTRIBUTION. Treasury Is, Choiseul, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Malaita and San Cristobal. Also Bougainville.

COLLECTION DETAILS. *Choiseul:* 20.III.1973*, Poro Poro, broadleaf pandanus axil, 1 m above ground, 2 L, 1 p (T/W. 18) assoc. ♂ (T/1051). *Santa Isabel:* 25.VIII.1964*, Buala, ? trapped, 1 ♀ (RS); 2.IX.1964, Tatamba, 0-50 m, light trap, 1 ♀ (RS); 6.IX. 1964, same locality, 1 ♀ (RS). *Russell Islands:* 20.VII.1964*, Pavuvu I, Pepesala, 0-100 m, malaise trap, 1 ♂ (RS); 25.II.1970, Banika I, Lever's Point, indoor day-resting, 2 ♀♀ (T/0123/4). *Florida Group:* 17.X.1964*, Big Nggela, Haleta, 250 m, malaise trap, 1 ♀ (RS). *Malaita:* 12.VII.1971*, Auki, in house, 1 ♀ (T/0612). *San Cristobal:* 13.XI.1964*, Kira Kira, 0-50 m, malaise trap, 1 ♀ (RS).

KNIGHTI COMPLEX

Aedes (Fin.) knighti Stone & Bohart, 1944

Ae. knighti: Belkin, 1962: 374-75.

Previously known only from New Georgia where Belkin noted it breeds in the lower axils of the broadest leaved local pandanus, *Ae. knighti* is clearly widely distributed throughout the Solomons. All our findings of immature stages were in broad- or medium-leaf pandanus species. The collection of a male adult at Boromole in the Florida Group is the first record of adults in the field.

DISTRIBUTION. Shortland Is, Choiseul, New Georgia Gp., Rendova, Florida Gp., Guadalcanal, Malaita, San Cristobal.

COLLECTION DETAILS. *Shortland Islands:* 22.III.1973*, Samanagha I, broadleaf pandanus axils, close to ground, 1 L (T/W. 24), 3 L, 1 p (T/W. 25) assoc. ♂ (T/1069). *Choiseul:* 20.III.1973*, Poro Poro, broadleaf pandanus axils, 0-1 m above ground, 2 L (T/W. 17), 2 L (T/W. 18); 21.III.1973, Nukiki, broadleaf pandanus axils, 1-2 m above ground, 8 L, 4 P, 3 p (T/W. 22) assoc. 2 ♂♂ (T/1064 and 1066), 1 ♀ (T/1065), also 2 ♀♀ (T/1067-8). *Florida Group:* 8.VIII.1972*, Big Nggela, Boromole, axil of broadleaf pandanus, nr beach, 3 L, 1 p (T/Ng. 1) assoc. ♀ (T/0963); 9.VIII.1972, same locality, day-flying, edge of coconut area, 1 ♂ (T/0974); same data except axil of broadleaf pandanus, 5 L (T/Ng. 3). *Guadalcanal:* 10.III.1972*, Koli, pandanus axil, 1 p (T/G. 11) assoc. ♂ (T/0818). *Malaita:* 24.XI.1972*, Tawanaora, E Are Are, axil saw-edged medium-leaf pandanus, 0.3 m above ground, 4 L (T/Mala. 1). *San Cristobal:* 14.IV.1972*, Kira Kira, beach, axils broadleaf pandanus, below 0.6. m, 2 L (T/Mak. 45), 1 p (T/Mak. 45a) assoc. ♂ (T/0900); same data except pandanus axils 1.3 to 2.0 m above ground, 3 L, 2 p (T/Mak. 53).

Aedes (Fin.) Belkin, sp. 23 Guadalcanal form

Ae. (Fin.) sp. 23 of Belkin, 1962: 386.

A single adult ♀ resembling *Ae. knighti* but with an extremely pale wing and other distinctive characters is known from Guadalcanal. Various larvae collected by M. V. Natuna at Malageti, South Guadalcanal, and on the Florida Group may also be of this form.

DISTRIBUTION. Guadalcanal, ? Florida Gp.

COLLECTION DETAILS. No further specimens found.

FRANCLEMONTI COMPLEX

Aedes (Fin.) franclemonti Belkin, 1962

Ae. franclemonti Belkin, 1962: 367-68.

This species is known with certainty only from the New Georgia Group and Rendova. It breeds in the leaf axils of a broad-leaved pandanus. A single female from Stirling Island in the Treasury Islands may be *Ae. franclemonti* but shows some differences and may belong to a distinct species.

DISTRIBUTION. ? Treasury Is, New Georgia Gp., Rendova.

COLLECTION DETAILS. No further specimens collected.

Aedes (Fin.) horotoi Taylor, 1972

Ae. (Fin.) sp. 24 Malaupaina form of Belkin, 1962: 386.

Belkin gave a brief and incomplete description of a single damaged female collected by R. J. A. W. Lever in May 1934 on Malaupaina, Three Sisters Group. The capture of 2 intact females at Manitawaniuhi, San Cristobal, by E. S. Horoto enabled one of us to fully describe and name the species (Taylor 1972). Nothing is known of the juvenile stages.

DISTRIBUTION. San Cristobal, Three Sisters Gp.

COLLECTION DETAILS. No further specimens collected.

UNDETERMINED COMPLEX

Aedes (Fin.) sp. in *kochi* gp., South Malaita form.

A single larva collected at Maka, South Malaita, from the leaf axil of a narrow-leaved vine of the pandanus family shows a distinctive reduction in the hair branching. The nearest member of the *kochi* group in the South Pacific appears to be *Ae. burnetti* which has been collected from *Freycinetia* leaf axils (a vine-like pandanus) in Fiji (Belkin 1962: 363–65).

DISTRIBUTION. Malaita.

COLLECTION DETAILS. *Malaita:* 28.XI.1972*, Maka, S Are Are, axil of narrow-leaf vine of pandanus family, shore area, 1 L (T/Mala. 11).

SUBGENUS **Ochlerotatus** Lynch Arribalzaga

The subgenus *Ochlerotatus* is 1 of the 2 largest subgenera of *Aedes*. It is, however, very poorly represented in the Old World tropics and in the South Pacific only 6 forms are known. Two of these forms are known from the Solomons.

Aedes (Och.) vigilax (Skuse, 1850)

Ae. vigilax: Belkin, 1962: 392–95.—Slooff, 1972: 178, 180.

This species has a wide distribution through SE Asia, Australia, New Guinea, the Solomons, New Hebrides and New Caledonia. However, in the Solomons it has been collected once on Guadalcanal (adults biting at Ilu Farm) by Laird in 1953 (Laird 1956: 84) and once on Choiseul by Slooff (1972). We did not come across the species, which is a primarily brackish water breeder in mangrove swamps and marshes and also known from

rockholes and freshwater ground pools. In the immediate vicinity of its breeding sites it is a vicious man-biter.

DISTRIBUTION. Choiseul, Guadalcanal. Also SE Asia, Australia, New Guinea, New Hebrides and New Caledonia.

COLLECTION DETAILS. No further collections.

Aedes (Och.) mcdonaldi Belkin, 1962

Ae. mcdonaldi Belkin, 1962: 396–98.

An apparently uncommon species whose immature stages have been found in shallow temporary pools in a densely shaded but open area near a swamp. All known adults have been reared.

DISTRIBUTION. New Georgia Gp. (Roviana), Guadalcanal. Also Bougainville.

COLLECTION DETAILS. No further collections

SUBGENUS **Mucidus** Theobald

The subgenus is confined to the Old World. Two groups are recognized: the *Mucidus* group, which is widespread in the Old World tropics and is represented in the South Pacific by *Ae. alternans* in New Caledonia and the Loyalty Islands; and the *Pardomyia* group, which occurs in the Indomalayan and Australasian regions only and is represented in the South Pacific by *Ae. painei* in the Solomons.

Aedes (Muc.) painei Knight, 1948

Ae. painei: Belkin, 1962: 405–07.

An uncommon species whose immature stages have been collected in temporary pools in forested areas and in coconut plantations. The larvae are carnivorous and include larvae of other mosquito species in their diet. The adults have not been collected attacking man.

DISTRIBUTION. Gizo I, Kolombangara, New Georgia Gp., Santa Isabel, Russell Is (Banika), Guadalcanal. Also Bougainville.

COLLECTION DETAILS. *Gizo Island:* 24.V.1972*, New Manda, freshwater taro swamp, l1 & p (T/W. 10) indiv. reared ♀ (T/0890). *Santa Isabel:* 14.IV.1969*, Samasodu, swampy collection in shade at foot of tree, juv (MM, slide mount now missing). *Guadalcanal:* 5.XI.1970, Honiara, caught indoors at night, 1 ♂ (T/0365).

SUBGENUS **Edwardsaedes** Belkin

The subgenus has a single member species, *Ae. imprimens.*

Aedes (Edw.) imprimens (Walker, 1861)

Ae. imprimens: Belkin, 1962: 409–11.

On Guadalcanal this species is one of the major pest mosquitoes in foothill areas, especially following the onset of the rainy season. The immature stages have been collected only a few times in temporary pools and in flowing water in flooded areas, in deep or partial shade.

DISTRIBUTION. New Georgia Gp., Guadalcanal, San Cristobal. Also Bougainville, New Britain, New Guinea and SE Asia.

COLLECTION DETAILS. *Guadalcanal:* 22.VI.1956, Gold Ridge, 600 m, 1 ♀ (JG); 15.IX. 1957, Tenaru R, 25 m, 1 ♀ (JG); 30.IV.1964, Honiara, 1 ♀ (RS); 3.V.1964, Honiara. 2 ♀♀ (RS); 5.V.1964, 25 km SSE of Honiara, 1 ♀ (RS); 7.V.1964, Roroni, light trap, 1 ♀ (RS); same date, Tenaru Creek, 10–50 m, 1 ♀ (RS); 8.V.1964, Nini Creek, 35 km SE of Honiara, malaise trap, 1 ♀ (RS); 10.V.1964, Roroni, 1 ♀ (RS); 12.V.1964, Roroni, 2 ♀♀, 1 ♂ (RS); 25. VI. 1964, Tenaru R, 30–60 m, 2 ♀♀ (JS); 12.I.1970, Honiara, night man-biting, 8 ♀♀ (T/0017-24). *San Cristobal:* 6.II.1971*, Manitawaniuhi, surface pool, 3 L (T/Mak. 2); 6.VI.1972, Arohane, outdoor day collection, 1 ♀ (T/0860); 16.VI.1972, same locality, 2 ♀♀ (T/0862-3); 25.VII.1972, same locality, 1 ♀ (T/0925).

SUBGENUS **Verrallina** Theobald

The subgenus *Verrallina* is relatively poorly known and is confined to the Oriental, Indomalayan and Australasian regions. In the South Pacific it is found only in the Solomons, the Santa Cruz Group and the New Hebrides, although only one of the species, *Ae. lineatus*, extends beyond the Solomons. Huang (1968) reviewed the *Verrallina* of the Papuan Subregion but her information is incomplete, especially in terms of the distribution of the South Pacific species.

Aedes (Ver.) cuccioi Belkin, 1962

Ae. cuccioi Belkin, 1962: 414–16.—Huang, 1968: 23–24.

Known from a few collections of immature stages mostly in rockholes and potholes in stream beds. No adult females have been collected in nature.

DISTRIBUTION. New Georgia, Guadalcanal. Also Bougainville and New Guinea.

COLLECTION DETAILS. *Guadalcanal:* 28.X.1968, Chimbu, Lake Vonu, ditch, P (MM).

Aedes (Ver.) carmenti Edwards, 1924

Ae. carmenti: Belkin, 1962: 416–18.—Huang, 1968: 18–22.—Slooff, 1972: 178.

Although this is one of the most serious pest mosquitoes in the Solomons its immature stages have been collected only a few times. It is apparently adapted to breeding in shallow, heavily shaded temporary jungle pools which are frequently flushed. The females attack man by day in shaded forested areas.

DISTRIBUTION. Treasury Is, Choiseul, Vella Lavella, Gizo I, Kolombangara, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, San Cristobal, Ugi. Also Bougainville, Bismarck Archipelago, New Guinea and Moluccas.

COLLECTION DETAILS. *Vella Lavella:* 15.XI.1963*, Kundurumbangara, 60 m, 1 ♀ (JG); 17.XI.1963, Pusisama, 1 ♀ (PS). *Gizo Island:* 26.V.1972*, New Manda, freshwater taro swamp, 1 L (T/W. 11). *Santa Isabel:* 6.IX.1964, Tatamba, 0–50 m, malaise trap, 1 ♀ (RS). *Russell Islands:* 25.II.1970, Banika I, Banika, day-resting in house, 2 ♀♀ (T/0120-1). *Florida Group:* 12.X.1964, Big Nggela, Haleta, 250 m, 1 ♀ (RS). *Guadalcanal:* 7.X.1957, Tenamba, 2–15 m, 4 ♀♀ (JG); 17.V.1964, Roroni, malaise trap, 2 ♀♀

(RS); 21.V.1964, Tambalia, malaise trap, 1 ♀ (RS); 15.I.1970, Honiara, Burns Creek swamp by golf course, day man-biting, 3 ♀♀ (T/0047-9); same date, Vura Creek, Kukum, day man-biting, 1 ♀ (T/0050); 28.III.1970, Honiara, in house, 1 ♀ (T/0141); 6.V.1971, Honiara, indoor day man-biting, 1 ♀ (T/0478); 10.III.1973, Koli, day man-biting in shade by stream, 1 ♀ (T/0822); same except day-resting in crabholes, 2 ♀♀ (T/0823-4); 7.V.1973, Gilutae, day-resting in crabhole, by side of brackish lagoon, 1 ♀ (T/1107). *San Cristobal:* 15.III.1971, Arohane, day man-biting, in shade under coconut palms, 2 ♀♀ (T/0419); 14.IV.1972, same locality, man-biting, early dawn, 1 ♀ (T/0852). 4.V.1972, same locality, indoor day-resting, 1 ♀ (T/0853); 6.VI.1972, same locality, outdoor day-resting, 1 ♀ (T/0859); 16.VI.1972, same locality, 1 ♀ (T/0925); 25.VII.1972, same locality, 1 ♀ (T/0926).

Aedes (Ver.) lineatus (Taylor, 1905)

Ae. lineatus: Belkin, 1962: 418-20.

This is a widely distributed and abundant species which readily attacks man in the daytime. It appears to be a semi-domestic species as its immature stages are most frequently found in temporary ground pools in cleared and partially shaded areas in association with man. It is frequently common around taro swamp gardens and its distribution to remote outlying islands may well have been effected as eggs on taro roots carried by migrating peoples.

DISTRIBUTION. Treasury Is, Waghena, Vella Lavella, Gizo I, Kolombangara, New Georgia Gp., Rendova, Russell Is, Florida Gp., Guadalcanal, Malaita, Ontong Java, Sikaiana, San Cristobal, Ugi. Also Bougainville, Santa Cruz Gp., Ceram, Sumba, New Guinea, Bismarck Archipelago, Australia (Queensland), New Hebrides, Banks Is.

COLLECTION DETAILS. *Waghena:* 25.II.1969*, Nukumaroro, depression filled with rainwater, leaves, juv (MM.). *Russell Islands:* 18.VII.1964, Pavuvu I, Pepesala, 0-100 m, 3 ♀♀ (RS). *Guadalcanal:* 5.X.1957, Kukum, 15 m, 1 ♀ (JG); 22.IV.1964, Honiara, 1 ♀ (RS); 25.IV.1964, Mt Austen, 300 m, 1 ♀ (RS); 8.V.1964, Roroni, 10 m, malaise trap, 1 ♀ (RS); 11.V.1964, Roroni, 10 m, light trap, 1 ♀ (RS); 21, 22, 24 & 27.V.1964, Tambalia, malaise trap, 7 ♀♀ (RS); 25.V.1964, Tenaru R, 30-60 m, 1 ♀ (RS); 15.I.1970, Honiara, Burns Creek swamp by golf course, day man-biting, 4 ♀♀ (T/0043-6); same date, Vura Creek, Kukum, day man-biting, 2 ♀♀ (T/0051-2); 10.III.1972, Koli, day man-biting, in shade by stream, 1 ♀ (T/0821); 26.IV.1973, Honiara, Burns Creek swamp, inland of King George VI School, day man-biting, 6 ♀♀ (T/1083-8). *Ontong Java:* 23.VII. 1971, Luaniua I, day man-biting, 37 ♀♀ (collected by F. D. Gibson, T/0741-57, T/0767-86); 25.VII.1971, Pelau I, day man-biting, 26 ♀♀ (T/0789-95, T/0797-815, coll. by F. D. Gibson); 10.VII.1972, Luaniua I, swamp, 6 L (T/OJ. 8). *Sikaiana:* VII.1971, day and night man-biting, 16 ♀♀ (coll. by F. D. Gibson, T/0709-19, T/0732-6). *San Cristobal:* 12.IV.1972, Arohane, wheel rut, no vegetation, 1 p (T/Mak. 48) assoc. 1 ♂ (T/0840). *Ugi:* 13.X.1970*, nr Kerepei Dispensary, small pool in grassy meadow, 1 L (MM, 701013/1); same date, between Rurunga and Suasi, attacking man, 2 ♀♀ (T/0377-8).

Aedes (Ver.) mccormicki Belkin, 1962

Ae. mccormicki Belkin, 1962: 420–21.—Huang, 1968: 37–38.

The species is probably more common than the few collections would indicate. The females do not normally attack man but it is apparently a general breeder in temporary ground pools in association with *Ae. carmenti* and *Ae. lineatus*.

Huang's key to larvae (1968: 14) is inaccurate as is her description (1968: 37) because on the siphon, hair 1-S is inserted within, and ventrad of the pecten teeth (as in Belkin 1962: 421). Pupal hair 9-VIII is 5-branched and not 3-branched as stated by Huang (1968: 37).

DISTRIBUTION. New Georgia Gp., Rendova, Guadalcanal. Also Bougainville.

COLLECTION DETAILS. *Guadalcanal:* 27.VI.1972, Honiara, Burns Creek swamp inland of King George VI School, 2 L, 1 P (T/G. 15).

Aedes Subgenus undetermined

Aedes sp. Bougainville form of Belkin, 1962: 422.—Slooff, 1972: 178, 180.

Known only from a collection of 4 larvae on Bougainville and a collection of larvae by Slooff on Choiseul (Sipozae Island).

DISTRIBUTION. Choiseul. Also Bougainville.

COLLECTION DETAILS. None found.

SUBGENUS **Aedimorphus** Theobald

The subgenus *Aedimorphus* is predominantly Ethiopian in distribution and, although well represented in the Oriental region, is poorly developed in the Indomalayan and Australasian regions. There are 2 major complexes: the *vexans* complex, which is represented in the South Pacific by *Ae. vexans* in the New Hebrides and New Caledonia and eastwards to Samoa and Rarotonga; and the *alboscutellatus* complex, which is represented in the South Pacific by *Ae. alboscutellatus* in the Solomons.

An up-to-date review of the subgenus in SE Asia with a comparative study of the Pacific Islands species was made by Reinert (1973).

Aedes (Adm.) alboscutellatus (Theobald, 1905)

Ae. alboscutellatus: Belkin, 1962: 425–27.—Slooff, 1972: 177.—Reinert, 1973: 17–23.

In the Solomons this is a relatively rare species. Adult females have been collected biting in the daytime in forested areas, but they are never abundant. The immature stages have been found in flooded swamp areas, woodland pools and in rockholes and potholes in a streambed.

DISTRIBUTION. Choiseul, Vella Lavella, New Georgia Gp., Guadalcanal. Also Bougainville, SE Asia, Indomalaya, Japan, New Guinea, Admiralties, Bismarck Archipelago, N Australia.

COLLECTION DETAILS. *Choiseul:* 19.II.1969, Papara, creek, grass, juv (MM). *Vella Lavella:* 17.XI.1963*, nr Arewana, 1 ♀ (JG). *New Georgia Group:* 14–15.VII.1959, New

Georgia I, Munda, 15-30 m, 2 ♀♀ (JG). *Guadalcanal:* 17.V.1964, Roroni, 10 m, malaise trap, 1 ♀ (RS).

Subgenus **Lorrainea** Belkin

The subgenus was erected by Belkin (1962: 430) for 6 species known principally from collections of immature stages in water collections in plants and also in artificial containers. Species of *Lorrainea* have been reported from New Guinea, Philippines, Indonesia, Malaya, Micronesia and the Solomons.

Aedes (Lor.) dasyorrhus King & Hoogstraal, 1946

Ae. dasyorrhus: Belkin, 1962: 431-32.—Maffi & Taylor, 1974.

This species, which is found only in areas close to the sea, is widely distributed and probably relatively common. The breeding sites are principally in holes in horizontal tree trunks projecting into or over ocean waters. The water in the holes is usually brackish because of saltwater spray. Other collections have been made in a rock pool and small containers such as a coconut shell and a tin can. The adult females will attack man but only in the vicinity of the breeding sites and all catches have been made in mangrove swamps.

Distribution. Choiseul, Waghena, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Malaita, San Cristobal. Also New Guinea, Schouten Is and Santa Cruz Gp.

Collection details. *Choiseul:* 19.III.1973*, Bubukuana, day-resting in tree cleft on beach, 2 ♀♀ (T/1040-1); same tree cleft, 13 L, 11, 2 p (T/W. 14) assoc. 1 ♀ (T/1042). *Waghena:* 13.III.1969*, Cookson, treehole, juv (MM, 690313/0). *New Georgia Group:* 27.IV.1971, New Georgia I, Seghe, treehole in mangroves, 1 ♂ (T/W. 8); same data except day man-biting, early morning, 1 ♀ (T/0470). *Santa Isabel:* 6.VII.1960*, Buala, light trap, 1 ♂ (CB); 12.IV.1969, Ghalata, coconut shell, juv (MM, 690412/1). *Russell Islands:* 26.II.1970*, Pavuvu I, Numungava, day-resting in house, mangrove area, 1 ♀ (T/0131). *Florida Group:* 10.VI.1969, Small Nggela, Toa, rock pool on seashore, juv (MM, 690610/5); 12.VIII.1969, Sandfly I, Boroni, pools on protruding branches of trees (*Barringtonia guppyana*) on beach, juv (MM, 690812/4 & 5); 13.VIII.1969, Mangolonga I, Takola, protruding tree branch as above, juv (MM, 690813/1); 9.VIII.1972, Big Nggela, Boromole, day man-biting in mangrove swamp, very localized, 6 ♀♀ (T/0965-70). *Malaita:* 21.I.1970*, Maramasike, Wallande, day man-biting in mangrove swamp, 1 ♀ (T/0053). *San Cristobal:* 9.X.1970*, Namugha, Star Harbour, groove on tree (*Thespesia populanea* Soland), rainwater and dead leaves, 4 L, 3 P (MM, 701009/5), 1 ♂ (T/0384).

Subgenus **Stegomyia** Theobald

A compact, clearly marked subgenus which is somewhat poorly known. The natural distribution of *Stegomyia* is confined to the Old World although *Ae. aegypti* has spread through human agency throughout the tropics. In the South Pacific Belkin (1962: 436-37) recognized 4 groups: the introduced *aegypti* group represented only by *Ae. aegypti*,

which is widespread but principally in the vicinity of seaports; the *albolineatus* group represented by the indigenous nominate species in the Solomons; the *edwardsi* group represented by 2 or 3 endemic species in the Santa Cruz Group; and the *scutellaris* group represented by nearly 20 species and undescribed forms occurring throughout the South Pacific except New Caledonia, the Loyalty Is, New Zealand and a few isolated eastern islands, of which 5 species occur in the Solomons.

AEGYPTI GROUP

Aedes (Stg.) aegypti (Linnaeus, 1762)

Ae. aegypti: Belkin, 1962: 442–43.

This cosmotropical and often abundant species is not known to breed in anything other than artificial containers in the South Pacific where it is largely confined to seaports. Apart from World War II collections in the Treasury Islands and on Guadalcanal (November and December 1943 in tires and barrels) the records noted by Belkin were in 1924 and 1925 in the Florida Group (Tulagi and Port Purvis) and in 1929 at Roviana. Paine, who visited plantations on Kolombangara, Santa Isabel, the Russell Islands, Guadalcanal, Tulagi, Malaita and the Three Sisters Group in 1928, noted that the species (as *Ae. argenteus*, see Belkin 1962) was universally met with in the plantation homesteads but he gave no detailed findings (Paine & Edwards 1929). The only recent collections have been by one of us in Honiara and even here it is uncommon and poses no problems as a pest.

DISTRIBUTION. Treasury Is, New Georgia Gp. (Roviana), Russell Is, Florida Gp., and Guadalcanal. Also cosmotropical.

COLLECTION DETAILS. *Guadalcanal:* 5.X.1972, Honiara, Chinatown, day-resting over water in 44-gallon (167 liters) drum, 1 ♂ (T/0998); in water, same drum, 2 L (T/G. 25); IV.1973, same locality, bamboo cup trap on Medical Department H.Q. fence, 1 l & p (T/G. 32), associated ♂ (T/1037), also 1 l & P (T/G. 32).

ALBOLINEATUS GROUP

Aedes (Stg.) albolineatus (Theobald, 1904)

Ae. albolineatus: Belkin, 1962: 444–45.—Slooff, 1972: 178.—Maffi, 1973b: 46.—Taylor, 1973: 64.

This is an extremely common and widely distributed species which breeds in treeholes, coconut shells and husks, bamboo stumps and, less frequently, fallen leaves and artificial containers. Occasional findings have been made in leaf axils and in rockholes. The females do not attack man, at least not in the Solomons.

DISTRIBUTION. Treasury Is, Choiseul, Waghena, Ranongga, Kolombangara, New Georgia Gp., Rendova, Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Rennell, Bellona, Malaita, San Cristobal, Ugi, Santa Ana, Santa Catalina. Also Bougainville, New Guinea, Admiralties, Bismarck Archipelago, Indomalayan and Oriental regions.

COLLECTION DETAILS. *Choiseul:* 10.III.1969, Luti, 1/2 coconut shell, juv (MM, 690310/2); 19.III.1973, Bubukuana, treehole on shore, 11 L (T/W. 15); 21.III.1973, Nukiki, coconut, fresh water, on beach, 1 L (T/W. 21), 1 ♀, 1 ♂ (T/1061-2); same data except resting in treehole, 1 ♀ (T/1054). *Waghena:* 25.II.1969*, Nukumaroro, depression filled with rainwater, leaves, juv (MM.). *New Georgia Group:* 22.IV.1971, Nusu Lavata I, Wana Wana Lagoon, treehole in mangrove, 8 L (T/W. 4); same data except coconut, fresh water, 4 L (T/W. 5). *Rendova*: 18.VII.1959, NE end of island, 1 ♀ (JG). *Santa Isabel:* 29.VI.1960, Molao, 1 ♀ (CB); 1, 2, 4 & 7.IX.1964, Tatamba, 0-50 m, malaise trap, 7 ♀♀ (RS); 2.IX.1964, same locality, light trap, 1 ♀ (RS); 9.IV.1969, Sepi, coconut 1/2 shell, juv (MM, 690409/1). *Russell Islands:* 26.II.1970, Alokun, water drum, juv (MM, 700226/1). *Florida Group:* 7.X.1964, Big Nggelà, Haleta, 0-100 m, 1 ♀ (RS); 17.X.1964, same locality, 250 m, 2 ♀♀ (RS); 8.VI.1969, Big Nggela, Mereka, 1/2 coconut shell, juv (MM 690608/4); 13.VIII.1969, Mangalonga I, Takola, coconut husk, juv (MM, 690813/3); 15.VIII.1969, Sandfly I, Leitongo, coconut husk, foul water, juv (MM, 690815/4); 10.VIII.1972, Big Nggela, Boromole, treehole, freshwater swamp area, 1 L, 2 P (T/Ng. 4); same area, small deep treehole, 1 L, 11, 1p (T/Ng. 5); 16.XII. 1972, Small Nggela, Salesapa, treehole, 2 ♂♂ (T/1024-5). *Guadalcanal:* 10.XI.1969, Honiara, in house, 1 ♀ (T/0003); 11.V.1971, Tambea, coconut shell, fresh water, 3 L (T/G. 2); VII.1971, Maravovo, treehole, 4 L (T/G. 6); 20.VIII.1971, Rove, Honiara, treehole in banyan, 2 L, 1 p (T/G. 7) assoc. ♀ (T/0816). *Malaita:* 20. VI. 1964, Dala, malaise trap, 1 ♀ (RS); 24.XI.1972, Tawanaora, E Are Are, pool on fallen tree, algae and leaves, 1 L (T/Mala. 6); 28.XI.1972, Maka, S Are Are, axils, very large saw-edged broadleaf pandanus, foreshore, 1 p (T/Mala. 12); same data except hole in coconut palm, on shore, 4 L (T/Mala. 13); same data except hole in tree buttress, hilltop, 80 m altitude, 1 L (T/Mala. 16). *San Cristobal:* 10*, 13, 15 & 20.XI.1964, Kira Kira, 0–50 m, malaise trap, 12 ♀♀ (RS); 9.X.1970, Namugha, Star Harbour, coconut shell, clear water, 5 L (MM, 701009/2); same data except groove on a tree stump, rainwater, 7 L (MM, 701009/3); 15.III.1971, nr Pawa, hole in coconut palm, 1 L (T/Mak. 10); same data except treehole, 2 ♀♀ (T/0424-5); 22.VII.1971, Kira Kira, treehole, 1 p (T/Mak. 23); same except swamp area, flying, 1 ♀ (T/0617); same except coconut, fresh water, 1 ♂ (T/0616); 23.VII.1971, Kira Kira farm, coconut, fresh water and debris, 2 L (T/Mak. 32); 12.IV. 1972, Maniparegho, treehole, tree on bank of R Ravo, 11 & p (T/Mak. 49) indiv. reared ♀ (T/0843); 13.IV.1972, Kira Kira, cut bamboo, 1 L (T/Mak. 51, Belkin Type A), 1 ♂ (T/0844). *Ugi:* 4.VII.1971, Pwaunania, treehole, dirty water, 4 L (T/Mak. 17). *Santa Catalina:* 7.X.1970*, between Ragapu and Maniori, treehole, 1 L (MM, 701007/1); same date, inland of Maniori, small groove on side of fallen tree, dead leaves, 1 L, 1P (MM, 701007/2); same date, further inland, larger groove on tree, 7 L (MM, 701007/3); same date, W of Ragapu, coconut husk, foul contents, 7 L, 5 P (MM, 701007/4); same date, swamp in center of the island, fermented water in sago palm stump, 2 P (MM, 700107/5), 1 ♀ (T/0376).

Aedes (Stg.) gurneyi Stone & Bohart, 1944

Ae. gurneyi: Belkin, 1962: 456–57.—Maffi, 1973b: 46.—Taylor, 1973: 64.

A not uncommon species whose immature stages are known predominantly from treeholes and tree stumps. Other collections have been made in leaf axils, coconut shells, artificial containers and, more rarely, in rockholes. The adult females do not usually attack man although one of us trapped a specimen man-biting on Rennell (Taylor 1973).

DISTRIBUTION. Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Rennell, Bellona, Malaita, San Cristobal. Also Bougainville.

COLLECTION DETAILS. *Santa Isabel:* 1.IX.1964*, Tatamba, 0–50 m, malaise trap, 1 ♀ (RS); 4.IX.1964, Tanatahi R, 0–50 m, malaise trap, 1 ♀ (RS); 4 & 5.IX.1964, Tatamba, 0–50 m, malaise trap, 4 ♀♀ (RS). *Russell Islands:* 25.II.1970, Banika I, Banika, day-resting in house, 1 ♀ (T/0119). *Florida Group:* 17.X.1964*, Big Nggela, Haleta, 250 m, malaise trap, 1 ♀ (RS). *Guadalcanal:* 17.V.1964, Roroni, 10 m, malaise trap, 1 ♀ (RS); 8.III.1970, Honiara, in house, 1 ♀ (T/0136); 23.IX.1970, same locality, 1 ♀ (T/0366); 18.XI.1972, Jeriko, Berande R, treehole, fallen tree, 6 L (T/G. 24). *Malaita:* 24.XI.1972*, Tawanaora, E Are Are, banyan buttress, treehole, 800 m from village, 1 L (T/Mala. 1). *San Cristobal:* 9.X.1970*, Namugha, Star Harbour, Tridacna shell full of rainwater, on the beach, 2 L (MM, 701009/4); 6.III.1971, Maitoo Plantation, treehole, 5 L (T/Mak. 1); 15.III.1971, nr Pawa, tree stump in garden, 2 L (T/Mak. 11), 3 ♀♀ (T/0426-8).

Aedes (Stg.) hebrideus Edwards, 1926

Ae. hebrideus: Belkin, 1962: 457–60.—Maffi, 1973b: 46.—Taylor, 1973: 64.

In the Solomons this species is restricted to the outlying islands where it can be an extremely serious pest, as the females readily attack by day in semi-shaded areas. It commonly breeds in treeholes, in coconut husks and shells, in all types of artificial containers and, less commonly, in rock pools. The larval collections on Sikaiana, in July 1971 by F. D. Gibson, complete the distribution arc from the Santa Cruz Group through Sikaiana, Ontong Java and Wuvulu to Nuguria. This distribution is almost certainly the result of transportation by migrating Polynesian peoples.

DISTRIBUTION. Rennell, Bellona, Ontong Java, Sikaiana. Also New Hebrides, Banks Is, Torres Gp., Santa Cruz Gp., Wuvulu and Nuguria.

COLLECTION DETAILS. *Bellona:* 13.V.1972, airfield, day man-biting, 16 ♀♀ (T/0871-86, coll. Eyres & Williams). *Ontong Java:* 23.VII.1971, Luaniua I, day man-biting, 13 ♀♀ (T/0737-40, T/0758-66, coll. F. D. Gibson); same data except canoe, shaded on beach, 12 L, 1 P (T/OJ. 1, coll. F. D. Gibson); 24.VII.1971, same locality, coconut shell shaded, near swamp, 1 L (T/OJ. 3, coll. F. D. Gibson); 25.VII.1971, Pelau I, day man-biting, 2 ♀♀ (T/0787-8, coll. F. D. Gibson); same data except coconut shells, in shade in dry taro swamp, 6 L, 3 p (T/OJ. 4), 1 L 1 p (T/OJ. 5); 11.VII.1972, Luaniua I, coconut shell, 8 L (T/OJ. 6, coll. B. Tugunua); same data except ? swamp, 9 L (T/OJ. 7, coll. B. Tugunua). *Sikaiana:* VII.1971*, coconut in shade, 1 L (T/Sik. 1, coll.

F. D. Gibson); trunk of banana palm on ground in shade, 9 L (T/Sik. 2, coll. F. D. Gibson); coconut shell, shaded, 14 L (T/Sik. 3, coll. F. D. Gibson).

Aedes (Stg.) hoguei Belkin, 1962

Ae. hoguei: Belkin, 1962: 460-61.—Taylor & Maffi, 1971.—Maffi, 1973b: 46.—Taylor, 1973: 65.

This is a rare species known only from a few collections on Rennell and Bellona where it is probably indigenous. The adult females have been collected attacking man in a forested area while the juvenile stages are known from coconut shells and small rock pools.

DISTRIBUTION. Rennell and Bellona.

COLLECTION DETAILS. No further collections.

Aedes (Stg.) quasiscutellaris Farner & Bohart, 1944

Ae. quasiscutellaris: Belkin, 1962: 471-72.

Ae. varuae in part of Slooff, 1972: 178, 180.

This is a very common and widely distributed species which is the dominant member of the *scutellaris* complex on the main islands of the Solomons. The immature stages are commonly found in treeholes, coconut shells and husks and all types of artificial containers. A few collections have been made in pandanus leaf axils and in ground pools. The females rarely, if ever, attack man.

DISTRIBUTION. Treasury Is, Choiseul, Waghena, Vella Lavella, Gizo I, New Georgia Gp., Rendova, Santa Isabel, Russell Is, Florida Gp., Savo, Guadalcanal, Malaita, San Cristobal, Ugi. Also Bougainville.

COLLECTION DETAILS. *Choiseul:* 21.II.1969*, Penetari, canoe, juv (MM); 23.II.1969, Kanata, coconut, 1/2 shell, juv (MM); 10.III.1969, Luti, treehole, juv (MM, 690310/1); 19.III.1973, Bubukuana, treehole on shore, 2 L (T/W. 15); 21.III.1973, Nukiki, holes on fallen tree on beach, 2 p (T/W. 20) assoc. ♀ (T/1057) and ♂ (T/1055), 11 & p (T/W. 20) indiv. reared ♀ (T/1056); same data except coconut, fresh water, 4 L (T/W. 21), 1 ♀ (T/1063). *Waghena:* 25.II.1969*, Nukumaroro, depressions filled with rainwater, leaves, etc., juv (MM, 2 collections); 13.III.1969, Cookson, treehole, juv (MM. 690313/0). *Vella Lavella:* 17.XI.1963*, Gingola, 60 m, 1 ♀ (PS); 2.VII.1969, Leona, coconut shell, juv (MM, 690702/2); 3.VII.1969, Karakesa Vill., coconut shell, juv (MM, 690703); 12.VII.1969, Vonunu school, canoe, juv (MM, 690712/2). *Gizo Island:* 20.IV.1971, Gizo Town, coconut spathe, foul water, 1 ♂ (T/0446); same date, Titiana, tin can, fresh water, 3 L (T/W. 1). *New Georgia Group:* 22.IV.1971, Nusu Lavata I, Wana Wana Lagoon, coconut, fresh water, 4 L (T/W. 5), 4 ♀♀, 5 ♂♂ (T/0451-9); same data except canoe under construction, foul water, 7 L (T/W. 6); 23. IV. 1971, Sasavele I, Roviana Lagoon, rainwater on iron tank, 1 ♂ (T/0463); 27.IV.1971, New Georgia I, Seghe, treehole in mangroves, 2 ♀♀ (T/0466-7); same data except coconut, fresh water, in mangrove area, 2 ♀♀ (T/0471-2). *Santa Isabel:* 21* & 23.VIII.1964, Buala, coconut shells on beach, 1 ♀, 1 ♂ (RS); 12.IV.1969, Ghalata, coconut shell, juv (MM, 690412/1);

13.IV.1969, Susubona, halves of coconut shells, juv. (MM, 690413/1 & 3); 14.IV.1969, Hurupelo, coconut shell, juv (MM, 690414/2); same date, Dadala, 10-gallon (38 liters) drum, rainwater, juv (MM, 690414/3). *Russell Islands:* 17.VII.1964, Pavuvu I, Pepesala, 0–100 m, emerged, 1 ♀ (RS); 20.VII.1964, same locality, 0–100 m, malaise trap, 1 ♀ (RS); II.1970, Pavuvu I, Nukufero, juv (ento. technicians); 26.II.1970, Alokun I, water drum, juv (MM, 700226/1); same date, Louna I, indoor day-resting, 1 ♂ (T/0130). *Florida Group:* 17.X.1964, Big Nggela, Haleta, 250 m, malaise trap, 1 ♂ (RS); 5.VI. 1969, Small Nggela, Bungana School, small rainpool at foot of tree, juv (MM, 690605); 8.VI.1969, Big Nggela, Mereka, canoe, juv (MM, 690608/3); Haroro, canoe, juv (MM, 690608/5); 12.VIII.1969, Sandfly I, Boroni, rainwater pool on tree, seashore, juv (MM, 690812/5); 13.VIII.1969, Mangolonga I, Takola, coconut husk, juv (MM, 690813/3); 14.VIII.1969, Sandfly I, Olevugha, canoe, juv. (MM, 690814/6); 15.VIII.1969, Sandfly I, Leitongo, coconut husk, foul liquid, juv (MM, 690815/4); 7.I.1970, Big Nggela, Vatupura, coconut husk, juv (MM, 700107/1); Big Nggela, Boromole, coconut husk, juv (MM, 700107/3), 2 ♂♂, 1 ♀ (T/0009-11). *Savo:* 30.XI.1968*, upstream R Santiana, rainwater in treehole, in forest, juv (MM). *Guadalcanal:* 14.V.1964, Tenaru Creek, 10–50 m, 1 ♀ (RS); 13.I.1970, Honiara, ? in house, 1 ♀ (T/0025); 11.V.1971, Tambea, coconut, fresh water, 1 ♀, 2 ♂♂ (T/0475-7); VII.1971, Maravovo, treehole, 1 p (T/G. 6). *Malaita:* 28.I.1969, Manaoba I, Hatodea, canoe, juv (MM, 690128/1); 23.III.1969, Maramasike I, Wallande, hole at foot of tree, juv (MM, 690323/1); 24.XI.1972, Tawanaora, E Are Are, small treehole, 1 km from village, 80 m altitude, 1 L (T/Mala. 5, atypical form); same data except pool on fallen tree, algae and leaves, 2 L (T/Mala. 6); same except coconut shell, fresh water, 1 L, 2 P (T/Mala. 7); same except treehole, 1 ♀, 2 ♂♂ (T/1008-10); 25.XI.1972, nr Pisua, E Are Are, coconut shell, fresh water and debris, 290 m altitude, 3 p (T/Mala. 10) assoc. 1 ♀, 2 ♂♂ (T/1014-6). *San Cristobal:* 9.X.1970*, Namugha, Star Harbour, groove on a tree stump, full with rainwater, 2 L (MM, 701009/3); 15.X.1970, Kira Kira, W of Pui Pui R, waterlogged garden, 5 L, 3 P, 5 p (MM, 701015/1), 2 ♀♀ (T/0386-7); 11.III.1971, Kira Kira, tin can, rainwater, 2 L (T/Mak. 5); same data except hole on fallen tree, 1 ♀ (T/0407); same data, tin plate, rainwater, 3 L (T/Mak. 7); 15.III.1971, Tawani, coconut shell, fresh water, 6 L (T/Mak. 8), 1 ♀, 3 ♂♂ (T/0435-8); same data except coconut husk, fresh water, 4 L (T/Mak. 9); same date, Kira Kira, banana stump, 1 ♀ (T/0429); 22.VII.1971, Kira Kira, Pui Pui R, coconut, fresh water and debris, 3 L, 4 p (T/Mak. 26) assoc. 4 ♀♀, 1 ♂ (T/0632-6); same data except beach, canoe under construction, 3 L (T/Mak. 27). *Ugi:* 13.X.1970*, S of Kerepei, discarded rusty tin among rocks, rainwater, 6 L (MM, 701013/3); same date, S of mouth of R Rurunga, half 40-gallon (151 liters) drum, full of rusty water, 10 L, 2 P (MM, 70103/4); same date, at southern tip of small lake, E of Suasi, groove on roots of tree, 2 L, 2 P (MM, 701013/8); same data except further east, in coconut grove, coconut spathe, in sun, 2 L (MM, 701013/9); same except nr Sungasau, 1/2 coconut husk, clear rainwater, 6 L, 2 P (MM, 701013/11); same except nr Tawarogo, heaped coconut husks, 4 L (MM, 701013/12); 14.X.1970, Kerepei Dispensary, indoor

day-resting, 1 ♀ (T/0385); same date, Hakanipua, coconut husk, foul water, 10 L (MM, 701014/2).

Aedes (Stg.) varuae Belkin, 1962

Ae. varuae: Belkin, 1962: 478-80.—in part of Slooff, 1972: 178, 180.

This species is apparently endemic to the Santa Cruz Group and has probably been transported to Sikaiana and Ontong Java by migrating Polynesian peoples. The Ontong Java finding, by F. D. Gibson, is the first record on this atoll.

The report by Slooff (1972) of *Ae. varuae* from Choiseul (Liu Liu) and New Georgia (Labete, Munda) is, in our opinion, somewhat dubious. We have not seen the juvenile stage material he collected but a series of adults (left in Honiara by Slooff and now placed in the Bishop Museum by us) are all *Ae. quasiscutellaris* specimens. Other *Ae. quasicutellaris* material collected by us on Choiseul shows atypical larval chaetotaxy, and Belkin (1962: 471-72) commented on the variability shown by *Ae. quasiscutellaris*. The juvenile stages are usually found in coconut shells with relatively fresh water. Laird (1956) made a collection from a pandanus leaf axil on Sikaiana.

DISTRIBUTION. Ontong Java, Sikaiana. Also Santa Cruz Gp. (see Taylor & Maffi 1974).

COLLECTION DETAILS. *Sikaiana:* VII.1971, coconut in shade, 3 L (T/Sik. 1, coll. F.D. Gibson); coconut shell, shaded, 5 L (T/Sik. 3, coll. F. D. Gibson). *Ontong Java:* 23.VII. 1971*, Luaniua, coconut shell in bright sun, nr beach, 1 L (T/OJ. 2, coll. F. D. Gibson); 11.VII.1972, coconut shell, 1 L (T/OJ. 6, coll. B. Tugunua).

GENUS **Armigeres** Theobald

The genus *Armigeres* is primarily Oriental in distribution but is widespread and well represented in the Indomalayan and Australasian regions. In the South Pacific a single species, *Ar. breinli*, which is a member of the *malayi* complex of the subgenus *Armigeres*, is known from the Solomons and the Santa Cruz Group.

SUBGENUS **Armigeres** Theobald, 1901

Armigeres (Arm.) breinli (Taylor, 1914)

Ar. breinli: Belkin, 1962: 482-84.—Slooff, 1972: 178.

A widely distributed species which can be a serious pest, as the females viciously attack man during the daytime and, to a lesser extent, at night. It is, however, restricted to coconut groves, as it rarely breeds in anything other than coconut shells and husks which contain a great deal of decaying coconut meat.

DISTRIBUTION. Treasury Is, Shortlands (Ballalae I), Choiseul, Vella Lavella, Gizo I, Kolombangara, New Georgia Gp., Rendova, Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Malaita, Ulawa. Also Santa Cruz Gp., Bougainville, Bismarck Archipelago, New Guinea.

COLLECTION DETAILS. *Shortland Islands:* III.1973*, Ballalae I, females observed biting man, none collected. *Vella Lavella:* 14.XI.1963*, Pusisama, 1 ♀ (PS); 15.XI.1963, Kundurumbangara, 60 m, man-biting, afternoon, 3 ♀♀ (JG); 17–18.XI.1963, Pusisama, 9 ♀♀, 1 malaise trapped (JG); 19.XI.1963, Kundurumbangara, malaise trap, 80 m, 23 ♀♀ (PS); 23.XI.1963, same locality, 1 ♀ (JG). *Gizo Island:* 12.VII.1959*, 1–100 m, 6 ♀♀ (JG); 11–18.VII.1964, Gizo Town, in house, 30 m, 1 ♀ (JS); 24.V.1972, New Manda, day man-biting, 1 ♀ (T/0889). *Kolombangara:* 29.VI.1964, Iriri, biting, 3 ♀♀ (JS); 2.VII.1964, same locality, 1 ♀ (JS); 7 & 8.VII.1964, Sandfly Harbour, 50–200 m, malaise trap and biting, 14 ♀♀ (JS); 9.VII.1964, same locality, 2 m, malaise trap, 2 ♀♀, 1 ♂ (JS). *New Georgia Group:* 22.IV.1971, Nusu Lavata I, Wana Wana Lagoon, day man-biting under coconuts, 1 ♀ (T/0447); 27.IV.1971, New Georgia I, Seghe, coconut shell, fresh water, 3 L (T/W. 9). *Santa Isabel:* 14.VI.1960, San Jorge I, Kaulo Plantation, light trap, 2 ♀♀ (CB); 9.IV.1969, Sepi, 1/2 coconut shell, juv (MM, 690409/1). *Russell Islands:* 27.II.1970, Banika I, Lever's Pt., day collection, 2 ♀♀ (T/0110-1). *Florida Group:* 10.VI.1969, Small Nggela, Lake Kakaola, Kombe, 1/2 coconut shell, juv (MM, 690610/3); 13.VIII.1969, Mangolonga I, Takola, coconut husk, juv (MM, 690813/3); 14.VIII.1969, Mangolonga I, Marawari, coconut husk, juv (MM, 690814/1); 15.VIII.1969, Sandfly I, Leitongo, coconut husk, foul water, juv (MM, 690815/4); 7.I.1970, Big Nggela, Vatupura, coconut husk, juv (MM, 700107/2); same except Boromole, coconut husk, juv (MM, 700107/3 & 5), 1 ♂ (T/0008); 9.VIII.1972, Big Nggela, Boromole, day man-biting, edge coconut area, 3 ♀♀ (T/0971-3). *Guadalcanal:* 20.V. 1964, Tambalia, 30 m, 1 ♀ (JS); 21–25.V.1964, same locality, 40 m, 1 ♀ (JS); 15.I. 1970, Honiara, Burns Creek, swamp by golf course, day man-biting, 2 ♀♀ (T/0041-2); 10.III.1972, Koli, day man-biting in shade by stream, 1 ♀ (T/0820); 26.IV.1972, Honiara, Burns Creek swamp, inland of King George VI School, day man-biting, 3 ♀♀ (T/1091-3). *Malaita:* 2.VI.1964, 3 km N of Auki, 30 m, 1 ♀ (JS); 6–13.VI.1964, Dala, 50 m, malaise trap, 1 ♀ (JS); 4.II.1970, Harisi, W Are Are, 1 ♀ (T/0147); 25.XI.1972, nr Pisua, E Are Are, day catch 300 m altitude, 1 ♀, 1 ♂ (T/1011-2).

TRIBE SABETHINI

The sabethines form a very large and very distinct tribe of the Culicinae which is relatively poorly known. In general the tribe is tropical in distribution with only a few species occurring in temperate regions. In the Neotropical region there are several genera and many species, but in the Old World only 4 genera are recognized: *Malaya*, occurring from West Africa to Bougainville and north to Okinawa; *Topomyia*, reported from the Oriental and Indomalayan regions and New Guinea; *Maorigoeldia*, restricted to New Zealand; and *Tripteroides*, the dominant genus, which is chiefly Indomalayan, Australasian and South Pacific and also occurs in the Oriental region and the southern Palaearctic. In the South Pacific *Tripteroides* are known from the Solomons, Santa Cruz Islands, New Hebrides, Loyalties, New Caledonia, Rotuma, Fiji and possibly Samoa.

Genus **Tripteroides** Giles

A complex and heterogeneous genus in which Belkin (1962: 495) recognized 3 subgenera: *Tripteroides*, *Rachisoura* and *Rachionotomyia*. Members of all 3 subgenera occur in the Solomons.

Subgenus **Tripteroides** Giles

This subgenus contains all the ornamented species of the genus. The Solomons members are all in the *bimaculipes* group which also includes *Tp. bonneti* from the Santa Cruz Islands.

BIMACULIPES GROUP

Tripteroides (Trp.) distigma (Edwards, 1925)

Tp. distigma: Belkin, 1962: 502-03.

This species had previously been collected only twice. The holotype female was caught in a house at Tulagi in the Florida Group and a single male was reared from a pupa found in a treehole, in association with *Ae. albolineatus*, at Mboli, also in the Florida Group. In 1964 R. Straatman collected 2 females in malaise traps, 1 at Tatamba, Santa Isabel, and the other at Kira Kira, San Cristobal. Three collections of larvae were made by us at widely separated locations in the Florida Group. The juvenile stages have now been collected from treeholes and from coconut shells and husks. Several of the larvae in our collections had more than 7 unpaired midventral hairs on the siphon, thus indicating that this may not be a reliable character for use in differentiating between the larvae of *Tp. distigma* and those of *Tp. lipovskyi* and *Tp. binotatus*.

Distribution. Santa Isabel, Florida Gp., San Cristobal and ? Santa Catalina.

Collection details. *Santa Isabel:* 5.IX.1964*, Tatamba, 0-50 m, malaise trap, 1 ♀ (RS). *Florida Group:* 8.VI.1969, Small Nggela, Mereka, 1/2 coconut shell, juv (MM, 690608/4); 13.VIII.1969, Buena Vista I, Tadhi, coconut husk, juv (MM, 690813/2); 10.VIII.1972, Big Nggela, Boromole, treehole in freshwater swamp area, 2 L (T/Ng. 4). *San Cristobal:* 13.XI.1964*, Kira Kira, 0-50 m, malaise trap, 1 ♀ (RS). *Santa Catalina:* 7.X.1970*, swamp in center of island, fermented water in a sago palm stump, 1 L prob. *distigma* (MM, 701007/5).

Tripteroides (Trp.) lipovskyi Belkin, 1950

Tp. lipovskyi: Belkin, 1962: 503-04.

The immature stages of *Tp. lipovskyi* have most commonly been found in treeholes and coconut shells. A few collections have been made from bamboo stubble and the leaf axils of sago palms and pandanus. Females have been noted to feed on man. Belkin's personal records include a collection on the Treasury Islands although it does not appear in his published list.

Distribution. Treasury Is, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Malaita.

COLLECTION DETAILS. *Santa Isabel:* 7.IX.1964*, Tatamba, 0-50 m, malaise trap, 1 ♀ (RS). *Russell Islands:* 24* & 26.VIII.1964, Banika I, Yandina, 100 m, malaise trap, 2 ♀♀ (RS). *Florida Group:* 16.XII.1972*, Small Nggela, Salesapa, treehole, stream side, 11 assoc. P (T/Ng. 6). *Malaita:* 3.VII.1964*, Dala, NW Malaita, 1 ♀ (RS); 28.XI. 1972, Maka, S Are Are, axils of very large, saw-edged broadleaf pandanus, 3 L, 2 P (T/ Mala. 12); same data except treehole in buttress, hilltop, altitude 80 m, 1 1 & p (T/Mala. 16) indiv. reared ♀ (T/1086, emerged 23.III.1973).

Tripteroides (Trp.) binotatus Belkin, 1950

Tp. binotatus: Belkin, 1962: 504-05.

The majority of collections have been made on Bougainville where the immature stages were found primarily in treeholes. Other collections have been made from artificial containers, an aroid leaf axil and a ground pool (probably washed out from the normal habitat). An occasional adult has come to man. The published distribution is only from Bougainville although in his personal records Belkin includes a finding from the Treasury Islands. A specimen collected by Slooff in April 1968 on Choiseul does not appear in his 1972 paper. This specimen was identified by one of us and is now in the Bishop Museum.

DISTRIBUTION. Treasury Is and Choiseul. Also Bougainville.

COLLECTION DETAILS. *Choiseul:* IV.1968*, Liu Liu, bred from larvae from iron drum, 1 ♂ (coll. Slooff, code no. 0037).

Tripteroides (Trp.) sp. in *bimaculipes* group, Ugi form.

A single larva collected from a treehole at Pwaunania, Ugi I on 4.VII.1971 by E. S. Horoto shows several characters which resemble *Tp. purpuratus* from Fiji rather than *Tp. distigma* or *Tp. lipovskyi*. Of particular note is the stellate form of hairs 2a on the siphon. However, this single small larva does not justify description as a new species. It was found in association with *Cx. walukasi*, *Ae. albilabris* and *Ae. albolineatus*.

DISTRIBUTION. Ugi I.

COLLECTION DETAILS. *Ugi:* 4.VII.1971*, Pwaunania, treehole, dirty water, 1 L (T/ Mak. 17, coll. E. S. Horoto).

SUBGENUS **Rachionotomyia** Theobald

Rachionotomyia as recognized by Belkin (1962: 506-07) is a complex subgenus which includes all the nonornamented species of *Tripteroides* other than those with modified larval maxillae; the latter are segregated into the subgenus *Rachisoura*. In the South Pacific Belkin recognized 4 groups: the *atripes* group represented by *Tp. solomonis* from the Solomons and possibly New Caledonia; the monotypic *floridensis* group from the Solomons; the *caledonicus* group represented by 4 species from Rotuma, Santa Cruz Is, the New Hebrides, Loyalties and New Caledonia; and the *argenteiventris* group, represented by *Tp. coheni* from the Solomons. Elsewhere the subgenus is widely distributed, occurring from India and the Philippines to Tasmania and the South Pacific.

ATRIPES GROUP

Tripteroides (Rah.) solomonis (Edwards, 1924)

Tp. solomonis: Belkin, 1962: 509-11.—Maffi, 1973b: 47.—Taylor, 1973: 65.

Tp. solomonis is the commonest and most widespread member of the subgenus in the Solomons. It is a general breeder in small natural and artificial containers where the water is frequently extremely foul and may contain large amounts of decaying organic matter. The females can become serious pests around human dwellings when water is left in artificial containers, including septic tanks.

DISTRIBUTION. Treasury Is, Vella Lavella, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Rennell, Malaita, San Cristobal, Santa Catalina.

COLLECTION DETAILS. *Vella Lavella:* 17.XII.1963*, Ulo Crater, 10 m, 1 ♀ (PS). *Santa Isabel:* 1*, 4 & 7.IX.1964, Tatamba, 0-50 m, malaise trap, 2 ♀♀, 1 ♂ (RS). *Russell Islands:* 24.II.1970, Faulo I, Ufa, cubic water tank, juv. (MM, 700224/1). *Florida Group:* 15.X.1964, Big Nggela, Haleta, 0-50 m, treehole, 2 ♂♂ (RS); 17.X.1964, same locality, 250 m, malaise trap, 2 ♀♀ (RS); 13.VIII.1969, Buena Vista I, Tadhi, coconut husk, juv (MM, 690813/2); same date, Mangolonga I, Takola, coconut husk, juv (MM, 690813/4); 15.VIII.1969, Sandfly I, Leitongo, coconut husk, foul liquid, juv (MM, 690815/4); 7.I.1970, Big Nggela, Boromole, coconut husk, juv (MM, 700107/5); 9.VIII.1972, Big Nggela, Boromole, coconut, foul water, 4 L (T/Ng. 2), 1 & p (T/Ng. 2b) indiv. reared ♂ (T/0991), 1 p (T/Ng. 2. 1a) assoc. ♀ (T/0992); XII.1972, Big Nggela, Haroro, coconut, 1 ♂ (T/1022). *Guadalcanal:* 29.VI.1956, Suta, Gold Ridge, 1000 m, 1 ♀ (JG); 8 & 17.V.1964, Roroni, malaise trap, 2 ♀♀ (RS); 13.I.1970, Honiara, in house, ♀♀ man-biting, 5 ♀♀ (T/0028-30, T/0033 & T/0035), 3 ♂♂ (T/0031-2 & T/0034). *Malaita:* 25.IX.1956, Tangatalau, 200 m, 1 ♂ (JG); 28.XI.1972, Maka, S Are Are, day flying, emerging from septic tank vent pipe, 3 ♀♀ (T/1018-20). *San Cristobal:* 13.XI.1964, Kira Kira, 0-50 m, malaise trap, 3 ♀♀ (RS). *Santa Catalina:* 7.X.1970*, swamp in center of island, stagnant water in sago palm stump, 19 L, 2 P (MM, 701007/5), 1 ♂, 1 ♀ (T/0374-5); same date, coastal path west of Ragapu, rat-gnawed coconut husk, foul contents, 6 L (MM, 701007/4).

FLORIDENSIS GROUP

Tripteroides (Rah.) floridensis Belkin, 1950

Tp. floridensis: Belkin, 1962: 511.

This species is known only from a single collection of 11 larvae from a single leaf axil of a wild banana in the Florida Group.

DISTRIBUTION. Florida Gp.

COLLECTION DETAILS. No new specimens found.

ARGENTEIVENTRIS GROUP

Tripteroides (Rah.) coheni Belkin, 1950

Tp. coheni: Belkin, 1962: 518-19.—Taylor, 1973: 65.

This species, which primarily breeds in treeholes and has been collected twice in coconuts, was thought by Belkin to be very scarce, and he noted all known adults had been reared. However, the relatively numerous and widely distributed malaise trap collections by Bishop Museum field workers indicate that, although immature stages of the species are undoubtedly difficult to find, it must, in fact, be relatively abundant.

DISTRIBUTION. Treasury Is, Kolombangara, New Georgia Gp., Santa Isabel, Russell Is, Florida Gp., Guadalcanal, Rennell, Malaita, San Cristobal. Also Bougainville.

COLLECTION DETAILS. *Kolombangara:* 4.VII.1964*, Iriri, 10 m, malaise trap, 1 ♀ (JS); 9.VII.1964, Sandfly Harbour, 2 m, malaise trap, 1 ♀ (JS). *Santa Isabel:* 30.VIII. 1964* and 1, 2, 8 & 15.IX.1964, Tatamba, 0-50 m, malaise trap, 9 ♀♀ (RS). *Russell Islands:* 18.VII.1964*, Pavuvu I, Pepesala, 0-100 m, malaise trap, 1 ♀ (RS). *Florida Group:* 6.X.1964*, Big Nggela, Haleta, 0-100 m, malaise trap, 1 ♀ (RS); 12.X.1964, same locality, 200 m, malaise trap, 1 ♀ (RS); 17.X.1964, same locality, 250 m, malaise trap, 1 ♂ (RS). *Malaita:* 30.VI.1964*, Dala, NW Malaita, 1 ♀ (RS). *San Cristobal:* 9.V.1964*, Wairaha R, 0-100 m, 2 ♀♀ (JS); 7.XI.1964, Kira Kira, 0-200 m, malaise trap, 1 ♀, 1 ♂ (RS); 10, 13 & 20.XI.1964, same locality, 0-50 m, malaise trap, 6 ♀♀ (RS); 9.X.1970, Namugha, Star Harbour, coconut shell, clear water, 1 L (MM, 701009/2).

SUBGENUS **Rachisoura** Theobald, 1910

The subgenus *Rachisoura* is known only from New Guinea, NE Australia and the Solomons. The most distinctive characteristic of *Rachisoura* is the pronounced enlargement of the apical spines of the larval maxilla. The larvae are presumed to use these spines to capture prey. All 3 species from the Solomons were placed in the *filipes* group by Belkin (1962: 520-21).

FILIPES GROUP

Tripteroides (Rac.) mathesoni Belkin, 1950

Tp. mathesoni: Belkin, 1962: 523-24.

A relatively uncommon species which breeds chiefly in leaf axils of wild and cultivated aroids. The adults are seldom seen in the field except around aroids where they apparently rest. Females have not been recorded biting man.

DISTRIBUTION. New Georgia Gp., Russell Is, Guadalcanal, Malaita, San Cristobal. Also Bougainville.

COLLECTION DETAILS. *Russell Islands:* 25.VII.1964*, Banika I, 100 m, malaise trap, 1 ♀ (RS). *Malaita:* 25.XI.1972*, nr Pisua, E Are Are, wild taro axil, 300 m altitude, 1 l & p (T/Mala. 8) indiv. reared ♂ (T/1013); same date, Ote, wild taro axil, altitude 250 m, 1 L, 1 P (T/Mala. 9), 1 l & p (T/Mala. 9a) indiv. reared ♀ (T/1017). *San Cristobal:* 12.IV.1972*, Maniparegho, axil of wild taro on river bank, 2 L, 1 P (T/Mak. 44).

Tripteroides (Rac.) stonei Belkin, 1950

Tp. stonei: Belkin, 1962: 524-25.

A fairly common and widely distributed species whose females occasionally attack man during the day. Adults may be seen in the field resting on coconut shells, and we have collected them resting in native houses. The immature stages can be found in treeholes, bamboo stubble and particularly, coconut shells, husks and fallen spathes. They are also known from various artificial containers.

DISTRIBUTION. New Georgia Gp., Rendova, Florida Gp., Guadalcanal, Malaita, San Cristobal, Ugi.

COLLECTION DETAILS. *Florida Group:* 6.X.1964*, Big Nggela, Haleta, 0–100 m, malaise trap, 1 ♀ (RS); 13.VIII.1969, Mangolonga I, Kiova, coconut husk, juv (MM, 690813/4); 9.VIII.1972,Big Nggela, Boromole, coconut, semi-foul water, 1 l & p (T/Ng. 2a) indiv. reared ♂ (T/0990). *Guadalcanal:* II.1971, Honiara, in house, 1 ♀ (T/0368); 6.II.1973, Dae Dae, Berande R, cut green bamboo, 1 p assoc. ♂ (T/G. 31), 1 ♀ (T/1026). *Malaita:* 6*–13.VI.1964, Dala, 50 m, malaise trap, 2 ♀♀ (JS); 20.V.1964 & 20.VI.1964, same locality, malaise trap, 2 ♀♀ (RS). *San Cristobal:* 20.XI.1964*, Manowiriwiri, 0–50 m, malaise trap, 1 ♀ (RS); 9.X.1970, Namugha, Star Harbour, in foothills, coconut shell, decayed matter in water, 1 L (MM, 701009/1); 15.X.1970, Kira Kira, coconut grove W of Pui Pui R, 1/2 coconut husk, 1 L (MM, 701015/2); III.1971, Waimasi, indoor day-resting, 2 ♀♀ (T/0395-6); 4.V.1972, Arohane, indoor day-resting, 1 ♀ (T/0854); 25.VII. 1972, same locality, outdoor day collection, 1 ♀ (T/0927), indoor day-resting, ? part blood-fed, 1 ♀ (T/0950). *Ugi:* 14.X.1970*, Hakanipua, coconut husk, foul water, 1 L, 2 P (MM, 701014/2).

Tripteroides (Rac.) torokinae Belkin, 1950

Tp. torokinae: Belkin, 1962: 525–26.

This species quite closely resembles *Tp. stonei* and is its counterpart in the northern Solomons. The immature stages have been collected in treeholes. Nothing is known of the adult bionomics.

DISTRIBUTION. Treasury Is. Also Bougainville.

COLLECTION DETAILS. No further collections.

GEOGRAPHICAL TREATMENT

In the following sections we have collated all the information on the mosquito fauna that we have been able to gather for each island or island group. The brief geographical descriptions are based primarily on our personal knowledge together with data on land area and the human population from the February 1970 national census report (as summarized in the *British Solomon Islands, Report for the year 1970*, H.M.S.O., London, 1972).

The data for the following islands were not separated in the census report and, thus, are given below:

The Treasury Islands and Shortland Islands have a total land area of 414 km^2 and around 2000 inhabitants (including some 350 people of Gilbertese origin).

Vella Lavella, Ranongga, Simbo and Gizo islands have a total land area of 907 km^2 and about 10,000 inhabitants.

Kolombangara, Rendova, Tetepare and the New Georgia Group have a total land area of 4144 km² and about 14,000 inhabitants.

San Cristobal, Ugi, The Three Sisters, Santa Ana and Santa Catalina have a total land area of 3497 km² and over 11,000 inhabitants.

In each section the geographical description is followed by a list of the mosquito species now known from the particular island. Each species name is followed by one or more reference numbers which relate to the final part of the section, COLLECTIONS, which gives brief details, in chronological order, of the various collectors and the places where they made their collections.

Treasury Islands

Mono and the much smaller Stirling, which are known, together with a few tiny islets, as the Treasury Islands, are the westernmost islands of the Solomons (7°25'S and 155° 35'E). The highest point is on Mono, which rises to 355 m. The only reported mosquito collections were those made around the World War II encampments of the U.S. Forces by W. J. Perry and J. H. Paullus (Perry 1949, 1950, Belkin 1962).

SPECIES. *Bi. hollandi* 2; *An. farauti* 1, 2, 3; *An. lungae* 2, 3; *An. solomonis* 3; *Ur. quadrimaculata* 2, 3; *Ur. civinskii* 3; *Cx. quinquefasciatus* 2, 3; *Cx. whittingtoni* 2, 3; *Cx. sitiens* 1; *Cx. annulirostris* 1, 2, 3; *Cx. halifaxii* 1; *Cx. belkini* 2, 3; *Cx. pullus* 2, 3; *Cx. solomonis* 1, 2, 3; *Ae. albilabris* 1, 2, 3; *Ae. bougainvillensis* 3; *Ae. franclemonti* 2, 3; *Ae. solomonis* 3; *Ae. carmenti* 2; *Ae. lineatus* 2; *Ae. aegypti* 3; *Ae. albolineatus* 1, 2, 3; *Ae. quasiscutellaris* 1, 2, 3; *Ar. breinli* 1, 2, 3; *Tp. lipovskyi* 3; *Tp. binotatus* 3; *Tp. solomonis* 1, 2, 3; *Tp. coheni* 2, 3; *Tp. torokinae* 2. 3.

COLLECTIONS. All presumably by W. J. Perry and J. H. Paullus in 1944 on Stirling and Mono. The species list is made up from 3 sources: 1, the published list of Perry (1949); 2, the published list of Belkin (1962); and 3, the personal records made by Belkin.

Shortland Islands

The Shortland group (between 6°45'–7°5'S and 155°40'–156°10'E), which lies a few km to the east of Bougainville, comprises 2 main islands, Alu and Fauro, and numerous smaller islands. Alu is a relatively low lying island, with a maximum elevation of 206 m, whereas Fauro is a narrow, precipitous island rising to 587 m. The smaller islands such as Ballalae, which has a small airfield, are mainly coralline. There are no prior records of mosquito collections.

SPECIES. *An. farauti* 1; *Cx. belkini* 2; *Cx. perryi* 2; *Ae. knighti* 2; *Ar. breinli* 3.

COLLECTIONS. 1, various malaria entomology surveys 1965 onwards; 2, B. Taylor, March 1973 at Samanagha I; and 3, B. Taylor, March 1973 on Ballalae I.

Choiseul

The northern and westernmost of the major islands, Choiseul is a long (150 km), relatively narrow (maximum width 35 km) island with a central longitudinal mountain chain rising to 1067 m. The coastal flatland area is narrow with the exception of the some-

what elevated coral shelf at the northwestern end including the islands of Choiseul Bay; on one of the latter, Taro Island, there is a small airfield. The total land area, including Waghena (Vaghena), is 3108 km². The relatively small human population of about 7000 lives principally on the western 1/2 of the north and south coasts and in a few inland villages. There are no prior mosquito reports other than Slooff (1972).

SPECIES. *Bi. hollandi* 1, 2; *An. farauti* 1, 2, 3; *An. koliensis* 1, 2; *An. lungae* 1, 2, 3; *An. nataliae* 2; *An. solomonis* 2; *Ur. quadrimaculata* 1; *Ur. barnesi* 1; *Cx. whittingtoni* 1; *Cx. sitiens* 1; *Cx. annulirostris* 1, 2, 3; *Cx. squamosus* 2; *Cx. halifaxii* 1; *Cx. pullus* 1; *Cx. franclemonti* 3; *Cx. lairdi* 1, 2; *Cx. solomonis* 2, 3; *Cx. walukasi* 1; *Cx. perryi* 3; *Ae. longiforceps* 3; *Ae. albilabris* 1, 2, 3; *Ae. bougainvillensis* 3; *Ae. knighti* 3; *Ae. solomonis* 3; *Ae. vigilax* 1; *Ae. carmenti* 1; *Ae.* subgenus undetermined Bougainville form 1; *Ae. alboscutellatus* 1, 2; *Ae. dasyorrhus* 3; *Ae. albolineatus* 1, 2, 3; *Ae. quasiscutellaris* 2, 3; *Ar. breinli* 1; *Tp. binotatus* 1.

COLLECTIONS. 1, R. Slooff and entomology technician, January & May 1966, April-May 1968 and June 1968, most findings other than of *Bi. hollandi* and *Anopheles* spp. were in the Choiseul Bay area at the northwestern tip of Choiseul; 2, M. Maffi, February-March 1969 at Kanata, Koloe, Luluvato, Luti, Nuatambu, Pangoe, Papara, Penetari, Susupo, Tamata, Voza and Vundutaru; and 3, B. Taylor, March 1973 at Bubukuana, Moli, Nukiki and Poro Poro.

NOTES. Slooff (1972) reported *Ae. varuae*, but in our opinion this is extremely unlikely and probably represents a misidentification of *Ae. quasiscutellaris*. Although *Tp. binotatus* was collected by Slooff it was not reported by him in his paper (1972).

Waghena (Vaghena)

A relatively small (10 km diam.) island of elevated coral with a maximum height of 61 m. There are bauxite deposits of commercial significance on the island. The over 660 inhabitants, nearly all of Gilbertese origin, live in 3 villages on the southern coast. There are no previous mosquito records.

SPECIES. *An. farauti* 1; *An. lungae* 2; *Ur. quadrimaculata* 1; *Cx. annulirostris* 1; *Cx. pullus* 1; *Ae. albilabris* 2; *Ae. lineatus* 1; *Ae. dasyorrhus* 2; *Ae. albolineatus* 1; *Ae. quasiscutellaris* 1, 2.

COLLECTIONS. 1, M. Maffi, February 1969, at Nukumaroro; and 2, M. Maffi, March 1969 at Cookson.

Vella Lavella

A moderately large island with a central massif rising to 792 m. The island is some 35 km across from southeast to northwest and 25 km from northeast to southwest. On Vella Lavella most people live on the southeast coast where the coastal shelf is widest. At the southern end there are fairly extensive agricultural operations and a small airfield. The very few previous mosquito collections are reported by Marks (1947) and Belkin (1962). Anopheline surveys conducted during World War II were summarized by Perry (1950).

SPECIES. *Bi. hollandi* 0, 4; *An. farauti* 2, 4; *An. lungae* 3, 4; *Ur. civinskii* 3; *Cx. sitiens* 4; *Cx. halifaxii* 1; *Cx. fragilis* 3; *Cx. pullus* 3; *Ma. lutea* 3; *Ae. longiforceps* 3; ? *Ae. bougainvillensis* 1?; *Ae. carmenti* 3; *Ae. lineatus* 1; *Ae. alboscutellatus* 3; *Ae. quasiscutellaris* 3, 4; *Ar. breinli* 3; *Tp. solomonis* 3.

COLLECTIONS. 0, we have been unable to find the record Belkin includes in his conspectus; 1, specimens in Sydney (School of Public Health) labelled LJD (L. J. Dumbleton), April 1956?; 2, malaria entomology survey in 1962–63; 3, P. Shanahan & J. L. Gressitt, November 1963 at Gingola, Kow, Pusisama, Ulo Crater, Kundurumbangara and nr Arewana; and 4, M. Maffi, July 1969 at Barakoma, Danbanito, Karakesa, Leona and Vonunu.

NOTES. The *Ae. bougainvillensis* record was quoted from Marks (1947) by Belkin (1962) who considered this could be one of the other species in the complex, e.g., *Ae. neogeorgianus*, *Ae. hollingsheadi* or *Ae. schlosseri*.

Ranongga

A relatively small narrow island running north to south for about 30 km. There is a central ridge rising to 610 m. The people all live on the narrow coastal strip. The only prior mosquito record is that of Slooff (1972).

SPECIES. *An. farauti* 1, 3; *Ur. civinskii* 3; *Cx. quinquefasciatus* 3; *Ae. albolineatus* 2.

COLLECTIONS. 1, malaria entomology survey, 1962–63; 2, R. Slooff, 196?, at Emu Harbour and Vori; and 3, B. Taylor, April 1971 at Buri.

Simbo

A small volcanic island with a dormant volcano, fumaroles and hot springs. The maximum elevation is 335 m. The people live in villages scattered all over the island. There are no previous mosquito records.

SPECIES. *An. farauti* 1, 2; *Cx. laffooni* 2; *Cx. solomonis* 2.

COLLECTIONS. 1, malaria entomology surveys, 1962–63; and 2, M. Maffi, July 1969 at Malalomo.

Gizo

A small island which rises to about 200 m. Gizo Town is the administrative center for the Western District and is also a port of call for overseas vessels. There is a small airfield on an adjacent coral island, Nusatupe. Forestry operations have been extensive in the central area. Previously reported mosquito collections were by E. G. Sayers in 1930 and E. S. Brown in 1954 (both in Belkin 1962) and by Slooff (Slooff & Marks 1965, Slooff 1972).

SPECIES. *Bi. hollandi* 6; *An. farauti* 4, 7, 8; *Ur. civinskii* 8; *Ur. barnesi* 8; *Cx. quinquefasciatus* 5; *Cx. annulirostris* 8; *Cx. squamosus* 7; *Cx. halifaxii* 1; *Cx. pullus* 1; *Cx. lairdi* 8; *Ae. longiforceps* 6; *Ae. painei* 8; *Ae. carmenti* 8; *Ae. lineatus* 1; *Ae. quasiscutellaris* 2, 7; *Ar. breinli* 3, 5, 8.

COLLECTIONS. 1, E. G. Sayers, 1930 at Bilua; 2, E. S. Brown, 1954; 3, J. L. Gressitt, July 1959 in Gizo Town; 4, malaria entomology surveys, 1962–63; 5, J. & M. Sedlacek,

July 1964 in Gizo Town; 6, R. Slooff, May 1964 at New Manda and Sageragi; 7, B. Taylor, April 1971 in Gizo Town and Titiana; and 8, B. Taylor, May–June 1972 at New Manda.

NOTES. Belkin's conspectus [1962 (2): 10] includes a record of *Cx. fragilis*, however, this may be an error, as in Belkin's personal records there is an entry for *Cx. pullus* (collected by E. G. Sayers) but no entry for *Cx. fragilis*.

Kolombangara

A moderately large island comprising a single extinct volcanic cone which reaches a height of 1768 m at the crater rim. The inhabitants all live in coastal villages or in the labor camps of the large scale timber operations and coconut plantations on the southern slopes. There is a small airfield near the port of Ringi Cove. Previous mosquito records are by Paine in 1928 (Paine & Edwards 1929) and by the U. S. Forces in 1943–44, and E. S. Brown in 1954 (Belkin 1962).

SPECIES. *An. farauti* 1, 6; *An. lungae* 5; *Cx. sitiens* 2; *Cx. annulirostris* 2; *Cx. fragilis* 4; *Cx. solomonis* 1; *Ad. catasticta* 2; *Ae. longiforceps* 5; *Ae. albilabris* 3; *Ae. painei* 1; *Ae. carmenti* 3; *Ae. lineatus* 1; *Ae. albolineatus* 3; *Ar. breinli* 3, 5; *Tp. coheni* 5.

COLLECTIONS. 1, R. W. Paine, October 1928 at Lady Lever Plantation; 2, U. S. Forces, J. G. Franclemont, November 1943 and October 1944, and W. G. Downs in the Vila area; 3, E. S. Brown, October 1954; 4, P. Shanahan, February 1964 at Pepele; 5, J. & M. Sedlacek, June–July 1964 at Iriri and Sandfly Harbour; and 6, malaria entomology survey, June 1965.

New Georgia Group

A large group of islands running northwest to southeast. The major islands are New Georgia, rising to 1006 m and 80 km long by 50 km at the wider western end; Vangunu, some 30 km in diameter and rising to 1108 m; and Nggatokae, about 10 km in diameter with a highest point of 888 m. Very extensive coastal lagoons stretch for over 100 km off the eastern and northeastern coast (the Marovo lagoon), off the southern coast (Roviana lagoon) and off the western extremity [Wana Wana lagoon which includes 2 fairly extensive flat coral islands, Kohinggo (Arundel) and Wana Wana (Vona Vona)]. The lagoon coasts and islands are the main population centers, although there is a Mission and Government station around the airfield at Munda. There is a large-scale timber operation in the Kalivarana area on Southern New Georgia and this is expanding onto Vangunu. Coconut plantations are found on many of the lagoon islands, but in the main the coastal areas of the lagoons have extensive mangrove swamps.

Previously reported mosquito collections were by E. G. Sayers in 1929 (Paine & Edwards 1929) and in 1930, by the World War II U.S. Forces entomologists in 1943–44 and by E. S. Brown in 1954, all of which were reported by Belkin (1962). R. Slooff (1972) made a few collections around Munda. A collection by R. J. A. W. Lever in 1936 has not been reported before.

SPECIES. *Bi. hollandi* 3, 7; *An. farauti* 1, 3, 6; *An. lungae* 1, 3; *An. nataliae* 3; *Ur. quadrimaculata* 1, 4; *Ur. civinskii* 3; *Ur. lateralis* 3; *Ur. barnesi* 3; *Ur. solomonis* 1, 3; *Cx. quinquefasci-*

atus 3, 8; *Cx. whittingtoni* 3; *Cx. sitiens* 3, 5, 8; *Cx. annulirostris* 1, 3; *Cx. squamosus* 3; *Cx. halifaxii* 3; *Cx. belkini* 3; *Cx. perkinsi* 3; *Cx. papuensis* 3; *Cx. fragilis* 1, 3; *Cx. pullus* 1, 3; *Cx. franclemonti* 3; *Cx. lairdi* 3; *Cx. solomonis* 3; *Cx. walukasi* 1, 3; *Cx. becki* 3; *Cx.* (*Lop.*) *17* 3; *Cx.* (*Lop.*) *18* 3; *Cx.* (*Lop.*) *22* 3; *Fi. solomonis* 3; *Ma. lutea* 1, 3; *Ae. becki* 3; *Ae. longiforceps* 3; *Ae. albilabris* 1, 3, 8; *Ae. argyronotum* 3; *Ae. bougainvillensis* 1, 3; *Ae. franclemonti* 3; *Ae. hollingsheadi* 3; *Ae. knighti* 3; *Ae. neogeorgianus* 1, 3; *Ae. schlosseri* 3; *Ae. solomonis* 1, 3; *Ae. mcdonaldi* 3; *Ae. painei* 3; *Ae. imprimens* 3; *Ae. cuccioi* 3; *Ae. carmenti* 3; *Ae. lineatus* 3; *Ae. mccormicki* 3, 4; *Ae. alboscutellatus* 3, 5; *Ae. dasyorrhus* 3, 8; *Ae. aegypti* 1; *Ae. albolineatus* 1, 3, 4, 7, 8; *Ae. quasiscutellaris* 1, 3, 4, 8; *Ar. breinli* 1, 2, 3, 4; *Tp. lipovskyi* 3; *Tp. solomonis* 1, 3; *Tp. coheni* 3; *Tp. mathesoni* 3; *Tp. stonei* 3.

COLLECTIONS. 1, E. G. Sayers, 1929–30 in Roviana Lagoon; 2, R.J.A.W. Lever, August 1936 at Nautu; 3, U. S. Forces including J. G. Franclemont, November 1943 to December 1944 at Munda, Sasavele and elsewhere in western New Georgia, C. O. Berg, at Seghe Point and Vangunu, and W. G. Downs; 4, E. S. Brown, 1954 at Wana Wana and Roviana; 5, J. L. Gressitt, July 1959 at Munda; 6, malaria entomology surveys in 1962–63; 7, R. Slooff, 196? at Munda and Lambete; and 8, B. Taylor, April 1971 at Munda, Nusu Lavata (Wana Wana), Sasavele and Seghe.

NOTES. The *Ae. bougainvillensis* collections by Sayers and the U. S. Forces' workers are from Belkin's personal records as is the *Ae. schlosseri* finding. Slooff's report (1972) of *Ae. varuae* from Lambete is not included here, as in our opinion (see *Ae. varuae* in the Systematic Treatment) this is a misidentification of *Ae. quasiscutellaris*.

Rendova and Tetepare

Rendova is 30 km across from northeast to southeast, and some 15 km wide, excluding the southern peninsula; it rises to 1063 m. The inhabitants all live near the coast and there are fairly extensive coconut plantations. Tetepare, which is 25 km long and only 7 km across with a highest point of 405 m, is almost uninhabited except at the western end where there is a coconut plantation. The only previously reported mosquito collections were by the World War II U. S. Forces' entomologists and by E. S. Brown in 1954 (both in Belkin 1962).

SPECIES. *An. farauti* 3; *Ur. quadrimaculata* 1, 2; *Cx. halifaxii* 1, 2; *Cx. belkini* 1; *Cx. fragilis* 1; *Cx. solomonis* 1; *Cx.* (*Lop.*) *17* 1; *Cx.* (*Lop.*) *22* 1; *Ae. albilabris* 1; *Ae. franclemonti* 1; *Ae. knighti* 1; *Ae. lineatus* 1; *Ae. mccormicki* 2; *Ae. albolineatus* 1, 2; *Ae. quasiscutellaris* 1, 2; *Ar. breinli* 1, 2; *Tp. stonei* 1, 2.

COLLECTIONS. 1, U. S. Forces, W. G. Downs in July 1943, K. L. Knight in August 1943 and J. G. Franclemont in January 1944; 2, E. S. Brown, October 1954, including at Menakosopo; and 3, malaria entomology surveys, July 1965.

Mborokua

A very small and isolated extinct volcanic island, with a height of 360 m at the crater rim, lying 9°2'S and 158°45'E. It is uninhabited except for occasional travelers between New Georgia and the Russell Islands. There are no previous mosquito records.

SPECIES. *Ur. quadrimaculata.*
COLLECTION. B. Taylor, November 1970.

Santa Isabel and San Jorge

Santa Isabel is a long (some 240 km including the islands of the northwestern tip), narrow (maximum width 25 km) island with a central longitudinal mountain range rising to 1219 m. The total land area is 4015 km^2. Except for the flat islands of the northwestern tip, with an extensive mangrove lagoon area, which supports the very large village of Kia (up to 1000 people), and the relatively flat area of the southeastern end of the north coast (where the remainder of the 9000 people is mainly concentrated), the coastal flat strip is very narrow and the villages of the north and south coasts are few and widely scattered. Timber operations have been extensive at Allardyce and there are scattered coconut plantations. There is a Government station at Buala on the north coast with a small airfield offshore on Fera Island. San Jorge Island, which lies off the southern tip of Isabel, is uninhabited, except for the village of Talise, but there are mineral deposits, mainly of nickel ore, of commercial value.

Previous mosquito collections were by C.H.G. White in 1925 and E. S. Brown in 1955 (both reported by Belkin 1962), by R. W. Paine in 1928 (Paine & Edwards 1929) and by R. Slooff (1972).

SPECIES. *An. farauti* 1, 6, 7; *An. punctulatus* 5, 6; *An. koliensis* 6; *An. lungae* 5, 7; *An. nataliae* 7; *An. solomonis* 5, 7, 8; *Ur. quadrimaculata* 5, 8; *Ur. civinskii* 5; *Ur. barnesi* 5, 8; *Cx. pullus* 5; *Cx. lairdi* 8; *Cx. becki* 8; *Ae. becki* 4; *Ae. longiforceps* 4, 5; *Ae. albilabris* 5; *Ae. hollingsheadi* 5; *Ae. solomonis* 5; *Ae. painei* 8; *Ae. carmenti* 3, 5; *Ae. dasyorrhus* 4, 8; *Ae. albolineatus* 2, 4, 5, 8; *Ae. gurneyi* 5; *Ae. quasiscutellaris* 5, 8; *Ar. breinli* 3, 4, 8; *Tp. distigma* 5; *Tp. lipovskyi* 5; *Tp. solomonis* 5; *Tp. coheni* 5.

COLLECTIONS. 1, C.H.G. White, July 1925 at Suvana; 2, R. W. Paine, October 1928 at Fulakoro; 3, E. S. Brown, February 1955 at Fera I and Ghatere; 4, C. W. O'Brien, June–July 1960 at Buala, Molao, Nagala and Kaulo Plantation (San Jorge I); 5, R. Straatman, August–September 1964 at Buala, Tanatahi R and Tatamba; 6, malaria entomology surveys between August 1966 and March 1969; 7, R. Slooff, 1967 at Kesao; and 8, M. Maffi, April 1969 at Dadala, Ghalata, Hurupelo, Samasodu, Sepi, Susubona and Talise (San Jorge I).

Russell Islands

The Russell Islands comprise 2 major islands, Pavuvu and Banika (rising to 543 m and 206 m, respectively), separated by a narrow channel and numerous small fringing coral islands. The total land area is 130 km^2. There are extremely extensive coconut plantations with which most of the 3000 or so people are associated. In uncleared coastal areas mangrove swamps are dominant. There is an airfield at Yandina, which is also a port of call for overseas vessels.

Previously recorded mosquito collections were by R. W. Paine in 1928 (Paine & Edwards 1929), J. M. Heydon in 1924, the World War II U. S. Forces' entomologists and

E. S. Brown in 1954 (all in Belkin 1962) and R. Slooff (1972). The collections by J. M. Heydon are probably those referred to without any details by Edwards (1926). The collections by R.J.A.W. Lever in 1933 do not appear to have been reported before.

SPECIES. *Bi. hollandi* 4; *An. farauti* 2, 4, 5, 7, 8; *Ur. quadrimaculata* 2, 4, 6; *Ur. civinskii* 4, 8; *Ur. barnesi* 4; *Ur. solomonis* 2, 4; *Cx. quinquefasciatus* 4, 6, 8; *Cx. sitiens* 4, 8; *Cx. annulirostris* 2, 4, 7, 8; *Cx. squamosus* 4; *Cx. halifaxii* 4; *Cx. pullus* 4, 6; *Cx. lairdi* 2, 4, 8; *Cx. walukasi* 4; *Ad. catasticta* 3, 8; *Ho. solomonis* 6; *Fi. solomonis* 4; *Ma. lutea* 4, 6; *Ae. perryi* 0; *Ae. longiforceps* 2; *Ae. albilabris* 4; *Ae. bougainvillensis* 0; *Ae. hollingsheadi* 6; *Ae. solomonis* 6, 8; *Ae. painei* 4; *Ae. carmenti* 2, 8; *Ae. lineatus* 2, 3, 4, 6; *Ae. dasyorrhus* 8; *Ae. aegypti* 0; *Ae. albolineatus* 1, 2, 4, 5, 8; *Ae. gurneyi* 4, 8; *Ae. quasiscutellaris* 2, 4, 5, 6, 8; *Ar. breinli* 2, 8; *Tp. lipovskyi* 6; *Tp. solomonis* 2, 4, 8; *Tp. coheni* 6; *Tp. mathesoni* 6.

COLLECTIONS. 0, see notes below; 1, J. M. Heydon, 1924; 2, R. W. Paine, September 1928 at Cape Marsh on Banika I, at Faiami on Pavuvu I and on Ufa I; 3, R.J.A.W. Lever, July 1933 at Yandina; 4, U. S. Forces, including W. G. Downs, April 1943, and R. B. Eads, 1944; 5, E. S. Brown, June 1954 at Faielau; 6, R. Straatman, July 1964 at Yandina and Pepesala; 7, R. Slooff, November 1965 and March 1966 at numerous localities (*Cx. annulirostris* only at Yandina); and 8, M. Maffi and B. Taylor, February 1970 at Alokun, Banika, Faielau, Fly Harbour School, Lever's Point, Louna, Nukufero, Ufa and Yandina.

NOTES. The *Ur. solomonis* and *Ae. albilabris* findings are in Belkin's personal records but not in his 1962 text. *Ae. perryi* and *Ae. aegypti* are given in Belkin's published list but do not appear in his personal records. The *Ae. bougainvillensis* finding is quoted by Belkin (1962) from Marks (1947) and Belkin commented that the record could be of other species in the complex, possibly *Ae. neogeorgianus*, *Ae. hollingsheadi* or *Ae. schlosseri* (the collection may have been by L. J. Dumbleton at Banika).

Florida Group

A moderately sized group of islands with a total land area of 389 km^2. The 2 major islands, Big Nggela (Nggela Sule) and Small Nggela (Nggela Pile) are separated by the narrow Boli Passage; both rise to almost 400 m. At the western end there are numerous smaller islands, principally Sandfly, Mangalonga and Buena Vista, and extensive coral reefs encircle most of the group. Mangrove swamps are common around much of the coast. The island of Tulagi off the southern coast of Big Nggela was the seat of Government prior to 1945 and is now a center for marine engineering and a fishing industry. The total inhabitants of the group number over 5500 all of whom live near the coast.

Previously reported mosquito collections are by G.C.H. Davies in 1914, A. G. Carment in 1923-25 and C. H. White in 1925 (all in Edwards 1924, 1925, 1926), S. M. Lambert in 1929, the World War II U. S. Forces' entomologists and M. V. Natuna in 1954 (all in Belkin 1962), D. Bonnet in 1956 (Belkin 1962, 1965) and R. Slooff (1972). Anopheline collections in 1944 by R. Kuntz were described by Perry (1950).

SPECIES. *Bi. hollandi* 11, 12; *An. farauti* 1, 2, 5, 10, 11, 12, 13, 14, 15; *An. koliensis* 10; *An. lungae* 5, 10; *An. solomonis* 12; *Ur. quadrimaculata* 3, 4, 5, 6, 9, 12, 13, 15; *Ur. civinskii* 5, 6, 13; *Ur. lateralis* 14; *Ur. barnesi* 5, 11; *Cx. quinquefasciatus* 2, 4; *Cx. whittingtoni* 11; *Cx. sitiens* 5, 12, 14; *Cx. annulirostris* 5, 6, 11, 12; *Cx. halifaxii* 12, 13; *Cx.* (*Acl.*) *sp.*? 14; *Cx. pullus* 5, 12; *Cx. oweni* 13; *Cx. laffooni* 5, 13; *Cx. solomonis* 5, 7, 11, 12, 13; *Cx. walukasi* 5, 7, 12, 14; *Cx.* (*Lop.*) *18* 5, 7; *Cx.* (*Lop.*) *19* 5; *Cx.* (*Lop.*) *22* 14; *Ae. perryi* 8, 14; *Ae. longiforceps* 6, 14; *Ae. albilabris* 2, 3, 5, 9, 12, 14; *Ae. bougainvillensis* 2; *Ae. knighti* 14; *Ae. schlosseri* 5; *Ae. solomonis* 9; *Ae.* (*Fin.*) *23* 6; *Ae. carmenti* 5, 9; *Ae. lineatus* 5; *Ae. dasyorrhus* 3, 11, 12, 14; *Ae. aegypti* 2, 3; *Ae. albolineatus* 3, 5, 7, 9, 11, 12, 14, 15; *Ae. gurneyi* 9; *Ae. quasiscutellaris* 2, 3, 4, 5, 7, 9, 11, 12, 13; *Ar. breinli* 2, 3, 5, 11, 12, 13, 14; *Tp. distigma* 2, 7, 11, 12, 14; *Tp. lipovskyi* 15; *Tp. solomonis* 2, 3, 5, 9, 12, 13, 14, 15; *Tp. floridensis* 5; *Tp. coheni* 9; *Tp. stonei* 9, 12, 14.

COLLECTIONS. 1, G.C.H. Davies, 1914 at Tulagi; 2, A. G. Carment, 1923–25 at Tulagi; 3, C.H.G. White, August 1925 at Port Purvis and Siota; 4, S. M. Lambert, 1929 at ? Tulagi; 5, U. S. Forces including R. Kuntz in 1944 around Tulagi and Gavutu Harbour and K.L. Knight, December 1943 at Halavo and Siota; 6, M. V. Natuna, April 1954 at Halavo; 7, D. Bonnet, September 1956 at Mboli; 8, C. W. O'Brien, September 1960 at Ha'a and Takopekope, Big Nggela, and at Hanuvaivine, Small Nggela; 9, R. Straatman, October 1964 at Haleta, Big Nggela; 10, R. Slooff, between 1964 and 1967 at numerous locations (*An. lungae* only at Vunuha); 11, M. Maffi, June 1969 at Tulagi and several locations on Small Nggela; 12, M. Maffi, August 1969 at several locations on Sandfly I, Mangalonga I and Buena Vista I; 13, M. Maffi, January 1970 at Boromole, Haleta and Vatupura, Big Nggela, and Ndandala, Small Nggela; 14, B. Taylor, August 1972 at Boromole; and 15, B. Taylor, December 1972 at Haroro, Big Nggela, and Salesapa, Small Nggela.

NOTES. The collections (5) of *Ae. carmenti* and *Ae. lineatus* appear in Belkin's text (1962) but not in his personal records. *Ur. barnesi* (Collection 5) is in Belkin's personal records but not his text (1962). The larvae collected by Maffi and identified by us as *Cx. oweni* may be specimens of *Cx.* (*Lop.*) *18* Solomons rock pool forms. R. W. Paine in 1928 saw larvae of what he took to be *Cx. quinquefasciatus* at Tulagi (Paine & Edwards 1929).

Savo

A small dormant volcanic island, at 9°10'S and 159°48'E, which rises to 484 m at the crater rim. The diameter of the island is about 6 km and the total land area is 39 km^2. The principal streams originate from hot springs. The population of about 1400 is centered near the coast. The only previously reported mosquito collections were by R. H. Black (1952) and M. Laird (1956).

SPECIES. *An. farauti* 1, 3; *An. punctulatus* 1, 2; *Ur. quadrimaculata* 3; *Cx. annulirostris* 3; *Cx. pullus* 3; *Cx. solomonis* 3; *Ae. quasiscutellaris* 3.

COLLECTIONS. 1, R. H. Black, 1952; 2, M. Laird, August 1953 at Olemala; and 3, M. Maffi, November–December 1968 and December 1969, several localities.

Guadalcanal

The largest island, area 5646 km², of the Solomons. It is about 150 km long and up to 45 km wide with a large mountain range in the southern 1/2 of the island. The highest point is 2330 m at Mt Popomanaseu. On the north central area there are extensive plains which are coming under intensive cultivation with a large rice farm, an oil palm plantation and cattle ranches. Well established coconut plantations extend more or less continuously along the north coast from Maravovo to Marau. Honiara, on the north coast, is the capital and seat of Government with an urban population of 17,000. The population elsewhere on the island is over 24,000. The majority of inhabitants live near the coast although there are fairly substantial inland populations in the central and eastern mountains. Honiara is the major port for foreign-going vessels and there is an international airport at Henderson Field. Small internal airfields are at Marau, Avu Avu and Babanakira.

More mosquito collections have been made on Guadalcanal than on any of the other islands. The previous records include the work of A. G. Carment in 1923–25 (Edwards 1924, 1926), R. W. Paine in 1928 (Paine & Edwards 1929), R. H. Black (1952) and M. Laird in 1953 (Laird 1955, 1956). Belkin (1962) summarized the findings of J. A. Kusche and W. M. Gifford in 1920–21, R.J.A.W. Lever in 1932–36, the World War II U. S. Forces' entomologists, J. S. Phillips in 1953–54, E. S. Brown in 1954–56, M. V. Natuna in 1954, J. de Beaux in 1956 and J. L. Gressitt in 1956. M. Willowes made collections in 1933 which were reported by S. M. Lambert in a "Health Survey of the B.S.I.P." submitted to the High Commissioner for the Western Pacific in 1933 (unpubl.). R. Slooff (1972) made the most recently reported collections.

Species. *Bi. hollandi* 7, 9, 19, 20, 21, 22, 23; *An. farauti* 2, 7, 8, 9, 10, 11, 13, 17, 19, 20, 21, 22, 23; *An. punctulatus* 7, 9, 11, 17, 19, 23; *An. koliensis* 2, 7, 8, 17; *An. lungae* 7, 19, 22, 23; *An. nataliae* 7, 18, 19, 21; *An. solomonis* 7, 9, 19, 20, 23; *Ur. quadrimaculata* 3, 7, 9, 11, 12, 18, 22; *Ur. wysockii* 7; *Ur. sexaueri* 7; *Ur. civinskii* 3, 7, 9, 13, 18, 20, 22, 23; *Ur. lateralis* 7, 11; *Ur. barnesi* 7, 13, 18, 22; *Ur. solomonis* 7, 9, 18, 22; *Cx. quinquefasciatus* 7, 9, 18, 21, 22; *Cx. sitiens* 2, 3, 6, 7, 9, 11; *Cx. annulirostris* 1, 2, 5, 7, 9, 10, 19, 20, 22, 23; *Cx. omani* 7, 22; *Cx. squamosus* 7, 9, 20, 21, 22, 23; *Cx. halifaxii* 7, 9; *Cx. belkini* 7; *Cx. perkinsi* 7, 9; *Cx. papuensis* 7, 9; *Cx. fragilis* 7; *Cx. pullus* 7, 9, 18, 21, 22, 23; *Cx. leonardi* 7; *Cx. franclemonti* 7; *Cx. lairdi* 7, 22; *Cx. bergi* 7, 20, 23; *Cx. oweni* 7; *Cx. winkleri* 7; *Cx. laffooni* 20; *Cx. solomonis* 3, 7, 9, 20, 22, 23; *Cx. walukasi* 3, 4, 7; *Cx. becki* 7, 12; *Cx. hurlbuti* 7; *Cx. perryi* 7; *Cx.* (*Lop.*) *16* 7; *Cx.* (*Lop.*) *17* 7; *Cx.* (*Lop.*) *19* 7; *Cx.* (*Lop.*) *21* 7, 22; *Ad. catasticta* 7; *Ho. solomonis* 7, 22; *Fi. solomonis* 7; *Ma. lutea* 7, 14, 16, 22; *Ma. melanesiensis* 2, 6, 7, 10, 11, 22; *Ae. perryi* 7, 22; *Ae. longiforceps* 7, 22; *Ae. rubiginosus* 7; *Ae. albilabris* 3, 7, 11, 22; *Ae. roai* 7; *Ae. argyronotum* 7, 9, 20, 21, 23; *Ae. bougainvillensis* 7; *Ae. fuscipalpis* 7; *Ae. fuscitarsis* 7; *Ae. hollingsheadi* 7; *Ae. knighti* 22; *Ae. schlosseri* 7; *Ae. solomonis* 7; *Ae.* (*Fin.*) *23* 7, 12; *Ae. vigilax* 9; *Ae. mcdonaldi* 7; *Ae. painei* 7, 22; *Ae. imprimens* 1, 2, 3, 5, 6, 7, 10, 11, 14, 18, 22; *Ae. cuccioi* 7, 20; *Ae. carmenti* 1, 2, 3, 5, 6, 7, 11, 15, 18, 21; *Ae. lineatus* 1, 3, 5, 7, 9, 11, 14, 15, 18, 22; *Ae. mccormicki* 7, 22; *Ae. alboscutellatus* 4, 7, 18; *Ae. aegypti* 7, 22; *Ae. albolineatus* 3, 7, 22; *Ae. gur-*

neyi 7, 11, 13, 18, 22, 23; *Ae. quasiscutellaris* 3, 7, 9, 11, 18, 22; *Ar. breinli* 2, 3, 5, 7, 10, 11, 14, 18, 22; *Tp. lipovskyi* 2, 7; *Tp. solomonis* 6, 7, 11, 14, 18, 22; *Tp. coheni* 7; *Tp. mathesoni* 3, 7, 9, 11; *Tp. stonei* 5, 7, 11, 22, 23.

COLLECTIONS. 1, J. A. Kusche & W. M. Gifford, December 1920–January 1921; 2, A. G. Carment, 1923–25 at Maravovo and Rere; 3, R. W. Paine, August 1928 at Ilu, Rere, Tenaru and Mauronia; 4, ? S. M. Lambert, 1930; 5, M. Willowes (passed to S. M. Lambert), May 1933 at Kau Kau and Aola Bay; 6, R. J.A.W. Lever, 1932–36 at Lunga and Ruavatu; 7, U. S. Forces, principally P. W. Oman, March–November 1943, and J. N. Belkin, October 1943 to May 1945 (973 collections), also L. E. Rozeboom, K. L. Knight and J. Laffoon, September–November 1944, D. E. Beck, July–August 1944, A. B. Gurney, November 1943, W. B. Owen and others, all principally on northern Guadalcanal, from Maravovo to Aola Bay, and to West Cape from sea level to about 200 m (a few hundred feet, Belkin 1950) and perhaps 6 km inland; 8, R. H. Black, 1952 at Suagi and Roroni; 9, M. Laird, August–September 1953 at Henderson Field, Honiara, Ilu, Kukum, Poha R mouth and several inland locations; 10, J. S. Phillips, 1953–54 at Kukum; 11, E. S. Brown, 1954–56 at Ilu, Kukum, Poha, Ruavatu, Tenaru and Tetere; 12, M. V. Natuna, 1954 at Kukudu, Marovo and Malageti, south coast; 13, J. de Beaux, 1956 at Honiara, Kukum and Rove; 14, J. L. Gressitt, June 1956 at Kukum, Poha and Suta (Gold Ridge); 15, J. L. Gressitt, September–October 1957 at Kukum, Tenamba and Tenaru; 16, C. W. O'Brien, May 1960 at Paripao; 17, malaria entomology surveys, 1962–63 at some 175 localities; 18, R. Straatman and J. & M. Sedlacek, April–June 1964 at Honiara, Mt Austen, Roroni, Tambalia and Tenaru; 19, R. Slooff, 1964–68, at various localities; 20, M. Maffi, October 1968 and August 1970 in central Guadalcanal about 20 km inland from north coast; 21, M. Maffi, November 1968 to September 1970 in Honiara-Tenaru area; 22, B. Taylor, October 1969 to April 1973 on northern Guadalcanal from Maravovo eastwards to Talaula; and 23, B. Taylor, October to December 1972 and February 1973 in central Guadalcanal, 12 to 20 km inland from north coast.

Rennell

The most southerly of the Solomon Islands, Rennell is a moderately large island, lying between 11°25'–11°55'S and 159°57'–160°37'E. It is a raised coral formation some 85 km long and up to 15 km wide, with the highest points rising to 150 m at the outer rim of the island. A large brackish lake, L Tegano, which is nearly 30 km in total length, is at the eastern end of the island. The over 900 inhabitants are Polynesian and they live around the lake and in the west-central area. Bauxite mining operations have been under way recently in the western end. All the known mosquito collections have been detailed by Maffi (1973b) with additional notes by Taylor (1973) and Taylor & Tenorio (1974).

SPECIES. *An. farauti* 3, 4, 5, 6, 7, 9, 10; *An. koliensis* 10; *Ur. barnesi* 6, 10, 11; *Cx. annulirostris* 4, 5, 6, 7, 11; *Cx. squamosus* 4; *Cx. fragilis* 6, 11; *Cx. pullus* 6, 8, 10, 11; *Cx.* (*Lop.*) *23* 1, 4, 5, 6, 7, 8, 10, 11; *Ae. notoscriptus* 1, 2, 4, 5, 6, 8, 10, 11; *Ae. maffii* 11; *Ae. albolineatus*

4; *Ae. gurneyi* 8, 11; *Ae. hebrideus* 1, 2, 4, 5, 6, 8, 10, 11; *Ae. hoguei* 5, 6, 10, 11; *Tp. solomonis* 6, 10, 11; *Tp. coheni* 11.

COLLECTIONS: 1, S. M. Lambert, May–June 1930; 2, S. M. Lambert, June 1933; 3, R. H. Black, June 1952; 4, M. & E. Laird, August 1953; 5, E. S. Brown, November 1955; 6, J. de Beaux, October–November 1956; 7, Noona Dan Expedition, August 1962; 8, T. Wolff, March–April 1965; 9, malaria entomology survey, April 1966; 10, M. Maffi, 4 visits during 1969–1970; and 11, B. Taylor, June 1971.

Bellona

A small, 10 km long and up to 3 km wide, elevated coral island lying about 11°15'S and 159°50'E. Like Rennell, the highest points, about 76 m, are at the rim of the island. About 600 Polynesians occupy the center of the island. Maffi (1973b) has summarized all known mosquito collections except those carried out more recently by Taylor (1973).

SPECIES. *An. farauti* 4; *Ur. quadrimaculata* 6; *Cx. halifaxii* 3; *Cx.* (*Lop.*) *23* 3, 6; *Ae. notoscriptus* 1, 2, 3, 6, 7, 8; *Ae. albolineatus* 2, 3, 4, 5, 6, 7; *Ae. gurneyi* 4, 5; *Ae. hebrideus* 1, 2, 3, 4, 5, 6, 7, 8; *Ae. hoguei* 6.

COLLECTIONS. 1, S. M. Lambert, June 1930; 2, S. M. Lambert, June 1933; 3, M. & E. Laird, August 1953; 4, E. S. Brown, November 1955; 5, J. de Beaux, October 1956; 6, M. Maffi, April 1969; 7, B. Taylor, June 1971; and 8, F. B. Eyeres & H. Williams, May 1972.

Malaita

Lying more along a north-south axis than the other major islands, Malaita and its sister island Maramasike (Small Malaita) total about 195 km in length with a maximum width of 40 km. The total land area is about 4500 km^2 and there is a central longitudinal mountain range rising to 1432 m. Flat land is restricted to a narrow coastal strip but there are extensive lagoons fringing the northeast coast and parts of the west coast. Mangrove swamps are found around the shores of the lagoons and extensively in the narrow Maramasike Passage which separates the 2 main islands. The total population is over 51,000 of which some 7000 live in high inland areas of north and central Malaita. Auki is the district headquarters and the main Government station. There are small airfields near Auki and at Parasi on Maramasike.

Previously reported mosquito collections were by R. W. Paine in 1928 (Paine & Edwards 1929), C.H.G. White in 1931, S. M. Lambert in ?1931, R.J.A.W. Lever in 1934, J. R. Douglas in ?, and E. S. Brown in 1954 (all reported by Belkin 1962) and by R. Slooff in 1967 (Slooff 1972).

SPECIES. *Bi. hollandi* 14, 17; *An. farauti* 5, 6, 10, 11, 14, 15; *An. punctulatus* 9, 10, 15; *An. koliensis* 10, 11, 14, 15; *An. lungae* 9, 10, 12, 14, 17; *Ur. quadrimaculata* 6, 9, 17; *Ur. wysockii* 17; *Ur. civinskii* 11, 14, 17; *Ur. barnesi* 17; *Cx. quinquefasciatus* 14; *Cx. sitiens* 9; *Cx. annulirostris* 1, 6, 14, 17; *Cx. squamosus* 14; *Cx. halifaxii* 1, 9, 14, 17; *Cx. papuensis* 9; *Cx. fragilis* 6; *Cx. pullus* 12; *Cx. bergi* 14; *Cx. solomonis* 1, 11, 12, 14, 17; *Cx. perryi* 17; *Ma. lutea* 8; *Ae. longiforceps* 14; *Ae. albilabris* 1, 2, 3, 6, 14, 17; *Ae. hollingsheadi* 17; *Ae. knighti* 17; *Ae. solomonis* 16; *Ae.* (*Fin.*) sp. *kochi* gp. southern Malaita form 17; *Ae. lineatus* 1; *Ae. dasyorrhus*

13; *Ae. albolineatus* 2, 6, 9, 17; *Ae. gurneyi* 17; *Ae. quasiscutellaris* 1, 11, 12, 17; *Ar. breinli* 1, 4, 6, 9, 14, 17; *Tp. lipovskyi* 9, 17; *Tp. solomonis* 6, 7, 17; *Tp. coheni* 9; *Tp. mathesoni* 17; *Tp. stonei* 9.

COLLECTIONS. 1, R. W. Paine, September 1928 at Manaba and Su'u; 2, C.H.G. White, March 1931; 3, S. M. Lambert ?; 4, R.J.A.W. Lever, May 1934 at Su'u; 5, J. R. Douglas ?; 6, E. S. Brown, September 1954 at Auki, Baunani, Fauabu (Fouambu), Ohne (One) and Su'u; 7, J. L. Gressitt, September 1957 at Tangatalau; 8, J. L. Gressitt, October 1957 at Auki; 9, R. Straatman and J. & M. Sedlacek, June 1964 at Dala; 10, R. Slooff, August to October 1967 at numerous locations (*An. punctulatus* only at Fiu and Mariki and *An. lungae* only at Matanasi); 11, M. Maffi, January 1969 on northern Malaita at Takwa, Bungu and Hatodea (Manaoba I); 12, M. Maffi, March 1969 at Helanioho and Wallande, both on Maramasike I; 13, B. Taylor, January 1970 at Wallande; 14, M. Maffi, February April 1970 in Are Are at Eke, Harisi, Hauporo, Kiu, Niha R, Rohinari and Rutaorea; 15, malaria entomology surveys, 1969–70 at 320 locations; 16, J. G. Avery, July 1971 at Auki; and 17, B. Taylor, November 1972 in Are Are at Ainalato, Maka, Ote, Pisua, Tawairoi and Tawanaora.

Ndai

A small, 6 km long, isolated island, 7°55'S and 160°38'E, with a single village of about 80 people.

The only mosquito species known is *An. farauti* collected by E. S. Horoto in June 1970.

Ontong Java

The 2nd largest coral atoll in the Pacific, 75 km long and up to 25 km wide, lying between 5°–5°32'S and 159°15'–159°40'E, at the northern limits of the Solomons. The about 900 Polynesian inhabitants live on 2 of the small islands (Pelau and Liuaniua, combined land area 7.8 km^2). Previously reported mosquito collections were by R. H. Black (1952), M. V. Natuna and E. S. Brown in 1954–55 (Hollins 1957), D. Bonnet in 1956 (Belkin 1962, 1965) and M. Maffi in 1968 (Slooff 1972).

SPECIES. *An. farauti* 1, 2, 3, 7; *Cx. sitiens* 3; *Cx. annulirostris* 3, 6; *Ae. lineatus* 3, 4, 5, 8, 9; *Ae. hebrideus* 3, 4, 5, 8, 9; *Ae. varuae* 8, 9.

COLLECTIONS. 1, R. H. Black, May 1952 on Avaha; 2, M. V. Natuna, July 1954 at Liuaniua; 3, E. S. Brown, January–February 1955 on Guailoku, Liuaniua, Pelau, Avaha and Keila; 4, M. V. Natuna and E. S. Brown, August 1955; 5, D. Bonnet, September 1956 at Liuaniua; 6, M. Maffi, January 1968 at Liuaniua; 7, malaria entomology surveys, September 1969 and June 1970 on Liuaniua; 8, F. D. Gibson, July 1971 at Liuaniua and Pelau; and 9, B. Tugunua, July 1972 at Liuaniua.

Sikaiana

An isolated coral atoll, lying about 8°27'S and 162°50'E, with a maximum width of 20 km. The about 200 Polynesian inhabitants live on Sikaiana (Taini) Island with an area

of 2.6 km². Previously reported mosquito collections were by C.H.G. White (sent to Edwards by A. G. Carment) in 1925 (Edwards 1926), S. M. Lambert in 1930 (Lambert 1931), R. H. Black (1952), M. Laird in 1953 (Laird 1956), D. Bonnet in 1956 (Belkin 1962, 1965) and M. Maffi in 1968 (Slooff 1972).

SPECIES. *An. farauti* 2, 3, 4, 7, 8; *Cx. annulirostris* 4, 5, 8; *Ae. maffii* 5; *Ae. lineatus* 1, 4, 5, 6, 8; *Ae. hebrideus* 8; *Ae. varuae* 1, 4, 5, 6, 8.

COLLECTIONS. 1, C.H.G. White, March 1925; 2, S. M. Lambert, 1930 ?; 3, R. H. Black, May 1952; 4, M. Laird, September 1953; 5, D. Bonnet, September 1956; 6, M. Maffi, January 1968; 7, malaria entomology surveys, September 1969 and June 1970; and 8, F. D. Gibson, July 1971.

Ulawa

A relatively small narrow island, lying about 9°45'S and 161°55'E, some 20 km long and up to 5 km wide. The total land area is 65 km² and the highest point is 366 m. The about 1500 inhabitants live in coastal villages. The only previously reported mosquito collections have been by R.J.A.W. Lever in 1934 and E. S. Brown in 1955 (both in Belkin 1962).

SPECIES. *An. farauti* 3; *Ar. breinli* 1, 2.

COLLECTIONS. 1, R.J.A.W. Lever, May 1934; 2, E. S. Brown, 1955; and 3, malaria entomology surveys, September 1969 at 8 localities.

San Cristobal

The easternmost of the major islands, San Cristobal is over 125 km long and up to 40 km wide. The mountain ranges form north-south ridges across the island and not along the island. The highest point is 1250 m. The people of San Cristobal mostly live near the coast although there are small populations in the central Bauro and Wainoni areas. The district administrative headquarters is at Kira Kira and there is a small airfield at nearby Ngorangora. Scattered coconut plantations occur on the north coast. The only previously reported mosquito collections were by E. S. Brown in 1955 (Belkin 1962), R. Slooff in 1967 (Slooff 1972) and E. S. Horoto in 1970 (Taylor 1972).

SPECIES. *Bi. hollandi* 10; *An. farauti* 1, 5, 6, 8, 9, 11; *An. punctulatus* 9, 11; *An. koliensis* 5, 6, 9, 11; *An. lungae* 11; *An. nataliae* 9; *An. solomonis* 9; *Ur. quadrimaculata* 4, 6, 7, 8, 11; *Ur. wysockii* 4; *Ur. civinskii* 11, 12; *Ur. barnesi* 11; *Cx. quinquefasciatus* 11; *Cx. sitiens* 10; *Cx. annulirostris* 8, 11; *Cx. squamosus* 11; *Cx. halifaxii* 11, 12; *Cx. fragilis* 11; *Cx. pullus* 4, 11, 12; *Cx. leonardi* ? 4; *Cx. franclemonti* 11; *Cx. lairdi* 11; *Cx. bergi* 6; *Cx. oweni* 12; *Cx. winkleri* 12; *Cx. solomonis* 6, 11, 12; *Cx. walukasi* 11; *Cx. perryi* 11; *Cx. (Lop.) 19* 11; *Ae. longiforceps* 4, 11; *Ae. albilabris* 2, 4, 7, 10, 11; *Ae. argyronotum* 2, 6, 8, 11, 12; *Ae. hollingsheadi* 11; *Ae. knighti* 11; *Ae. solomonis* 4; *Ae. horotoi* 10; *Ae. imprimens* 10, 11; *Ae. carmenti* 1, 11; *Ae. lineatus* 1, 11; *Ae. dasyorrhus* 7; *Ae. albolineatus* 4, 7, 11; *Ae. gurneyi* 7, 10, 11; *Ae. quasiscutellaris* 7, 8, 11; *Tp. distigma* 4; *Tp. solomonis* 4; *Tp. coheni* 3, 4, 7; *Tp. mathesoni* 11; *Tp. stonei* 4, 7, 8, 10, 11.

COLLECTIONS. 1, E. S. Brown, September 1955 at Bulimaterava and Star Harbour; 2, C. W. O'Brien, August 1960 at Kira Kira; 3, J. Sedlacek, May 1964 at Wairaha R;

4, R. Straatman, November 1964 at Kira Kira; 5, R. Slooff, September and November 1967 at Baunasughu, Bauro, Manighari, Pamua, Tawani and Waimapura; 6, M. Maffi, October 1970 inland in Magoha R valley; 7, M. Maffi, October 1970 at Namugha, Star Harbour; 8, M. Maffi, October 1970 in Kira Kira area; 9, E. S. Horoto & J. S. Taerau, 1970–71, malaria entomology surveys at 250 localities; 10, E. S. Horoto, March 1971 at Maitoo Plantation, Manitawaniuhi, Nukukaeisi and Waimasi; 11, B. Taylor, March, July and August 1971, and April, June, July and September 1972 in coastal area between Manibwena and Arohane, including Kira Kira and inland at Maniparegho; and 12, E. S. Horoto, August 1972 in inland Bauro bush area.

Ugi (Uki Ni Masi)

A small island 10 km in length and 5 km in width with a highest point of 204 m. There are fairly extensive coconut plantations. The only previously reported mosquito collections were by R. W. Paine in 1928 (Paine & Edwards 1929) and by S. M. Lambert in 1930 (Belkin 1962).

SPECIES. *An. farauti* 3, 4; *An. koliensis* 3, 4; *An. lungae* 3; *Ur. quadrimaculata* 3; *Cx. sitiens* 5; *Cx. annulirostris* 3; *Cx. pullus* 3; *Cx. solomonis* 3; *Cx. walukasi* 5; *Ae. albilabris* 2, 3, 5; *Ae. carmenti* 1; *Ae. lineatus* 3; *Ae. albolineatus* 2, 5; *Ae. quasiscutellaris* 3; *Tp.* (*Trp.*) sp. in *bimaculipes* gp. 5; *Tp. stonei* 3.

COLLECTIONS. 1, R. W. Paine, September 1928; 2, S. M. Lambert, August 1930; 3, M. Maffi, October 1970 at several localities around the island; 4, E. S. Horoto, July 1971, malaria entomology survey at 23 localities; and 5, E. S. Horoto, July 1971 at Ahia and Pwaunania.

Three Sisters Group

A chain of 3 small coral islands with extensive coconut plantations on Malaulo and Malaupaina. Previously reported mosquito collections were by R.W. Paine in September 1928 (Paine & Edwards 1929), R.J.A.W. Lever in 1934 (Lever 1937, Belkin 1962) and E. S. Brown in 1955 (Belkin 1962).

SPECIES. *An. farauti* 2, 3; *Ur. quadrimaculata* 1; *Ae. horotoi* 2.

COLLECTIONS. 1, R. W. Paine, September 1928; 2, R.J.A.W. Lever, May 1934; and 3, E. S. Brown, 1955.

Santa Ana

A small raised coral island about 4 km across. There is a freshwater lake in the center of the island and the highest point is 158 m. The small number of inhabitants live in coastal villages. The only previously recorded mosquito collection was by R.J.A.W. Lever in 1932 (Belkin 1962).

SPECIES. *An. farauti* 2; *Ur. quadrimaculata* 2, 3; *Ur. civinskii* 3; *Cx. sitiens* 2; *Cx. lairdi* 3; *Cx. solomonis* 2; *Ae. albilabris* 2; *Ae. albolineatus* 1.

COLLECTIONS. 1, 1, R.J.A.W. Lever, October 1932; 2, M. Maffi, October 1970 at several locations; and 3, R. Piringisau, April 1971 at Lake Wairapa.

Santa Catalina

A small raised coral island. The highest point is about 98 m and the greatest distance across the island is about 3 km. There are few inhabitants. No mosquito collections have been recorded previously.

SPECIES. *An. farauti* 2; *Ur. quadrimaculata* 1; *Ae. albilabris* 1; *Ae. albolineatus* 1; *Tp. distigma* ? 1; *Tp. solomonis* 1.

COLLECTIONS. 1, M. Maffi, October 1970 at several localities; and 2, R. Piringisau, April 1971, malaria entomology survey.

BIONOMICS SUMMARY

ADULT BEHAVIOR

Species whose adult females are known to feed on man

The number of species which are common and relatively widespread man-biting pests is small. The 3 member species of the *An. punctulatus* complex are perhaps the most important, as they are all vectors of malaria and filariasis. Of these 3 species *An. farauti* is the most abundant, being taken more often and in greater numbers in night man-biting catches than any other mosquito species in the Solomons. The other 2 species are *An. koliensis* and *An. punctulatus*, the latter, which has a restricted distribution, being most abundant on northern Guadalcanal. *Cx. quinquefasciatus* is the most common species in the towns, where it can be a major pest at night, particularly in damp weather. The only other night biting species of major importance is *Cx. annulirostris*, which is most abundant in riverine and coastal areas. In their respective localities both *Cx. quinquefasciatus* and *Cx. annulirostris* may be transmitters of filariasis, although they are probably of much less significance than the anopheline species. A species which can be a severe pest in the late afternoon and early evening, especially following the onset of the wetter season on northern Guadalcanal, is *Ae. imprimens*. In shaded swampy areas *Ae. carmenti* and *Ae. lineatus* can be very unpleasant daytime pests as can *Ar. breinli* in poorly managed coconut plantations. On the outlying islands *Ae. hebrideus* is a major day-biting pest.

A number of species can be relatively severe pests in the close vicinity of their breeding sites. These include, in mangrove swamp areas, *Ae. longiforceps* and *Ae. dasyorrhus*; in coastal areas, particularly where there are brackish pools, *Cx. sitiens* and *Ae. vigilax*; in freshwater swamp areas, *Ho. solomonis*, *Ma. melanesiensis* and *Ae. alboscutellatus*; in inland riverine areas, *An. solomonis* (which may be a malaria vector); in domestic situations, usually breeding in septic tanks, *Tp. solomonis*; and in forested areas of Rennell and Bellona, *Ae. notoscriptus*.

A number of other species have been occasionally collected biting or attempting to bite man. These include *An. lungae*, *Cx. halifaxii*, *Ae. perryi*, *Ae. albilabris*, *Ae. horotoi*, *Ae. aegypti*, *Ae. gurneyi*, *Ae. hoguei*, *Tp. binotatus* and *Tp. stonei*.

Virtually nothing is known of other sources of blood meal for Solomons mosquitoes. *Ae. longiforceps* has been recorded feeding on mud-skipper fish (Slooff & Marks 1965) and *An. lungae* appears to feed on birds.

Adult resting places

Extremely little is known about the normal resting places of mosquito adults in the Solomons. In human habitations *An. farauti*, *An. punctulatus*, *An. koliensis*, *Cx. quinquefasciatus* and *Cx. annulirostris* have been relatively frequently collected. Others which have been found resting in houses include *Cx. pullus*, *Ae. solomonis*, *Ae. carmenti*, *Ae. gurneyi* and *Tp. stonei*. Crabholes provide a readily located and common coastal resting place for *Ur. lateralis*, *Ae. becki*, *Ae. perryi*, *Ae. longiforceps* and *Ae. carmenti*. Most other species which have been collected as adults in the field have been found in the close proximity of their breeding sites. A few species appear to be readily attracted to house lights and these include *Ur. barnesi*, *Ur. solomonis* and *Ma. lutea*.

Juvenile habitats

Between June 1952 and June 1954 Laird made a special study of mosquito juvenile habitats in the South Pacific, including the Solomons (Laird 1956). He was primarily concerned with the ecology and interrelation of different water bodies and classified larval habitats into 12 categories. However, in the Solomons he collected only 25 species of mosquitoes and his study is of limited usefulness in terms of a general review of Solomons' mosquitoes.

Belkin divided breeding sites into 2 principal categories, ground water habitats and plant-container habitats. His discussion of these categories is brief and generalized [1962 (1): 46–50] but his conspectus tables, which include the Culicidae of the whole South Pacific, give 16 subcategories of ground waters and 10 subcategories of containers [1962 (2): 1–5].

We consider that there is some over-differentiation in Belkin's subcategories, particularly of ground waters, but conversely some aspects, such as shade cover and organic content, are inadequately covered. In this summary we have tried to segregate the different juvenile habitats so as to enable the mosquito fauna of a particular habitat in the Solomons to be anticipated with reasonable confidence. In addition to the main divisions and subdivisions, we have annotated particular species where further qualification seems desirable.

1. Flowing water (streams, springs)
   a. In full shade: *Bi. hollandi*, *An. lungae*, *An. nataliae*, *Ur. barnesi*, *Cx. squamosus* (among filamentous algae), *Cx. solomonis*, *Ae. imprimens*.
   b. In partial shade: *An. farauti*, *Ur. civinskii*, *Cx. lairdi*.
   c. Without shade: *Ur. solomonis*.
2. Ground pools and swamps

2.1. Fresh water, permanent.
   a. In full shade: *Bi. hollandi*, *An. lungae*, *An. solomonis*, *Ur. barnesi*, *Ur. sexaueri*, *Cx. omani*, *Cx. leonardi*, *Cx. lairdi*, *Cx. franclemonti*, *Ho. solomonis*, *Fi. solomonis*, *Ma. lutea* (attached to submerged plant stems), *Ae. mcdonaldi*.

b. In partial shade: *An. farauti*, *An. koliensis*, *Ur. civinskii*, *Cx. lairdi*, *Cx. solomonis*, *Cx.* (*Lop.*) *17*, *Cx.* (*Lop.*) *21*, *Cx.* (*Lop.*) *23*, *Ma. melanesiensis* (attached to submerged plant stems); *Ae.* (subgenus ?) sp. Bougainville form.

c. Without shade: *An. punctulatus*, *Ur. solomonis*, *Cx. annulirostris*, *Ad. catasticta* (in algal masses).

2.2. Fresh water, temporary (usually consequent to ground clearance and thus with no, or only partial, shade): *An. farauti*, *An. punctulatus*, *An. koliensis*, *Ur. civinskii* (less common), *Ur. solomonis*, *Cx. annulirostris*, *Cx. lairdi* (occasionally), *Cx. solomonis*, *Cx.* (*Lop.*) *23*, *Ae. painei*, *Ae. imprimens* (in shade), *Ae. carmenti* (in shade), *Ae. lineatus*, *Ae. mccormicki*, *Ae. alboscutellatus* (in shade).

2.3. Fresh water, with a high organic content: *Ur. quadrimaculata*, *Ur. barnesi* (taro swamp gardens), *Cx. quinquefasciatus*, *Cx. halifaxii*, *Cx. papuensis*, *Cx. pullus*, *Ae. lineatus* (taro swamp gardens), *Ae. quasiscutellaris* (rare).

2.4. Brackish water: *An. farauti*, *Ur. lateralis*, *Cx. sitiens*, *Cx. becki* (rare), *Ae. vigilax*.

3. Rock pools

3.1. Fresh water (often with fallen leaves and other organic matter): *An. solomonis*, *Ur. civinskii* (rare), *Ur. barnesi* (infrequent), *Cx. bergi* (inland), *Cx. oweni* (inland), *Cx. winkleri* (inland), *Cx. laffooni*, *Cx. solomonis*, *Cx.* (*Lop.*) *18*, *Ae. notoscriptus* (rockholes), *Ae. argyronotum* (mostly inland), *Ae. vigilax* (uncommon), *Ae. cuccioi*, *Ae. alboscutellatus*, *Ae. gurneyi* (rockholes, rare), *Ae. hoguei*.

3.2. Brackish water: *An. farauti*, *Cx. whittingtoni* (probably), *Cx. sitiens*, *Ae. vigilax*, *Ae. dasyorrhus* (rare), *Ae. hebrideus*.

4. Crabholes (coastal, usually with brackish water): *Cx. becki*, *Ae. becki* (probably), *Ae. perryi* (probably), *Ae. longiforceps*.

5. Artificial containers

5.1. Small (tin cans, plates, buckets, etc.): *An. farauti* (rare), *Ur. quadrimaculata*, *Ur. solomonis* (rare), *Cx. pullus*, *Ae. albilabris*, *Ae. aegypti*, *Ae. albolineatus*, *Ae. gurneyi* (rare), *Ae. hebrideus*, *Ae. quasiscutellaris*, *Ae. varuae* (rare), *Tp. binotatus*, *Tp. stonei*.

5.2. Large (oil drums, water tanks, canoes, etc.): *Ur. quadrimaculata*, *Cx. quinquefasciatus* (including foul water, septic tanks), *Cx. sitiens*, *Cx. annulirostris* (infrequent), *Cx. halifaxii* (fairly high organic content), *Cx. papuensis*, *Cx.* (*Lop.*) *23*, *Ae. notoscriptus* (rare), *Ae. hebrideus*, *Ae. quasiscutellaris*, *Ae. varuae*, *Tp. solomonis* (including foul water, septic tanks).

6. Natural containers

6.1. Coconut shells and husks:

a. Fresh water: *An. farauti* (rare), *Ur. quadrimaculata*, *Cx. sitiens* (uncommon), *Cx. fragilis*, *Cx.* (*Lop.*) *19*, *Ae. notoscriptus*, *Ae. albilabris*, *Ae. dasyorrhus* (rare), *Ae. albolineatus*, *Ae. gurneyi*, *Ae. hebrideus*, *Ae. hoguei*, *Ae. quasiscutellaris*, *Ae. varuae*, *Tp. distigma*, *Tp. lipovskyi*, *Tp. coheni* (rare).

b. Foul water, with decaying coconut meat: *Ur. quadrimaculata*, *Cx. pullus*, *Cx. walukasi*, *Ae. albolineatus*, *Ae. hebrideus*, *Ae. varuae*, *Ar. breinli* (including fermenting contents), *Tp. solomonis*, *Tp. stonei*.

6.2. Other fallen plant parts, on ground:
   a. Coconut spathes: *Ur. quadrimaculata, Cx. pullus* (high organic content), *Ae. hebrideus, Ae. quasiscutellaris, Tp. stonei.*
   b. Large leaves: *Ur. quadrimaculata.*

6.3. Open pools on horizontal tree trunks (living and fallen) and on cleft tree roots and buttresses: *Cx. walukasi, Ae. albilabris, Ae. argyronotum* (coastal), *Ae. dasyorrhus* (brackish), *Ae. albolineatus, Ae. gurneyi, Ae. hebrideus, Ae. quasiscutellaris.*

6.4. Enclosed treeholes: *Cx. papuensis* (large holes), *Cx. walukasi, Cx.* (*Lop.*) *19, Cx.* (*Lop.*) *23* (less common), *Ae. rubiginosus* (possibly), *Ae. notoscriptus, Ae. albilabris, Ae. roai, Ae. argyronotum* (coastal), *Ae. dasyorrhus* (brackish), *Ae. albolineatus, Ae. gurneyi, Ae. quasiscutellaris, Tp. distigma, Tp. lipovskyi, Tp. binotatus, Tp.* (*Trp.*) *sp.* in *bimaculipes* gp., *Tp. solomonis* (infrequent), *Tp. coheni, Tp. stonei, Tp. torokinae.*

6.5. Palm stumps, with high decaying organic content:
   a. Sago palm: *Cx. halifaxii, Cx. pullus, Cx. walukasi, Cx.* (*Lop.*) *19, Ae. albilabris, Ae. albolineatus, Tp. distigma* (possibly), *Tp. lipovskyi, Tp. solomonis.*
   b. Banana palm: *Ae. albilabris, Ae. quasiscutellaris.*

6.6. Bamboo stubble: *Ae. albilabris, Ae. albolineatus, Tp. lipovskyi, Tp. stonei.*

6.7. Leaf axils:
   a. Pandanaceae: *Ur. wysockii, Cx. belkini, Cx. perkinsi, Cx. hurlbuti, Cx. perryi, Cx.* (*Lop.*) *22, Ae. albilabris* (relatively uncommon), *Ae. bougainvillensis, Ae. francleмonti, Ae. fuscipalpis, Ae. fuscitarsis, Ae. hollingsheadi, Ae. horotoi* (probably), *Ae. knighti, Ae. maffii, Ae. neogeorgianus, Ae. schlosseri, Ae. solomonis, Ae.* (*Fin.*) *sp. 23, Ae.* (*Fin.*) South Malaita form, *Ae. albolineatus, Tp. lipovskyi.*
   b. Aroids: *Ur. quadrimaculata, Cx.* (*Lop.*) *16, Ae. neogeorgianus, Ae. schlosseri* (rare), *Tp. binotatus, Tp. mathesoni.*
   c. Other plants: *Tp. lipovskyi* (sago palm), *Tp. floridensis* (wild banana).

Predaceous larvae

A few species have larvae which are active predators on relatively large live animal material, including larvae of other mosquito species. The larva of *Cx. halifaxii* has prominent, well developed mouthbrushes and is not uncommon in water rich in organic material such as in small ground pools, sago palm stumps and artificial containers like canoes. The larva of *Ae. painei*, which is unusually large for a mosquito species, is infrequently found in temporary pools in forested areas and in coconut plantations. The 3 species of *Tripteroides* (*Rachisoura*) in the Solomons all have larvae with characteristic well developed spines on the maxillae. *Tp. mathesoni* is found only in the leaf axils of aroid species. *Tp. stonei* is not uncommonly found in coconut shells and husks, bamboo stubble and less frequently in treeholes. *Tp. torokinae* is a Bougainville species, also known from the Treasury Islands, which is found in treeholes.

Larval infections

The only detailed study of commensals and parasites of mosquito larvae in the Solomons was made by Laird (1956) and it seems probable that the only parasites of possible value in mosquito control are members of the fungus genus *Coelomomyces* Keilin, 1921. The first records were by Laird (1956) who collected *An. punctulatus* larvae infected with *Coelo. solomonis* on Guadalcanal and *Ae. hebrideus* larvae infected with *Coelo. stegomyiae* on Rennell.

In the course of our collections we have come across several other cases of *Coelomomyces* infections. Maffi & Genga (1970) reported infections of *An. farauti* larvae collected on Guadalcanal and Choiseul, of *Ur. barnesi* larvae collected on Santa Isabel and of *Cx.* (*Lop.*) *23* larvae collected on Rennell. These authors also reported an infection in *Cx. annulirostris* collected, however, not in the Solomons but on Vanikoro, Santa Cruz Islands.

This paper contains further records of infections in *An. farauti* larvae collected on Guadalcanal and Gizo and new records of infections in *An. koliensis* and *Ae. albilabris* larvae collected on San Cristobal.

Although larvae of all 3 members of the *An. punctulatus* complex have now been found with *Coelomomyces* infections, the reports are very few in relation to the vast numbers of larvae of the complex which have been collected and identified in the course of malaria entomology studies. Thus, the prospect of successfully using *Coelomomyces* as a means of biological control of the malaria vector species in the Solomons can only be regarded as extremely poor.

Acknowledgments: We would like to thank all our former colleagues in the B.S.I.P., particularly the staff of the entomology section of the national Malaria Eradication Programme. Outstanding among these colleagues was Mr E. Sosimo Horoto. Dr Wallace Steffan and his associates at the Bishop Museum and Prof. J. N. Belkin have given us invaluable assistance, encouragement and advice. We are also grateful to Prof. D. J. Lee and Dr P. F. Mattingly for allowing us to examine the collections in their care, in Sydney and London, respectively. Others who have helped us are Dr E. N. Marks, Mr R. J. A. W. Lever and Dr T. Wolff.

LITERATURE CITED

Belkin, J. N. 1950. Mosquitoes of the genus *Tripteroides* in the Solomon Islands. *Proc. U.S. Natl. Mus.* **100:** 201–74.

1953. Mosquitoes of the genus *Uranotaenia* in the Solomon Islands. *Pac. Sci.* **7:** 312–91.

1962. *The mosquitoes of the South Pacific* (*Diptera, Culicidae*). University of California Press. Berkeley and Los Angeles. 2 vols.

1965. Mosquito studies (Diptera, Culicidae). IV. The mosquitoes of the Robinson-Peabody Museum of Salem Expedition to the South-West Pacific, 1956. *Contrib. Am. Entomol. Inst.* **1:** 11–34.

Belkin, J. N., K. L. Knight & L. E. Rozeboom. 1945. Anopheline mosquitoes of the Solomon Islands and New Hebrides. *J. Parasitol.* **31:** 241–65.

Black, R. H. 1952. *A survey of malaria in the British Solomon Islands Protectorate.* Tech. Pap. No. **33:** 1–31. S. Pacific Commission, Noumea.

Bryan, J. H. 1973. Studies on the *Anopheles punctulatus* complex. I. Identification by proboscis morphological criteria and by cross-mating experiments. *Trans. R. Soc. Trop. Med. Hyg.* **67:** 64–69.

Buxton, P. A. & G. H. E. Hopkins. 1927. Researches in Polynesia and Melanesia. I–IV. *Mem. London Sch. Hyg. Trop. Med.* **1:** 1–260.

Edwards, F. W. 1924. A synopsis of the adult mosquitos of the Australasian Region. *Bull. Entomol. Res.* **14:** 351–401.

1925. Mosquito notes—V. *Bull. Entomol. Res.* **15:** 257–70.

1926. Mosquito notes—VI. *Bull. Entomol. Res.* **17:** 101–31.

Hollins, F. R. 1957. The atoll of Ontong Java, its depopulation and malaria control. *J. Trop. Med. Hyg.* **60:** 231–37.

Huang, Y. M. 1968. *Aedes* (*Verrallina*) of the Papuan Subregion (Diptera: Culicidae). *Pac. Insects. Monogr.* **17:** 1–73.

Laird, M. 1955. Mosquitos and malaria in the hill country of the New Hebrides and Solomon Islands. *Bull. Entomol. Res.* **46:** 275–89.

1956. Studies of mosquitoes and freshwater ecology in the South Pacific. *Bull. R. Soc. N. Z.* **6:** 1–213.

Lambert, S. M. 1931. Health survey of Rennell and Bellona Islands. *Oceania* **2:** 136–73.

Lever, R. J. A. W. 1937. Economic insects and biological control in the British Solomon Islands. *Bull. Entomol. Res.* **28:** 325–31.

Maffi, M. 1973a. Morphological investigations on a population of the *punctulatus* complex of *Anopheles* (Diptera, Culicidae) from Rennell Island (Solomon Group). *Nat. Hist. Rennell I., Br. Solomon Is.* **7:** 29–39.

1973b. The mosquitoes (Diptera, Culicidae) of Rennell and Bellona. *Nat. Hist. Rennell I., Br. Solomon Is.* **7:** 41–60.

Maffi, M. & R. Genga. 1970. Contributo alla conoscenza dell' infestazione da *Coelomomyces* nei Culicidi delle Salomone Britanniche, Oceania. *Parassitologia* **12:** 171–80.

Maffi, M. & B. Taylor. 1974. The mosquitoes of the Santa Cruz faunal subarea of the Southwest Pacific (Diptera: Culicidae). *J. Med. Entomol.* **11:** 197–210.

Mattingly, P. F. 1971. Contributions to the mosquito fauna of Southeast Asia. XII. Illustrated keys to the genera of mosquitoes (Diptera, Culicidae). *Contrib. Am. Entomol. Inst.* **7:** 1–84.

Marks, E. N. 1947. Studies of Queensland mosquitoes. Part I. The *Aedes* (*Finlaya*) *kochi* group with descriptions of new species from Queensland, Bougainville and Fiji. *Queensland Univ. Pap. Dep. Biol.* **2**(5): 1–66.

Paine, R. W. & F. W. Edwards. 1929. Mosquitos from the Solomon Islands. *Bull. Entomol. Res.* **20:** 303–16.

Perry, W. J. 1949. The mosquitoes and mosquito-borne diseases of the Treasury Is. (British Solomon Is.). *Am. J. Trop. Med.* **29:** 747–58.

1950. Principal larval and adult habitats of *Anopheles farauti* Lav. in the British Solomon Islands. *Mosq. News* **10:** 117–26.

Peyton, E. L. 1972. A subgeneric classification of the genus *Uranotaenia* Lynch Arribalzaga, with a historical review and notes on other categories. *Mosq. Syst.* **4:** 16–40.

Reinert, J. F. 1973. Contributions to the mosquito fauna of Southeast Asia. XVI. Genus *Aedes* Meigen, Subgenus *Aedimorphus* Theobald in Southeast Asia. *Contrib. Am. Entomol. Inst.* **9:** (5): 1–218.

1975. Mosquito generic and subgeneric abbreviations (Diptera: Culicidae). *Mosq. Syst.* **7:** 105–10.

Sirivanakarn, S. 1968. The *Culex* subgenus *Lophoceraomyia* in New Guinea and the Bismarck Archipelago (Diptera: Culicidae). *Pac. Insects Monogr.* **17:** 75–186.

1971. Contributions to the mosquito fauna of Southeast Asia. XI. A proposed reclassification of *Neoculex* Dyar based principally on the male terminalia. *Contrib. Am. Entomol. Inst.* **7**(3): 62–85.

1973. Descriptions of two new species of *Culex* (*Lophoceraomyia*) with notes on three other species from the Papuan Subregion (Diptera: Culicidae). *J. Med. Entomol.* **10:** 212–16.

Slooff, R. 1972. Mosquitoes collected in the British Solomon Islands Protectorate between March 1964 and October 1968 (Diptera: Culicidae). *Entomol. Ber. Amsterdam.* **32:** 171–81.

Slooff, R. & E. N. Marks. 1965. Mosquitoes (Culicidae) biting a fish (Periophthalmidae). *J. Med. Entomol.* **2:** 16.

Stone, A. 1967. A synoptic catalog of the mosquitoes of the world, Supplement III (Diptera: Culicidae). *Proc. Entomol. Soc. Washington.* **69:** 197–224.

1970. A synoptic catalog of the mosquitoes of the world, Supplement IV (Diptera: Culicidae). *Proc. Entomol. Soc. Washington* **72:** 137–71.

Stone, A., K. L. Knight & H. Starcke. 1959. A synoptic catalog of the mosquitoes of the world (Diptera: Culicidae). *Entomol. Soc. Am.* (*Thomas Say Foundation*) **6.** 358 p.

Taylor, B. 1972. A new species of *Aedes* from San Cristobal, British Solomon Islands Protectorate. *J. Med. Entomol.* **9:** 317–18.

1973. The mosquitoes (Diptera, Culicidae) of Rennell and Bellona, a further contribution. *Nat. Hist. Rennell I., Br. Solomon Is.* **7:** 61–71.

1975. Observations on malaria vectors of the *Anopheles punctulatus* complex in the British Solomon Islands Protectorate. *J. Med. Entomol.* **11:** 667–87.

Taylor B. & M. Maffi. 1971. Contribution to the knowledge of *Aedes* (*Stegomyia*) *hoguei* Belkin 1962 (Diptera: Culicidae). *Pac. Insects* **13:** 119–21.

Taylor, B. & J. A. Tenorio. 1974. *Aedes* (*Finlaya*) *maffii*, a new species of mosquito from the British Solomon Islands (Diptera: Culicidae). *J. Med. Entomol.* **11:** 577–81.

Tyson, W. H. 1970. Contributions to the mosquito fauna of Southeast Asia. VII. Genus *Aedeomyia* Theobald in Southeast Asia. *Contrib. Am. Entomol. Inst.* **6**(2): 1–27.