

## **An Annotated Provisional List of Non-Saltatorial Orthopteroid Insects of Micronesia, Compiled Mainly from the Literature**

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**Abstract**—The general literature relating to the non-saltatorial orthopteroid insects of Micronesia and certain nearby groups of smaller islands of Oceania is reviewed. The species known to occur in this region are listed according to order and family. Most of the information is based on literature records which have been updated, corrected and commented upon where appropriate. A few new records are included. The orders considered are Dictyoptera (including Blattodea, Mantodea and Termitodea [Isoptera]), Zoraptera (none recorded), Embioptera, Dermaptera and Cheleutoptera (Phasmatodea).

### **Introduction**

Non-saltatorial orthopteroid insects include several groups that do not have jumping hind legs, in contrast to the saltatorial orthopteroids. The Dictyoptera (Blattodea, Blaberoidea, Ectobioidea) are commonly known as cockroaches; the Mantoidea, are mantids; Termitodea or Isoptera are termites; Embioptera are web-spinners; Dermaptera are earwigs; Cheleutoptera or Phasmatoptera are stick insects and leaf insects.

In the course of studying the saltatorial orthopteroid insects of Micronesia, numerous references to members of non-saltatorial groups were encountered. Some of these were in works that dealt specifically with orthopteroid insects, but others were in more general contexts. As no previous compilation of a similar nature has hitherto been undertaken, a provisional list of the species involved would seem useful as a preliminary to further studies of these groups in Micronesia.

Kevan (1987) has already provided a preliminary account of the saltatorial groups of orthopteroids (grigs) of Micronesia. These are the groups that have the hind legs adapted for jumping. In this account he outlined the scope and characteristics of the region, giving appropriate references. Also provided was a fairly comprehensive indication of the literature relating to all groups of orthopteroid insects

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<sup>1</sup>Dr. Kevan died in 1991. This paper has been completed, slightly revised and edited for publication by Vernon R. Vickery, Emeritus Curator.

found in the smaller oceanic islands of the South Pacific, but with particular reference to Micronesia. As Kevan (1987) cited most (though not all) of the primary literature relevant to the non-saltatorial orthopteroids in Micronesia, the reader is directed to that source by way of introduction to the present contribution; there would seem to be no reason to repeat the information already provided. Pertinent articles relating to the non-saltatorial orders that were not included by Kevan (1987) will be found under the appropriate groups of insects which follow. Some of these articles are older and/or more obscure papers, some of which were also omitted from the bibliographies of Bryan (1948) and Esaki et al. (1955). More recent papers include an account of the introduced saltatorial orthopteroid fauna of the islands (Kevan 1991), which briefly mentions some non-saltatorial species.

Kevan (1987) referred to various publications dealing with the insect fauna of the small islands of the South Pacific, that are not concerned, on the one hand with Micronesia as such, and/or on the other with orthopteroid insects, it will save the reader unnecessary literature searching if some similarly irrelevant papers are briefly noted here, together with more pertinent omissions.

Although Kevan (1987) referred to various publications dealing with the insect fauna of the small islands of the South Pacific, some are not concerned with Micronesian records, or with orthopteroids. The following paragraphs correct some omissions and errors in Kevan's paper, and save the reader unnecessary literature searching by indicating some papers that prove to be irrelevant to the study of Micronesian orthopteroids.

Kevan (1987) did not mention the early contribution to Pacific island entomology in Eschscholtz (1822). Though only two orthopteroid insects from the Pacific are mentioned, one of these, a cockroach, has relevance in the present context, as will be noted under the species involved. Although Kevan (1987) drew attention to the early contributions of Guérin[-Méneville] (1831), Le Guillou (1841) and Montrouzier (1855) to South Pacific orthopterology, these authors did not include Micronesian islands in their works. Indeed, the first referred only to a couple of orthopteroids and the third only to a few forms from Woodlark Island off New Guinea. Stål (1860) is cited as having described an acridid grasshopper from Guam, but Kevan did not note that the Swedish frigate "Eugenie," concerning whose voyage Stål wrote, also visited Ascension Island (now known as Pohnpei) in the Senyavin Islands (eastern Caroline Islands). Persson (1971) gave the date as 22.XI.1852, not long before the visit to Guam, 27-28 XI.1852. No non-saltatorial orthopteroid was collected on either island. Another omission by Kevan (1987) was mention of the catalogues of Schmeltz & Pöhl (1869-1879) and Pöhl (1884), which dealt quite extensively with insects from the South Pacific, including some from Micronesian localities. The relevant references to non-saltatorial forms will be found under the appropriate taxa below. It may be noted in this connection that the species listed by these authors (some dubiously and some under *nomina nuda*) were collected for J. C. Godeffroy und Sohn, the Hamburg shipowners; those specimens from Micronesia were mostly, if not all, taken by J. S. Kubary, who was employed as a collector by the senior Godeffroy (see Weidner, 1967). For Funafuti

Atoll in the Ellice (now Tuvalu) Islands, Hedley (1896) referred to unidentified cockroaches and a wrongly identified termite, and Rainbow (1897) and Hedley et al. (1899) listed several species of orthopteroids (including two Grylloptera), all of them incorrectly named!

For the 20th Century, Simmonds' (1925) account of the insect pests of coconut palms in the "southern Pacific" might be expected to be relevant in the present context, but, among orthopteroids, it mentioned only one species of Tettigonioida and one species of stick-insect, neither from Micronesia. A biogeographical paper by Chopard (1931), which considered South Pacific orthopteroids, was not mentioned by Kevan (1987) as it was virtually restricted to southeastern Polynesia with references to Fiji and Sámoa; it does not mention Micronesia, even in passing. Seurat's (1934) general biogeographical review is mentioned by Kevan (1987) and has some relevance here, as will be indicated in the appropriate places. There were other more entomologically oriented papers in the same symposium as that to which Seurat contributed, but which were not referred to by Kevan (1987). These include Holdhaus (1934), who briefly mentioned Micronesian island groups, but not in relation to orthopteroids (the paper dealt mainly with Coleoptera); Cheesman (1934), who dealt only with southeastern Polynesian insects; and Bryan (1934), writing on Polynesian biogeography, who mentioned some of the non-Micronesian island groups considered in the present work, such as the Ellice (or Tuvalu), Phoenix and Line Islands. Although the last author made passing references to orthopteroids, none is relevant here. Perhaps, too, one should mention a paper on Micronesian Evaniidae (Hymenoptera) by Yasumatsu (1940b), since these are parasitoids of cockroaches, but no reference is made to the hosts.

It is also appropriate to mention some general biogeographical or faunistic papers, not referred to by Kevan (1987), that deal with lesser South Pacific islands generally or which refer specifically to particular (including Micronesian) island groups, but which make no reference to orthopteroid insects, though such might be anticipated from the titles. They include the following: Krauss (1947), Gressitt (1952, 1953b,c, 1956a), Gressitt and Quate (1958), Gressitt *et al.* (1961) and Given (1968). The last merely lists insects (including orthopteroids) found on the island of Niue, and makes no mention that any of the species occur elsewhere.

Papers that deal particularly with orthopteroid insects (including termites) of the lesser South Pacific islands, but which (though they may use expressions such as "widely distributed through Oceania") do not refer, even in passing, to Micronesia or to the other island groups mentioned herein (Tuvalu, Howland, Phoenix and Line Islands) include the following: Cheesman (1927, 1928), Chopard (1930, 1931), Caudell (1932), Light (1932b,c), Hebard (1933a, b—but see under *Diploptera punctata* [Blattodea]—1935), Light (1935b), Kevan (1965), Kaltenbach (1976) and Steinmann (1979b). It may be noted that Kaltenbach (1976), who dealt mostly, but not exclusively, with New Caledonia, showed the distribution of various species on world maps, but indicated none from Micronesia, though one of the Acrididae included by him is found there. (In spite of its title, this paper deals only

with saltatorial forms and mantids, none of the latter being involved herein.) Steinmann (1979b) listed a number of Micronesian Dermaptera, but gave their distribution no more precisely than "Oceanic". It should perhaps also be noted that the paper referred to by Kevan (1987) as "Kevan (*in press*)" and which did, indeed, include a number of allusions to Micronesian cockroaches and earwigs, will not be published (at least not in the foreseeable future) as the editor of the proposed publication abandoned the project without informing the author!

### Arrangement

In the following lists of species for each order, the general arrangement is taxonomic down to subfamily—the classification more or less as in Vickery & Kevan (1983)—and alphabetical within the subfamilies for genera and species. It is not considered necessary to cite bibliographic references to specific names, author and date being deemed sufficient, except in a few instances where nomenclature is discussed. Synonyms are given only where there is some justification in the interests of clarification. Extended bibliographic synonymies will be found in Snyder (1949) and Ernst & Araujo (1986) for termites, Princis (1964–1969) for cockroaches, and Steinmann (1989b) for earwigs. There is no comprehensive, up-to-date, synonymic bibliography for either mantids or stick-insects.

In giving the known distribution for each species, archipelagos and major island groups (or widely isolated atolls or islands) are arranged geographically, so far as is practical, from north to south and from west to east. Within larger groups, however, individual atolls or islands (and their included islets, when named) are arranged alphabetically. Palau (formerly Pelew Islands), west of 135°E., treated separately from the Caroline Islands proper, though many references (presumably on a former political basis) combined the two under the latter name. The Caroline Islands proper are arbitrarily divided here into four areas: Western (east of 135°E. and west of 145°E., e.g., the Yap Group and Ulithi Atoll), Central (145–155°E., e.g., the Hall Islands and Chuuk Atoll), Southeastern (south of 5°N. and eastwards from 155°E., e.g., Kapingamarangi and Nakuoro Atolls) and Eastern (the Senyavin Islands, i.e., north of 5°N. and eastwards from 155°E., i.e., Pohnpei, formerly Ascension Island and Ponape, and Kosrae, formerly Kusaie). Guam, though politically distinct, is included with the other Mariana Islands.

The forms of the names of several islands and groups have varied with time (and the dominant political power), so that literature references to any one island or group also differ considerably in spelling. An attempt has been made here to standardize the names in conformity with the most recent conventions (rather than to adhere to the spellings used in the original sources).

In listing, the names of archipelagos or larger groups of islands are given alone, i.e., not followed by "Is."; those of smaller groups that form units will normally be followed by "Gp."; those of atolls or individual islands will not be qualified unless they refer to small islets (such as comprise an atoll), when they will be followed by "I.". Within a given archipelago, group of islands or atoll, unless a smaller unit is

given, the reference is to that conformation in general terms. Precise localities on any particular island are not normally listed, even when they are given in the literature cited. (Exceptions are made in the case of previously unpublished records.) Thus, if an original published record was from Mt. Sasalaguan on the island of Guam, the listing here is merely as "MARIANA *Guam*". References repeating or based on earlier literature records (of which there are very many) are listed in the same manner as original citations. It will usually be obvious which are which.

In addition to Micronesian islands or groups, a number of others that might be said to "fringe" Micronesia are included as a matter of general interest. These are: Johnston Atoll (nearer to the Hawaiian Islands, but remote from them), Minami-Daito (east of the Ryukyu Islands, which are *not* included here and to which they are nearer, though separated from them by a deep ocean trench), the Talaud Islands (west of the Palau Islands and really part of eastern Indonesia), the Tuvalu or Ellice Islands (formerly administratively associated with the Micronesian Kiribati or Gilbert Islands; certain published records do not distinguish between the two groups), the Howland Islands (to the east of the Kiribati Islands) and the Phoenix Islands (southeast of the Howlands and, like them, really part of Polynesia). As there are some faunal associations between Micronesia and the islands of western Polynesia, records from still further east, from the northern Line Islands, are also taken into consideration here. The more southerly and easterly islands of Polynesia, including the southern Line Islands and the Tokelau, Cook, Society, Tuamotu and Marquesa Islands are not considered. References to Micronesian species from the "fringing" island groups are given in square brackets to avoid confusion.

## Order Dictyoptera

### SUBORDER BLATTODEA

Before considering members of individual families of Blattodea, attention may be drawn to a number of general references to Tuvalu (Ellice) Islands and Micronesian cockroaches in which names are not indicated, beginning with a passing reference by Hedley (1896: 24) to cockroaches damaging the eyes of stored, husked coconuts on Funafuti Atoll (Tuvalu Islands).

Esaki (1940b) stated that "Blattidae" (i.e., Blattodea) are widely distributed in Micronesia, but no name was used either for a species of cockroach or for a particular island or group of islands. In the same year, Yasumatsu (1940b) gave an account, not of the Blattodea, but of their hymenopterous parasitoids of the genus *Evania* (Evaniiidae). No host cockroach species was named, but many Micronesian localities were cited: *E. (E.) appendigaster* (Linnaeus, 1758) for the Mariana Islands (Guam, Pagan, Rota and Saipan), Palau Islands (Koror), central Caroline Islands (Chuuk Atoll), Senyavi-Islands (Kosrae and Pohnpei) and the Marshall Islands (Ralik Chain, Jaluit Atoll; Ratak Chain, Wotje Atoll); *E. (E.) impressa* Schletterer, 1889, for the Palau Islands (Babeldaob and Peleliu) and the western Caroline Islands (Yap Group); previously published Micronesian (and other) records were also given.

Townes (1946: 28, 29) made some general references to Micronesian cockroaches that cannot be identified from his text. For instance, he said that, in the southern Mariana Islands, there is a small, pale green species on leaves of trees with denser foliage. On the Caroline Islands and the Marshall Islands there were said to be, among foliage, "several other blattids including some pseudomopines," and that, in the Palau Islands (Peleliu), there is "an epilamprine between the bases of *Pandanus* and *Pleomele angustifolia*". Van Zwaluwenburg (1947: 18) listed "Blattidae indet." from the Kazan Islands (Iwo Jima). Bryan (1948: 30, 36, 42) referred to Micronesian cockroach literature generally, but, on his last page cited, Blattodea were lumped together with saltatorial orders as "Orthoptera" [*s. lat.*]; his second page referred to Yasumatsu's (1940b) publication on the hymenopterous cockroach parasite, *Evania*, including the various islands from which it is known, as noted above.

C. Willemse (1951: 327) referred to undetermined "Ectobiinae" and "Pseudomopinae" from the Caroline Islands generally. Usinger & La Rivers (1953: 8, 10, 12, 17, 19, 24, 28) mentioned various cockroaches from Arno Atoll in the Ratak Chain, Marshall Islands, but, though some were indicated as being domiciliary, only two were named, and then in English only (one of them incorrectly). Gressitt (1953a), in some places, mentioned particular genera or species of cockroaches for the Palau Islands, but often (his pp. 52, 59, 61, 63, 67, 68, 98, 150) there was no indication of the kinds of Blattodea to which he referred. For Onotoa Atoll in the Kiribati Islands, Moul (1954: 12, 20, 21, 22, 24) mentioned cockroaches in general, for which he noted the native name, *te babatuannanu*; he mentioned three species, but named only two. Gressitt (1954) made various references to Blattodea in Micronesia: see his pp. 136 (included in "Orthoptera" [*s. lat.*] generally), 145, 148 (Arno Atoll, reference to Usinger & La Rivers 1953, above), 151, 152, 156 (Onotoa Atoll, reference to Moul, 1954, above), 167, 168, 169 (referring to hymenopterous parasite *Evania*, reference to Moul, 1954, above). Niering (1963: 155) mentioned cockroaches from Kapingamarangi Atoll, southeastern Caroline Islands, but he named none. Hasegawa (1968: 14) referred to three species of Blattodea from the Ogasawara Islands, but a Latin name is used for only one of them. Samuelson & Nishida (1987: 160) listed nine species of cockroaches for the Marshall Islands, but they name only seven (from Enewetak Atoll).

In addition to the above general references to Blattodea, there are various dubious records in the literature relating to the genus *Blatta*. These are included in the remarks under "*Blatta* sp(p.)" below.

Superfam. **EUTHYRRHAPHOIDEA** (= LATINDIOIDEA, part)

Fam. EUTHYRRHAPHIDAE

Subfam. EUTHYRRHAPHINAE

**Euthyrrhapa pacifica** (Coquebert de Montbert, 1804)

Hebard (1922b: 336) mentioned that this species occurs on "the islands of the Pacific Ocean" [generally], but he did not indicate whether any Micronesian group

was involved. Most references to the species have been more specific as to the islands involved, though none, so far as I know, has mentioned Micronesia, and we have seen no specimen from the region, though its occurrence (for example on Guam) is to be anticipated. As it lives in soil, it may easily avoid detection (see Kevan 1980).

Superfam. **BLATTOIDEA**

Fam. **BLATTIDAE**

Subfam. **BLATTINAE**

**"Blatta" sp(p).**

*Blatta orientalis* Linnaeus, 1758, has, in the past, been credited with a much wider distribution than it really has, for, although it is associated with human habitations and widespread, it does not thrive in tropical regions, where, if the name has been used, other species were almost certainly involved.

For Micronesia, the species seems to have been first reported by Schnee (1904: 404; det. P. Kempny) as *Periplaneta orientalis* from the Marshall Islands. From experience with old records, however, I believe that this was a misuse of the name and that *P. americana* (Linnaeus, 1758) was most probably the species in question. Usinger & La Rivers (1953: 12) also reported "the Oriental cockroach" from the Marshall Islands (Ratak Chain, Arno Atoll), but this was probably a *lappus calami* for "American cockroach," i.e., *P. americana*, for Townes (1946: 28) had already observed that *B. orientalis* had not been found in Micronesia, in which he was doubtless correct. Gressitt (1954: 151) also mentioned the "Oriental cockroach" for Micronesia, but this almost certainly stemmed from Usinger & La Rivers (1953), above. Cochran *et al.* (1975: 8) and Cochran (1982: 9) commented that *B. orientalis* probably does not occur "in most of the intervening islands" between Australia and Japan. It is also of interest to note the dubious record of *B. orientalis* for the Krakatau Islands (between Java and Sumatra) mentioned by Roth (1990: 361, 363) and his suggestion that *Hebardina concinna* (Haan, 1842) might have been involved. This was, however, probably not the case for the above references.

It may also be noted here that Sakagami (1953: 26) recorded "? *Blatta* sp." from Marcus Island. This may well have been another widespread, dark-coloured blattid, *Platyzosteria (Melanozosteria) soror* Brunner von Wattenwyl, 1865, listed below. Van Zwaluwenburg's (1955: 3) reference to "*Blatta* sp." from Canton Island in the Phoenix Islands probably did not refer *P. (M.) soror*, as he listed that species, but it may have been the related *P. (M.) nitida* Brunner von Wattenwyl, 1865.

In the University of Guam insect collection, there are also reported to be specimens from the Mariana Islands (Guam and a nymph from Tinian) that have been determined by someone in the past as *B. orientalis* (Dr. Ilse Schreiner, *in litt.* X.1986), but they are doubtless incorrectly identified. We have not seen them, but we suspect that they may belong to *P. (M.) soror*.

**Dorylea unicolor** Shelford, 1910

TALAUD: Shelford (1910b: 14, incl. footnote 1); Hanitsch (1923:P 435, erroneously as synonym of "*Methana pallipalpis* [Audinet-] Serville [1838]"; 1925: 95, incl. fig. 9; 1933a: 241, as possible synonym of *D.* [now *Hebardina*] *pallipalpis*; 1936: 391, 397); Bruijning (1948: 38[, 107], as *D. pallipalpis*); Princis (1966: 470).

**? Hebardina concinna** (Haan, 1842)

PALAU: ? Schmeltz and Pöhl (1877: 19, as "*Periplaneta pallipalpis* Serv."). Under the name "*Hebardina pallipalpis* Serville, 1839" [for (Audinet-Serville, 1838)], Princis (1966: 464) cited, with a query, the original Micronesian reference given above, though he made no mention of any Micronesian island in his summary of the species' distribution. As elsewhere, Godeffroy was given as author, whereas he was, in fact, the proprietor of the relevant collection—see Introduction—and not the compiler of the catalogue of its contents! It would seem, however, that *H. pallipalpis* does not occur sufficiently far to the east to be the species involved and that Schmeltz & Pöhl (1877) probably referred to a related species. As the present whereabouts (if any) of the specimen involved is unknown to us, and as we have examined no comparable material from the Palau Islands, only an intelligent guess can be made as to its possible identity.

The specific name *pallipalpis* has been misapplied to several species of Oriental Blattidae (see Princis 1966: 442, 467, 470, 471): for *Periplaneta fuliginosa* (Audinet-Serville, 1838), ? for *Hebardina concinna* var. (as *Periplaneta*), for *Dorylea unicolor* Shelford, 1910 (see under that species above), for *D.* [formerly *Periplaneta*] *crassa* (Karny, 1908) and for *D.* [formerly *P.*] *robertsoni* (Hanitsch, 1915). Of these, we believe that *H. concinna* is as likely a candidate as any; it seems to have a wide distribution, apparently including the Philippines, with which the Palau Islands fauna has much in common. *Periplaneta fuliginosa*, which can be domiciliary and which has been widely transported through commerce, could perhaps be an alternative, though we have no evidence of its occurrence in Micronesia. *Dorylea unicolor* (above) is also a possibility as it occurs in the Talaud Islands which lie not too far to the west of the Palau Islands for its distribution to include the latter. Roth (1990: 361, 363) noted that some records of "*Blatta orientalis*" for the Krakatau Islands (see above) may have referred to the present species, but it does not seem likely that this is true for the Micronesian "*Blatta*" records.

**Neostylopyga rhombifolia** (Houttuyn in Stoll', 1813)

Syn.: *Periplaneta (Stylopyga) decorata* Brunner von Wattenwyl, 1865.

MARIANA Guam: Swezey (1946:7); Townes (1946: 29); Beller (1948: Pt. I: 3 = 6; also as *Steleopyga decorata*); *Steleopyga* Fischer von Waldheim, 1833, and *Stylopyga* Fischer von Waldheim, 1846, are synonyms of *Blatta* Linnaeus, 1758, but *Stylopyga* has sometimes been used in place of *Neostylopyga* Shelford, 1911.



The University of Guam insect collection has material of this species from Guam (Dr. Ilse Schreiner, *in litt.* X.1986).

MARSHALL (RALIK), *Enewetak*: Samuelson and Nishida (1987: 149, 170, for Enewetak I.; also 160 as *Neostylopyga* only). *Kwajalein*: Kwajalein I.: Suger-  
man (1972a: 275).

### ***Periplaneta americana* (Linnaeus, 1758)**

Seurat (1934), who occasionally referred to Micronesian islands, mentioned this species as being widely distributed in buildings and vessels in Oceania, but he did not specifically mention Micronesian localities in this connection. Townes (1946: 28) and Kevan (1990: 114) referred to *P. americana* as occurring in Micronesia generally, but no specific island or group is mentioned by either author. It is probable that this species was meant when Gressitt (1954: 151)—presumably following Usinger's & La Rivers' report from Arno Atoll, Marshall Islands (see below)—mentioned the "Oriental" (instead of "American") cockroach for Micronesia.

[JOHNSTON: Bryan (1926a: 13; 1926b: 89).]

OGASAWARA: Matsumura (1906: 15, as *Peliplaneta* [*sic*]; Shiraki (1906: 17, 24, 25); Matsumura (1913: 10, pl.2, fig 6; 1914: 118); Esaki (1930: 208, 224); Furukawa (1930: 228, 229); Matsumura (1931: 1377); Asahina (1955: 201).

KAZAN *Iwo Jima*: Asahina (1982: 329, 330).

MARCUS: Sakagami (1953: 26).

MARIANA *Guam*: Swezey (1946: 7); Beller (1948: Pt. I: 3 = 6); Dr. Ilse Schreiner (*in litt.* X.1986).

W. CAROLINE: C. Willemse (1951: 355).

C. CAROLINE, *Chuuk*: Dublon I.: C. Willemse (1951: 327, 355).

MARSHALL (GENERAL): ? Kempny *in* Schnee (1904: 404, as *Periplaneta orientalis* [*sic*], see also under *Blatta* sp(p)., above.

MARSHALL (RALIK) *Enewetak*: Samuelson & Nishida (1987: 149, 160, 170, last from Enewetak I. and Enjebi I.; 160 also as *Periplaneta* only). *Kwajalein*: Ebeye I. and Kwajalein I.: Suger-  
man (1972a: 275).

MARSHALL (RATAK) *Arno*: ? · Usinger & La Rivers (1953: 12, mistakenly as "Oriental" cockroach; also one of the domiciliary species inferred on pp. 17, 19, 28).

KIRIBATI: Manser (1974: 7; jointly with Ellice [Tuvalu] Islands).

[TUVALU: Manser (1974: 7; jointly with Gilbert [Kiribati] Islands).]

[PHOENIX *Canton*: Van Zwaluwenburg (1943: 305, 312; with hymenopterous parasite *Evania appendigaster* (Linnaeus); 1955: 2, 10, as last.)]

[LINE *Palmyra*: Krauss (1953: 218).]

### ***Periplaneta australasiae* (Fabricius, 1775)**

Townes (1946: 28), Gressitt (1954: 151, as "Australasian cockroach" only) and Kevan (1990: 114) have all referred to *P. australasiae* as occurring in Micronesia, but without mention of specific islands or groups.

OGASAWARA: Matsumura (1906: 15, as "*australiasie*" [sic]); Shiraki (1906: 17, 25, 26); Esaki (1930: 208, also 224 as "*australiasie*" [sic], referring to Matsumura, 1906); Asahina (1955: 201).

KAZAN *Iwo Jima*: Asahina (1982: 329, 330).

MARCUS: Sakagami (1953: 26).

MARIANA *Guam*: No published record noted, but Lyman Entomological Museum has a single damaged female with a pencilled label, "Guam" only—origin unknown.

PALAU: ? Schmeltz & Pöhl (1879; 25, as "*Periplaneta* sp.?"); Gressitt (1953a: 98, 149, 155).

C. CAROLINE *Chuuk*: Dublon I.: C. Willemse (1951: 327, 355).

MARSHALL (RALIK), *Enewetak*: Samuelson & Nishida (1987: 149, 160, 170, last from Enjebi I., Japtan I. and Medven I.; 160 also as *Periplaneta* only).

MARSHALL (RATAK), *Arno* Usinger & La Rivers (1953: 12, as "Australasian cockroach" only; ? also one of the domiciliary species referred to on pp. 17, 19, 28).

KIRIBATI: Zimmerman (1948: 92); Manser (1974: 7; jointly with Ellice [Tuvalu] Islands).

OCEAN GP *Nauru*: Froggatt (1910: 408).

[TUVALU: Manser (1974: 7; jointly with Gilbert [Kiribati] Islands).]

[LINE *Palmyra*: Krauss (1953; 218).]

#### Subfamily POLYZOSTERIINAE

#### *Platyzosteria* (*Melanozosteria*) *nitida* Brunner von Wattenwyl, 1865

Syn.: *Blatta aterrima* (nec Herbst, 1786) Eschscholtz, 1822

Shelford (1910b: 8), who, under the generic name *Cutilia*, gave the above synonymy with a query, indicated no Oceanian island locality for the species, although *aterrima* was described from the Marshall Islands (Ratak) by Eschscholtz (1822: 89). Princis (1966: 569, 570) similarly failed to mention Micronesian islands for the species (listed as *Melanozosteria nitida*) though he cited relevant literature. Mackerras (1968), who placed *Melanozosteria* Stål, 1874 (= *Cutilia* Stål, 1877) as a subgenus of *Platyzosteria* Brunner von Wattenwyl, 1865, did not mention *Blatta aterrima* either as a synonym of *P. (M.) nitida* or in any other regard; she also omitted any mention of Micronesian distribution. Gressitt (1954: 160, as *Cutilia*) and Kevan (1990: 114, as *Melanozostera* [sic]) both mentioned the species as occurring in Micronesia, but without reference to any specific island or group.

In the references listed below, the generic name used was *Cutilia* unless otherwise indicated.

PALAU: Gressitt (1953a: 48, 151). *Babeldaob*: Townes (1946: 28, 29).

W. CAROLINE *Ulithi*: Asor I.: Rehn (1945: 2, as *Cutilia soror* (Brunner von Wattenwyl), *lapsus*; see also C. Willemse, 1951: 355, and Princis, 1966: 570); C. Willemse (1951: 355).

C. CAROLINE *Chuuk*: Townes (1946: 28, 29); Dublon I. and Moen I.: C. Willemse (1951: 327, 355).

S.E. CAROLINE *Nakuoro*: Townes (1946: 28, 29).

MARSHALL (GENERAL): Samuelson & Nishida (1987: 160, as *Melanozosteria*; not yet known from Enewetak Atoll).

MARSHALL (RALIK) *Kwajalein*: Ennylabegan I.: Sugerman (1972a: 275).

MARSHALL (RATAK): Eschscholtz (1822: 89 & Register, p. I, as *Blatta aterrima*, type locality). W.F. Kirby (1904: 129, as *Melanozosteria Aterrima*). Arno: ? Usinger & La Rivers (1953: 10, as "wood roach" only). *Bikini*: Cole (1951: 247).

PHOENIX *Canton*: ? Van Zwaluwenburg (1955: 3, as *Blatta* sp.).

### **Platyzosteria (Melanozosteria) soror** Brunner von Wattenwyl, 1865

Shelford (1910b: 7) and Hanitsch (1915: 98, 99) mentioned *P.soror* for Melanesia and Polynesia, but not for anywhere in Micronesia. Shiraki (1931: 184) indicated a wide distribution, implying, but not actually stating, that Micronesia was included. Hanitsch (1933b: 138) and Bruijning (1948: 38), like earlier authors, again gave Melanesian and Polynesian but not Micronesian localities for the species, and, while he cited some of the relevant literature, Princis (1966: 527) also failed to mention a Micronesian island or group in his summary of the distribution of "*Melanozosteria soror*".

In the references given below, the generic name used was *Cutilia* unless otherwise indicated.

[JOHNSTON: Bryan (1926a: 13, 15; 1926b: 89); Zimmerman (1948: 90).]

WAKE: Bryan (1926a: 13, 15; 1926b: 89); Zimmerman (1948: 90).

MARCUS: ? Sakagami (1953: 26, as "? *Blatta* sp."—see also under "*Blatta* sp(p).", above).

MARIANA *Guam*: Swezey (1946: 6); Townes (1946: 28, 29); Beller (1948: Pt. I: 3 = 6). As noted under "*Blatta* sp(p).", above, some specimens from Guam and Tinian in the insect collection of the University of Guam may perhaps prove to belong to the present species.

CAROLINE (GENERAL): "W. and E.": C. Willemse (1951: 355).

W. CAROLINE *Ulithi*: Fassarai I.: Rehn (1945: 2); C. Willemse (1951: 355). Note also *lapsus* of Rehn (*loc. cit.*) in using the name *Cutilia soror* for a specimen from Asar I. which was, in fact, *P. (M.) nitida* (above).

MARSHALL (GENERAL): ? Kempny in Schnee (1904: 404, as "*Periplaneta* sp. ?").

MARSHALL (RALIK) *Enewetak*: Samuelson & Nishida (1987: 149, 170, latter from Ananij I., Bokombako I. and Enewetak I., as *Melanozosteria*; also 160 as *Melanozosteria* only). *Kwajalein*: Ennylabegan I.: Sugerman (1972a: 275).

MARSHALL (RATAK) *Bikini*: Cole (1951: 247). *Likiep*: Townes (1946: 28, 29).

KIRIBATI *Onotoa*: Moul (1954: 12, 17, 18, 23; hymenopterous parasite, probably *Evania appendigaster* (Linnaeus) also mentioned pp. 12, 17); Manser (1974: 7; jointly with Elice [Tuvalu] Islands).

OCEAN GP *Nauru*: Makerras (1968: 258, as *Platyzosteria* (*Melanozosteria*)).

[TUVALU: Chopard (1929a: 19; Nui I. noted); Fullaway & Krauss (1945: 34); Zimmerman (1948: 90); Moul (1954: 12); Manser (1974: 7; jointly with Gilbert [Kiribati] Islands).]

[PHOENIX *Canton*: Van Zwaluwenburg (1943: 305; 1955: 3).]

[LINE *Palmyra*: Krauss (1952: 218).]

Superfam. **BLABEROIDEA**

Fam. NOCTICOLIDAE

Subfam. NOCTICOLINAE

The Nocticolidae have recently been redefined and discussed by Roth (1988: 298–302) and are now placed by him in the Blaberoidea, rather than, as previously, in the Blattoidea. In Vickery & Kevan (1983: 108), it was said that the name of this family is a junior synonym of Ceuthobiidae. This was an error; the latter is the correct name for what was previously named Nothoblattidae.

**Nocticola** sp. nov.

This small, cave-dwelling species is presumed to be new. It remains undescribed because only a single female is known (Roth 1988).

PALAU *Ngergheu* (or *Ngergoi I.* north of Peleliu and east of Ngemelis): Roth (1988: 297, 300; also 299 as Micronesia only).

Fam. PANESTHIIDAE Subfam. PANESTHIINAE

**Ancaudellia serratissima serratissima**

(Brunner von Wattenwyl, 1865)

E. CAROLINE *Pohnpei*: ? Schmeltz & Pöhl (1869: 29, as *Perisphaeria* [now *Parasphaeria*] *ovata* [Blanchard, 1851], clearly in error—*Perisphaeria* Burmeister, 1838, is Ethiopian and *Parasphaeria* Brunner von Wattenwyl, 1865, is Neotropical; the resemblance to Paneschiidae is superficial); Townes (1946: 29, as “a panesthine”); C. Willemse (1951: 327, 355, as *Panesthia* sp.); Roth (1982: 35, 59 [as Caroline Is. only], 70).

TUVALU *Funafuti*: ? Hedley (1898 24, as “cockroaches” damaging eyes of stored, husked coconuts); ? Rainbow (1897: 100, as “*Panesthia aethops* [sic], Stoll,” for *P. aethiopis* (Houttuyn in Stoll’, 1813 = *Panesthia angustipennis* (Illiger, 1801), which is a S.E. Asian-Indian Ocean-New Guinean species); ? Hedley (*et. al.*: 520, as last). Princis (1965: 310) gave the Rainbow (1897) reference with a query, under *Panesthia angustipennis* (with an erroneous rendering of the latter author’s misspelling!); he gave no hint of Tuvalu or Polynesian distribution for that species. Roth (1982) mentioned no panesthiine other than *A. serratissima* for Micronesia (or Polynesia).

Fam. DIPLOPTERIDAE  
Subfam. *DIPLOPTERINAE*  
**Diploptera punctata** (Eschscholtz, 1822)

Syn.: *Diploptera dytiscoides* (Audinet-Serville, 1838)

Hebard (1933b: 123, 124), followed by Hanitsch (1933b: 142; 1936: 398), stated that this species is found from [southern] India to the Pacific, where it appears to be commoner in the east than in the west, thus, without actually saying so, implying that it occurs in Micronesia. Hebard did, however, inadvertently provide a Micronesian record which was repeated by Fullaway & Krauss (1945: 33) and by Princis (1965: 358), as will be discussed below.

In the reference below, the name used for the species is *D. dytiscoides* unless otherwise indicated.

PALAU *Babeldaob*: Gressitt (1953a: 98, 157; the locality, MeJakeiok, but not the island, is given).

C. CAROLINE *Chuuk*: Dublon I.: C. Willemse (1951: 327, 355).

E. CAROLINE *Kosrae*: C. Willemse (1951: 327, 355). *Pohnpei*: Thaxter (1902: 17; 1908: 229; both references are to "Ascension Island, South Atlantic" [*sic*] instead of "South Sea[s]", i.e., South Pacific, see below); Hebard (1933b: 123, 124, as last); Fullaway and Krauss (1945: 33, as Ascension Island, clearly following Hebard, *loc cit.* but conveniently omitting the name of the ocean!); Roth and Willis (1960: 135, as *D. punctata*; reference to Thaxter, above, and to Ascension Island, but again conveniently without reference to the ocean involved); Princis (1965: 358, as *D. punctata*; "Ascension-Insel," again without the name of the ocean, but presumably taken from Hebard, *loc. cit.* as no other relevant reference is cited). There is also a male in the Lyman Entomological Museum labelled "Caroline Is., Ponape, 1946. coll ♂". Thaxter (1902, 1908) described a fungus, *Herpomyces Diplopterae* (Laboulbeniaceae) from "*Diploptera dytiscoides*," giving the origin of the matter as "Ascension Island, South Atlantic," but, although it is a species widely distributed by commerce in the Pacific and Indian Ocean regions, there is no evidence that *D. punctata* occurs on any Atlantic island. It does not seem to be present on St. Helena (a considerable amount of orthopteroid material has been examined by the authors and by others from that island), where it might be expected to occur if it were really present on the Atlantic Ascension Island lying to its north. As indicated below, it was almost certainly mere assumption (if not carelessness) on Thaxter's part that placed the source of his material "oceans apart" from whence it really came. The name of Ascension Island in the South Atlantic is reasonably well known, whereas the use of the same European name for Pohnpei in the eastern Caroline (Senyavin) Islands of the South Pacific was falling into disuse even at the turn of the century, when Thaxter wrote.

Through the kindness of Dr. L.M. Roth, a search was made in the Museum of Comparative Zoology and also in the mycological collection of Harvard University, Cambridge, Massachusetts, for Thaxter's cockroach specimen (said to have been numbered MCZ 1371). Though various of Thaxter's insect and mycological specimens were located, however, this particular one did not come to light. Never-

theless, we can be reasonably sure that it came from the Pacific, not the Atlantic Ascension Island for the reasons indicated below.

The specimen reported by Hebard (1933b: 124) from "Ascension Island, South Atlantic" has been located, through the kind co-operation of Mr. Donald Azuma, in the Academy of Natural Sciences of Philadelphia. Its very small data label, neatly written in an unknown hand, clearly reads "Ascension Is./ South Sea". The expression "South Sea(s)" unequivocally means the South Pacific, not the South Atlantic. Hebard (1933b) was uncharacteristically careless (since he was far from ignorant) when he published his misleading misinformation!

The determination label on Hebard's specimen is also interesting. In Hebard's own neat hand, and within a black-lined border, above the printed words "Hebard Collection" are written "Diptoptera/ dytiscoides/ (Serv.)" and "Det./ Morse". That is to say, the specimen was, remarkably, not determined by Hebard himself. A.P. Morse's *original* determination label, if any, apparently had been removed at some time, but the fact that this well known New England orthopterist had determined the specimen is significant. It would most likely have been Morse who had identified Thaxter's cockroach also, for he was the handiest expert at the time (S. H. Scudder being *hors de combat*). Indeed, Morse may have provided Thaxter with the infected cockroach in the first place. Hebard (1933b) did not indicate whence he had acquired his specimen, but he certainly corresponded (and probably exchanged material) with Morse. I am therefore convinced that Thaxter's (1902) and Hebard's (1933b) specimens originated from the same source. It is even possible, as Thaxter's specimen cannot be located where it was deposited, that the two might be identical. In any event, there is every reason to believe that Thaxter's, as well as Hebard's, material came from Pohnpei and not from the Ascension Island in the South Atlantic.

Fam. NAUPHOETIDAE (= OXYHALOIDAE, *auctt.*)

Subfam. NAUPHOETINAE

**Nauphoeta cinerea** (Olivier, 1789)

PALAU *Babeldaob*: Kevan (1990: 119). The detailed data for the two specimens—male and female—involved (University of Guam insect collection and Lyman Entomological Museum, respectively), in addition to the island group and island, are: "Palau Airport, 8.IX.1986, intercepted A. Albert. Via 'Air Nauru' from Manila [Philippines]".

Subfam. PYCNOSCELINAE

**Pycnoscelus indicus** (Fabricius, 1775) and/or

**Pycnoscelus surinamensis** (Linnaeus, 1758)

Syn.: *Epilampra dimorpha* Shiraki, 1906

*Calolampra dimorpha*; Shelford, 1910

Roth & Willis (1961) gave evidence that many of the previous "*Pycnoscelus surinamensis*" records for the Pacific region referred, in fact, to the "bisexual

strain," that is to say, to *P. indicus*, as recognized by Roth (1967). Nevertheless, as both occur together in the Hawaiian Islands and elsewhere, it would be very presumptuous, without a thorough investigation of all available relevant material, to favor one species over the other in the records given below. It can only be said that the parthenogenetic *P. surinamensis* seems to occur on Guam, but, as I have seen no Micronesian male, I cannot personally confirm (or deny) that *P. indicus* does not also occur there or elsewhere. Asahina (1982: 329) records a male from Iwo-Jima in the Kazan Islands, so that the latter species occurs there at least, though he called it *P. surinamensis*.

Townes (1946: 28) noted that "*P. surinamensis*" is generally distributed in Micronesia, but usually restricted to the vicinity of buildings, roadsides or the edges of fields, but he mentioned no particular island or group, and there is no way of knowing (without recourse to his specimens), whether he referred to both species or only to one. Princis (1964: 263–273), who, at the time, regarded the spelling of the generic name *Pycnoscelus* as a *lapsus calami* for *Pycnoscelis* (see Kevan, 1980: 31, for clarification) and who, as was then customary, regarded *indicus* as a junior synonym of *surinamensis*, cited some of the relevant Micronesian literature. Nevertheless, he did not, when summarizing the species' distribution, indicate that this included Micronesia; only that it was circumtropical and of Oriental origin—though it also occurs in greenhouses in temperate countries. Kevan (1990: 114) referred to *P. surinamensis* as occurring in Micronesia, but he mentioned no specific island or group; he did not refer to *P. indicus*.

In the references given below, the generic name was correctly spelled "*Pycnoscelus*" and the specific name was given as *surinamensis* unless otherwise indicated.

[JOHNSTON: Bryan (1926a: 13; 1926b: 89); Zimmerman (1948: 94); Roth and Willis (1961: 21; implication that the "bisexual strain," i.e., *P. indicus*, was chiefly involved).]

WAKE: Bryan (1926a: 15; 1926b: 89).

OGASAWARA: Shiraki (1906: 17, 22, 23, pl. II, figure 6, as *Epilampra dimorpha*, n. sp.); Shelford (1910a: 10, as *Calolampra dimorpha*; only "Japan" given for distribution); Matsumura (1913: 12, pl. 2, figure 10, as *Calolampra (Epilampra) dimorpha*; 1914: 118, as *Epilampra dimarpho [sic]*); Esaki (1930: 207, as *Epilampra dimorpha*); Furukawa (1930: 230, synonymy established, but as *Leucopeaea [sic]*, not *Leucophaea* as in Princis, 1964: 268); Shiraki (1931: 177, as *Leucophaea*; *Epilampra dimorpha* synonymized); Matsumura (1931: 1375, figure [5], 1376, as *Leucophaea*); Katô (1932: pl.5, figure 2, as *Leucophaea*); Shiraki (1932: 2043, figure [1], as *Leucophaea*); Matsumura (1933: 35, as *Leucophaea*); Shiraki (1950: 56, figure 140, as *Leucophaea*); Ishihara (1954: 2, as *Leucophaea*); Asahina (1955: 200, as *Leucophaea*).

KAZAN Iwo-Jima: Asahina (1982: 330; as the only adult recorded was a male, we must assume that only *P. indica*, not *P. surinamensis* was involved).

MARIANA Guam: Swezey (1946:7); Beller (1948: Pt. I: 3 = 6); Dr. Ilse Schreiner (*in litt.* X.1986, as *P. sp.*, ? *surinamensis*).

PALAU: Schmeltz & Pöhl (1869: 29, as "*Epilampra* sp.?"), Gressitt (1953a: 63, as *Pycnoscelus* only, 98, 155, 156; the "black cockroach" [nymphs], pp. 52, 61, probably refer also).

CAROLINE (GENERAL): Frogatt (1910: 409, as "Carolinas" [sic], not an error for Carolina [or Caroline] Island in the southern Line Islands); Zimmerman (1948: 94).

C. CAROLINE *Chuuk* Dublon I: C. Willemse (1951: 327, 355 [no Dublon I. on latter p.], as *Pycnoscelis* [sic]).

E. CAROLINE *Kosrae*: Dr. Ilse Schreiner (*in litt.* X.1986, as *P.* sp. ? *surinamensis*).

MARSHALL (RALIK) *Ailinghapalap*: Jabvat (= Jabwot) I.: Ehrhorn (1939: 196). *Enewetak*: Roth and Willis (1961: 121; implication that *P. surinamensis*, *s.str.*, was chiefly involved); Samuelson and Nishida (1987: 149, 170, latter from Ananij I., Elugelab I., Japtan I., Enewetak I. and Medren I., as *Pycnoscelis* [sic]; also 160 as *Pycnoscelis* [sic] only). *Jahuit*: Ehrhorn (1939: 191). *Kwajalein*: Kwajalein I, and Roi-Namur I.: Sugerman (1972a: 275).

MARSHALL (RATAK) *Bikini*: Cole (1951: 247).

KIRIBATI: Zimmerman (1948: 94); Manser (1974: 7, as *Pycnoscelis* [sic]; jointly with Ellice [Tuvalu] Islands).

OCEAN GP *Nauru*: Froggatt (1910: 408).

[TUVALU: Manser (1974: 7, as *Pycnoscelis* [sic]; jointly with Gilbert [Kiribati] Islands).]

[PHOENIX *Canton*: Van Zwaluwenburg (1943: 305; 1951: 3).]

[LINE *Kiritimati*: Krauss (1953: 218, as "probably *Pycnoscelus surinamensis*," though more likely to be *P. indicus*).]

#### Fam. EPILAMPRIDAE

##### Subfam. PHORASPIDINAE

#### **Haanina pelewensis** (Saussure, 1895)

Gressitt (1954: 160), as *Homalopteryx pelewensis*, referred to this species as occurring in Micronesia, but without specific reference to island or group.

In the references below, the same name is used unless otherwise indicated.

PALAU: Schmeltz & Pöhl (1879: 65, as "*Homalopteryx* sp.?"); Saussure (1895: 341, 342); W.F. Kirby (1904: 115, as *H. Pelewensis*); Shelford (1910a: 8); C. Willemse (1951: 355); Gressitt (1953a: 98, 154); Princis (1967: 642, as *Haanina*). *Angaur*: C. Willemse (1951: 325, 326, 355, 361, pl. 9, figure 1, as var. *atropunctata* nov. var.); F. Willemse (1966: 31, as *H. p. artropunctata* [sic] n. var. [sic], without locality); Princis (1967: 642, as *Haanina pelewensis* var. *atropunctata*). *Babeldaob*: C. Willemse (1951: as above; locality Melekeiok). *Peleliu*: ? Townes (1946: 29, as "an epilamprine between the leaf bases of *Pandanus* and of *Pleomele angustifolia*").

#### **Pseudoplatia atra** Hanitsch, 1930

The description of this species was published again (as a new species) in 1931.



TALAUD: Hanitsch (1936: 390, 395; also from neighbouring Sangihe Islands to the west); Bruijning (1947: 209 only; also Sangihe Islands); Princis (1967: 646).

Subfam. *EPILAMPRINAE*

**Stictolampra concinula** (Walker, 1859)

TALAUD: Princis (1967: 685). *Karakelong*: Bruijning (1947: 209, 227, 228, as *Rhabdoblatta*, from Beo); Princis (1957: 138, as *S. buqueti concinula*).

Superfam. *ECTOPIOIDEA*

Fam. *BLATTELLIDAE*

Subfam. *PSEUDOPHYLLODROMIINAE*

**Balta notulata** (Stål, 1858)

This species has been placed under a number of different generic names, including *Lupparia* Walker 1868, *Onychostylus* Bolívar, 1897, and *Graptoblatta* ebard, 1929 (see Princis 1969, Asahina 1973a), but it has now settled in *Balta* Tepper, 1893 (see Roth 1990). There could be, but probably is not, an element of doubt regarding the validity of the earlier literature records, as Asahina (1973a), who treated this and similar species, did not refer to Micronesia. Kevan (1990: 114, as *Onychostylus* or *Luppova* [*lapsus calami*]), from the literature, noted that *notulata* occurs in Micronesia, but mentioned no island or group.

The literature references given below use the name *Graptoblatta notulata* unless otherwise indicated.

MARIANA Southern: Townes (1946: 28). *Guam*: Swezey (1946: 6); Townes (1946: 28); Beller (1948: Pt. I: 3 = 6); Princis (1969: 958, as *Lupparia*; citing Swezey, 1946, but not mentioning Guam or Micronesia as such). *Tinian*: Roth (1990: 366, 367, figure 6, 368, figure 7, as *Balta*; specimen seen, exact Tinian locality is Purtan Laminibot).

CAROLINE (GENERAL): Townes (1946: 28).

MARSHALL (GENERAL): Townes (1946: 28).

MARSHALL (RALIK) *Enewetak*: Samuelson & Nishida (1987: 149, 170, latter from Bokombako I. and Japtan I.; as *Lupparia*; also p. 160 as *Lupparia* only).

MARSHALL (RATAK) *Arno*: ? Usinger & La Rivers (1953: 10, as "wood roaches" only); ? Gressitt (1954: 150, as last).

**Balta pallidiola boninensis** (Asahina, 1985)

Syn. *Phyllodromia vilis*; auctt., nec Brunner von Wattenwyl, 1865.

Like the previous species, *Phyllodromia pallidiola* Shiraki, 1906, has been moved from one genus to another, including *Onychostylus* Bolívar, 1897, and *Megamareta* Hebard, 1943. There has also been confusion in the literature over the identity of this subspecies, it having been mistaken for *B. vilis* (below) insofar as the Ogasawara Islands are concerned. The evidence seems to indicate that *B. vilis*

does not occur there, but, so far as Micronesia is concerned, only in the Kazan Islands (specifically Iwo-Jima). Asahina (1985b), in describing this subspecies, transferred what he had previously (Asahina 1973a) called *Megamareta pallidiola* (Shiraki, 1906) back into *Onychostylus*. This, in turn, was synonymized by Roth (1990) with *Balta* Tepper, 1893.

OGASAWARA: Shiraki (1906: 17, 20, 21[, pl. II, figure 1], as *Phyllodromia pallidiola*, part); Shelford (1908: 12, as last; "Japan" only); Matsumura (1913: 8 [pl. 2, figure 1], as *Periplaneta [lapsus] pallidiola*, part; 1914: 118, as *Phyllodromia pallidiola*, part); Esaki (1930: 207, as *Phyllodromia pallidiola*); Kurukawa (1930: 229, as *Blattella pallidiola*); Shiraki (1931: 201, as *Phyllodromia vilis*, part, erroneously making *pallidiola* a synonym of this); Furukawa (1948: 176, as *Mareta vilis*); Ishihara (1954: 3, 5, as *Phyllodromia vilis*); Asahina (1955: 204, part, as *Blattella vilis*, with *pallidiola* as synonym; 1965: 7, 8, figure 1-10, 9, 10, 14, figure 30 [map], as *Onychostylus pallidiolus*); Hasegawa (1968: 14, as *Onychostylus vilis*); Princis (1969: 990, 991, as *Megamareta pallidiola*, part); Asahina (1973a: [196, figure 3, 197, figure 10,] 198, part, Ogasawara Islands not specifically mentioned—only as "Japan"; similarity to *Megamareta verticalis* Hebard, 1943, noted; 1985b: 2, 3, figure 1-8, 4, 8, as *Onychostylus pallidiolus boninensis* subsp. nov., from Chichi-Jima, Haha-Jima and Ogasawara I.).

#### **Balta vilis** (Brunner von Wattenwyl, 1865)

*Balta vilis*, like the two previous species, has been placed in different genera, including *Lupparia* Walker, 1868, and *Onychostylus* Bolívar, 1897, but it has been transferred to *Balta* Tepper, 1893, by Roth (1990). Shiraki (1931: 201) incorrectly synonymized his own *Phyllodromia pallidiola* Shiraki, 1906, from the Ogasawara Islands, with *vilis*, so that several Micronesian references to the latter species are incorrect (see Princis 1969: 991; and above). Princis (1969: 960), with a query, also synonymized *Phyllodromia ogatai* of Shiraki (1931: 202, figure 16), from the island of Kotosho (immediately southeast of Taiwan), with "*Lupparia vilis*". Whether the synonymy is correct remains to be seen. So far, *B. vilis* is known in Micronesia (as a mainly domiciliary species) only from a single island.

KAZAN *Iwo-Jima*: Anonymous (1958: 80, as *Onychostylus*); Asahina (1965: 12, 13, figure 20-26, 14, figure 30 [map], as *Onychostylus*); Princis (1969: 960, as *Lupparia*); Asahina (1973a: 196, figure 5); Cochran et al. (1975: 23, as *Lupparia*); Cochran (1982: 24, as *Lupparia*, one mention as *L. Vilis*); Roth (1990: 369, figure 8, 370, 371).

#### **Balta** spp.

MARIANA Southern: ? Townes (1946: 28, as "a small pale green [*sic*] species on leaves of trees with denser foliage").

PALAU *Peleliu*: Dr. L.M. Roth (*in litt.* XII.1986, as *Balta* sp. [3]; referring to a male in the University of Guam insect collection, dated 15.V.1984, coll. I.

Schreiner). If the species is not new, the specimen is perhaps more likely to belong to *B. jacobsoni* (Hebard, 1929), known from Malaysia, Indonesia and the Philippines, than to *B. similis* (Saussure, 1869), from New Guinea, the Cocos Islands, Samoa and (as an introduction) the Hawaiian Islands.

[LINE *Kiritimati*: Krauss (1953: 218, as "Genus uncertain, *Balta* or near").]

### **Margattea n. sp(p).**

*M. remota* (Hebard, 1933) is known from the Marquesa and Society Islands of Polynesia, but the specimens noted below do not appear to belong to that species. It is possible that the "pseudomopines among foliage" recorded by Townes (1946: 29) from the Caroline and Marshall Islands generally may have belonged to the same species as the following.

MARIANA *Guam*: "2 mi. S.E. of Agona, 3.VI.1969, I[van] De Soto coll.", 1 ♀ (University of Guam insect collection).

E. CAROLINE *Kosrae*: "Mulau, 15.XI.1984, tangerine sweep, D. Nafus coll.", 1 ♀ (University of Guam insect collection).

### **Megamareta fascifrons** (Chopard, 1929)

? Syn.: *Megamareta salomonis* Princis, 1970

*Lupparia adimionalis*; auctt., nec Walker, 1868

As already noted, the generic names *Lupparia* Walker, 1868, *Balta* Tepper, 1893, *Onychostylus* Bolívar, 1897, *Megamareta* Hebard, 1943, have been the basis of considerable taxonomic confusion. Asahina (1973a) discussed some of the problems and, although he did not synonymize *Megamareta* with *Onychostylus*, he considered on the evidence available that the former was well not founded. Roth (1990), however, accepted *Megamareta* though he synonymized *Onychostylus* with *Balta*. Both authors declined to accept Princis' (1969) synonymy of any of the other genera with *Lupparia*, though they agreed that they were closely related. *Lupparia* is currently regarded as being monotypic. The type species, *L. adimionalis* (an error for *abdominalis*?), Walker, 1868, has been reported from Micronesia (Guam), but presumably erroneously (see below).

Asahina (1973a: 196, figure 6, 199) indicated that what he believed to be the same species as *Mareta* [now *Megamareta*] *fascifrons* Chopard, 1929, originally described from Samoa, was found in Micronesia (generally, on the pages indicated above). The species was said to differ from *Balta notulata* (Stål, 1853), which has been reported on several occasions from Micronesia (see above). Asahina (1973a), however, gave only the Ryukyu Islands as its distribution, even though the range is known to be much wider.

MARIANA *Guam*: Swezey (1946: 6, as *Lupparia adimionalis*); Townes (1946: 29, reference as last); Beller (1948: Pt. I: 3 = 6, as *Lupparia adimionalis*); Asahina (1973a: 197, figure 21). *Tinian*: Dr. L.M. Roth (*in litt.* XII.1986, tentatively as *Balta* sp. [2]), with data "C.M.N.I. Tinian: Unai Chulu, 22.XI.1984, coll.

L. Ellis Neill" and "C.M.N.I. Tinian: Dump area. 24.XI.1984, col. C.D. Bjork"; both females, both from University of Guam insect collection.

C. CAROLINE *Chuuk*: Asahina (1973a: 187, figure 24).

E. CAROLINE *Kosrae*: Asahina (1973a: 197, figure 22, 23).

### ***Supella longipalpa* (Fabricius, 1798)**

Syn.: *Supella supellectilium* (Audinet-Serville, 1838)

Kevan (1990: 114) mentioned this species as occurring in Micronesia, but no specific island or group was named.

OGASAWARA *Chichi-Jima*: Asahina (1973b: 123, 124, figure 1–3, 128; noted as having been first taken in 1969; 1985a: 24, figure 22–26, 25, 26, as last).

MARIANA *Guam*: Swezey (1946: 6, as *S. supellectilium*); Townes (1946: 28, as *S. supellectilium*); Beller (1948: Pt. I: 3 = 6, as *S. supellectilium*); Dr. Ilse Schreiner (*in litt.* X.1986).

KIRIBATI: Manser (1974: 7; jointly with the next).

[TUVALU: Manser (1974: 7; jointly with the last).]

[PHOENIX *Canton*: Van Zwaluwenburg (1943: 305; 1955: 3; both as *S. supellectilium*).]

### Subfam. *BLATTELLINAE*

### ***Blattella germanica* (Linnaeus, 1767)**

It is difficult to be sure if all Micronesian records naming this species do, in fact, refer to it and not to *B. lituricollis* (Walker, 1868), below—or *vice versa*—but those attributed to Roth (1985) are reliable. Townes (1946: 28) recorded *B. germanica* from Micronesia generally (about stores and naval bases), but he named no specific island or group.

WAKE Wake I.: Roth (1985: 26).

OGASAWARA: Matsumura (1914: 118, as *Phyllodromia*); Furukawa (1930: 229, as *Blattella* [*sic*]); ? Hasegawa (1968: 14, no Latin name, as equivalent of "small winged cockroach").

MARIANA *Guam*: Swezey (1946: 6; some, at least, misidentified as next species); Beller (1948: Pt. I: 3 = 6, as *Blattella* [*sic*], as last); Dr. Ilse Schreiner (*in litt.* X.1986; in University of Guam insect collection; species could be mixed). *Tinian*: Roth (1985: 22); Dr. Ilse Schreiner (*in litt.* X.1986; in University of Guam insect collection).

CAROLINE (GENERAL): Roth (1985: 22).

E. CAROLINE *Pohnpei*: C. Willemse (1951: 326, 355, as *B. lituricollis*; see next reference); Roth (1985: 22). In the last reference there is a record of a female from "Ascension Island". As this name was formerly applied to Pohnpei, as well as to the better known island in the South Atlantic (see discussion under *Diploptera punctata*, above), the record may well be Micronesian in the absence of evidence to the contrary.

MARSHALL (GENERAL): Samuelson & Nishida (1987: 160 based on next reference).

MARSHALL (RALIK) *Kwajalein*: Kwajalein I. and Roi-Namur I.: Sugerman (1972a: 275). As Sugerman listed separately what he believed to be *B. lituricollis*, this record for *B. germanica* is doubtless correct.

### ***Blattella lituricollis* (Walker, 1868)**

Specimens of "*B. germanica*" collected away from the vicinity of human habitations probably belonged to the present species, particularly where association with growing crop plants was indicated, as in Swezey (1946) and Beller (1948). The two species are very similar, *B. lituricollis* being slightly the smaller and more delicate (for details, see Roth, 1985). The Caroline Islands record of that species given by C. Willemse (1951: 326, 355), however, apparently referred to *B. germanica* (see Roth, 1985: 22). Townes (1946: 28) noted that the present species occurs in Micronesia generally (among grass and along roadsides, etc.; also at airports and in buildings, though these more probably involved *B. germanica*); he named no specific island or group for this species.

[JOHNSTON Johnston I.: Roth (1985: 13, 14, 65).]

WAKE Wake I.: Roth (1985: 13, 14, 67).

OGASAWARA: ? Hasegawa (1968: 14, as equivalent of "Ogasawara cockroach" only); Roth (1985: 13, 14, as "Bonin Island" [*sic*]). *Chichi-Jima*: Roth (1985: 65).

KAZAN *Iwo-Jima*: Roth (1985: 13, 14, 65; last p. adds "Volcano Island" [*sic*] instead of *vice versa*).

MARCUS: ? Sakagami (1953: 26, as "? *Blattella* sp.").

MARIANA: Roth (1985: 13, 14, 66). *Guam*: Beller (1948: Pt. I: 3 = 6, as *Blattella* [*sic*]; ? also as *B. germanica*, part); Roth (1985: 13, 14, 54; noted that a male from Merizo and determined by O.H. Swezey as *B. germanica* was included). *Saipan*: Roth (1985: 13, 14, 66); *Tinian*: Roth (1985: 13, 14, 67).

PALAU *Angaur* and *Koror*: Roth (1985: 65 only).

W. CAROLINE *Yap Gp* Yap I.: Roth (1985: 13, 14, 67).

C. CAROLINE *Chuuk* Moen I.: Roth (1985: 13, 14, 67).

E. CAROLINE *Pohnpei*: dubious record by C. Willemse (1951: 326, 355) as this species, but apparently incorrect, at least in part—see under *B. germanica*.

MARSHALL (RALIK) *Enewetak*: Roth (1985: 13, 14, 64; last p. adds Japtan I.); Samuelson and Nishida (1987: 149, 170, latter from Enjebi I. and Japtan I.; also 160 as *Blattella* only). *Kwajalein*: Roth (1985: 13, 14, 65); Enubuj I. and Kwajalein I.: Sugerman (1972a: 375, as apparently this species).

MARSHALL (RATAK) *Majuro*: Roth (1985: 13, 14, 65).

### ***Lobopterella dimidiatipes* (Bolívar, 1890)**

W. CAROLINE *Ulithi* Asor I.: Rehn (1945: 2, as *Loboptera*); C. Willemse (1951: 355, as *Loboptera*). Princis (1969: 856) cites these references but makes no mention of Micronesian islands in his distribution summary for the species.

[TUVALU *Funafuti*: ? Rainbow (1897: 100, as "*Loboptera decipiens*, Germ." = Germar, 1817, a Palearctic species!); ? Hedley *et al.* (1899: 520, as last, but author of species given as "Germain" [*sic*]). Princis (1969: 851) gave the Rainbow (1897) reference (with a query) under *Loboptera decipiens*, despite his indication of the distribution of that species as being entirely Palearctic!]

### **Symploce pallens** (Stephens, 1829)

Syn.: *Symploce hospes* (Perkins, 1899). See Vickery & Kevan (1983: 181–182) for fuller synonymy.

As this species has long been present in the Hawaiian Islands and was, indeed, described thence under the synonym *Phyllodromia hospes*, it is probable that the Micronesian populations, at least that of Guam, originated there.

MARIANA *Guam*: Swezey (1946, as *S. hospes*); Beller (1948: Pt. I: 3 = 6, as *S. hospes*). We have also seen a male from Guam with the data "Yigo, light trap, 26.VI.1969, coll. Ivan De Soto" (University of Guam insect collection).

C. CAROLINE *Chuuk*: Moen I.: two males collected by A. Bowdenk, 15.VII.1985 (University of Guam insect collection and Lyman Entomological Museum).

[HOWLAND *Howland*: Roth (1985: 61; 1986: 191).]

[PHOENIX *Canton*: Roth (1984: 61; 1986: 191).]

[LINE *Jarvis*: Roth (1984: 1984: 61; 1986: 19).]

### SUBORDER MANTODEA

Esaki (1940b: 407) mentioned the occurrence of mantids in Micronesia, stating that they were found there only in the Palau Islands (with which he associated the Yap Group of the western Caroline Islands). It is probable, but not certain, that Esaki referred to the small, native mantid which was later described as *Acromantis palauensis* by Beier (1972). The latter author, as indicated by Kevan (1987), published a fairly comprehensive account of the Micronesian mantids. He did not, however, include all the species now known to occur there, and he gave no reference to any previous literature record.

Gressitt (1954: 158, 160, 164, 189) made several mentions of "preying" (*sic*) mantids in Micronesia, indicating that, except for the Palau Islands, they had been introduced (by human agency)—Guam and Saipan in the Mariana Islands and Chuuk Atoll in the central Caroline Islands; "at least three kinds" into the first of these islands and one into each of the others. He named none, however, giving the impression (his pp. 158, 189) that he believed that the Palau Islands species to which he referred was indigenous. Nevertheless, on his p. 158, which noted that only two additional species of mantids had been introduced, he indicated that the Palau species was one of those that had been introduced into the other islands mentioned above. This was not the case with the native *A. palauensis* and he therefore doubtless referred to some transference of the introduced species, *Orthodera burmeisteri* Wood-Mason, 1889, which has also been present in the Palau Islands

for a considerable time. The various introduced mantid species are listed below. Samuelson & Nishida (1987: 16) stated that "the only mantid endemic to Micronesia is from Palau". They referred, of course to *A. palauensis*, though they did not name it.

Superfam. **MANTOIDEA**

Fam. **HYMENOPODIDAE**

Subfam. **ACROMANTINAE**

**Acromantis palauensis** Beier, 1972

Although described only in 1972, this species was recorded in the literature decades previously, a fact which Beier (1972) omitted to mention.

**PALAU:** Esaki (1940b: 407, unnamed mantid, presumably this species); Townes (1946: 29, as "a small mantid in the Palaus"); C. Willemse (1951: 355, misidentified as *Anaxarcha graminea* Stål, 1877; "E. Carol." for *W.* Caroline, including Palau, Islands); Samuelson and Nishida (1987: 160, mentioned, but not named, see above); Kevan (1990: 112). **Koror:** Beier (1972, 173, 174, incl. figure 1, 175; type locality). **Peleliu:** C. Willemse (1951: 328, 355, misidentified as *Anaxarcha graminea* Stål, 1877); Beier (1972: 175).

As noted above, Gressitt's (1954: 158, 189) references to Palau Islands mantids were to some extent equivocal, but they probably referred to the next, rather than to the present, species.

Fam. **ORTHODERIDAE**

This taxon is usually regarded as a subfamily of Mantidae, but Roy (1987) considered that it merited full family status.

Subfam. **ORTHODERINAE**

**Orthodera burmeisteri** Wood-Mason, 1889

As indicated above, Gressitt (1954: 158, 160, 164, 189) referred to this species (presumably) as one of the "preying" (*sic*) mantids from Micronesia, without mentioning a specific group or island. Kevan (1990: 112) referred to *O. burmeisteri* as being introduced into Micronesia, but he, too, named no island or group.

**WAKE** Peale I.: Beier (1972: 174). Wake I.: Kevan examined the following: 2, XI.1957, N.L.H. Krauss coll. (University of Guam insect collection); 5 oöthecae (as last, but I-II.1957, in Lyman Entomological Museum). Wilkes I.: Beier (1972: 174).

**OGASAWARA** *Chichi-Jima*: Beier (1972: 173).

**MARIANA** *Guam*: Gressitt (1954: 158, 189, as "mantid" only); Beier (1972: 173); Dr. Ilse Schreiner (*in litt.* X.1986, including pink form). *Saipan*: Gressitt (1954: 158, 189, as "mantid" only); Beier (1972: 173); also seen, 1 ♀, 1 oötheca, II.1958, N.L.H. Krauss coll. (University of Guam insect collection). *Tinian*: Gressitt (1954: 158, 189, as "mantid" only); Dr. Ilse Schreiner (*in litt.* X.1986).

PALAU: Gressitt (1954: 158, 160, 164, as "a preying [*sic*] mantid" only; also 189 as "mantid" only). *Angaur*, *Babeldaob*, *Koror* and *Peleliu*: Beier (1972: 173). The species also featured in a British Broadcasting Corporation television programme about the islands, mostly filmed on Babeldaob (? in 1982, film released 1983/84).

W. CAROLINE *Yap Gp.* Yap I.: Dr. Ilse Schreiner (*in litt.* X.1986). Beier (1972: 173) lists "Yap" but refers only to Chuuk Atoll, below.

C. CAROLINE *Chuuk*: Moen I.: Beier (1972: 173).

E. CAROLINE *Pohnpei*: examined, 1 ♀, labelled as follows: (1) "MICRONESIA: Caroline Isl's. Senyavin Isl's. Ponape Isl. N. end Ponape, Takai Mwas Ridge above Luhka. ca. 350 m. 6°56'38"N. 158°15'00"E. 26 Feb.-6 Mar. 1987. loc. #16 (Otte, Alexander, Flinn)"; (2) "Captured in forest".

MARSHALL (GENERAL): Samuelson and Nishida (1987: 160).

MARSHALL (RALIK). *Kwajalein*: Beier (1972: 173); also seen, 2 ♀♀, 19.II.1958, N.L.H. Krauss coll. (University of Guam insect collection); 1 oötheca, same data (Lyman Entomological Museum).

Fam. MANTIDAE

Subfam. *MANTINAE*

***Hierodula patellifera*** (Audinet-Serville, 1838)

As this species occurs as an introduction in the Hawaiian Islands (Zimmerman, 1948: 102), there has been some speculation that it may also be found on Guam, but there is no evidence to support this so far. The nearest record to Micronesia of which I am aware is the following:

MINAMI-DAITO: Yashiro (1939: 29, as *Hilrodula* [*sic*]).

***Polyspilota aeruginosa*** (Goeze, 1778)

This seems to be a very recent introduction (ultimately of African origin). It is not included in Beier's (1972) list.

MARIANA *Guam*: Kevan (1990: 112; specimens in University of Guam collection).

***Statilia pallida*** Werner, 1922

This Philippine species is very close to *S. nemoralis* (Saussure, 1870), which is widely distributed in tropical Asia. It differs in markings.

MARIANA *Guam*: ? Gressitt (1954: 158, 189; one of the unnamed introduced mantid species); Beier (1972: 173, 174); Dr Ilse Schreiner (*in litt.* X.1986, said to be "by far the most common mantid [in the Marianas]" and that "we cannot find any record that it was deliberately introduced . . ."); Kevan (1990: 112, 118; deemed an accidental introduction from the Philippines). *Tinian*: Dr. Ilse Schreiner (*in litt.* X.1986). A small female examined is labelled: "Tinian, NMI/ Carolina [*sic*]:



6.I.[19]85. [coll.] J.A. T. & C.D. B[jork]" (in Lyman Entomological Museum, *ex* University of Guam insect collection; originally determined by an unknown person as "*Hierodula pallidula*," but we know of no mantid with that specific name).

### ***Tenodera angustipennis* Saussure, 1869**

Beier (1972) did not list this species for Micronesia. Kevan (1990: 112) indicated that it was apparently a recent introduction. It could have reached the Mariana Islands from almost anywhere in southeastern Asia or possibly indirectly thence (and as a deliberate introduction) from the continental United States of America, where it has long been established. It would not have come from the Hawaiian Islands, where it was formerly thought to occur (see Zimmerman, 1948), for, as Maehler (1953: 5) observed, the Hawaiian (introduced) species is, in fact, the rather similar *T. australasiae* (Leach, 1814), below.

MARIANA *Guam*: Dr. Ilse Schreiner (*in litt.* X.1986; noting also that *T. australasiae*, "which is supposed to be here [meaning in the Mariana Islands generally, or on Guam specifically] is at the very least not common any more."); Kevan (1990: 112). *Saipan*: Examined: 1 ♀, "Saipan; 10.X.1971; At light; R. Muniappan collector" (Lyman Entomological Museum; *ex* University of Guam insect collection).

### ***Tenodera australasiae* (Leach, 1814)**

Bruner (1915: 226) indicated that what he named as *Tenodera costalis* (Blanchard, 1853) is "quite general over Oceanica [*sic*]," which would seem to apply instead to the present species. Kevan (1990: 112) mentioned that *T. australasiae* occurred in Micronesia, but without reference to specific islands or groups. The introduction of this species into Micronesia, apparently of earlier date than that of the preceding species, could have been from the Hawaiian Islands, where it is an established introduction (Maehler, 1953: 5), as noted above.

MARIANA *Guam*: Maehler (1953: 5; "ootheca of what is probably this species"); Gressitt (1954: 158, 189; one of the unnamed introduced mantid species); Beier (1972: 173, 174). Unlike Beier (1972), whose record is presumably reliable, I have seen no Micronesian specimen of *T. australasiae*, which perhaps may have been ousted by *T. angustipennis* (Schreiner, *in litt.* above, under that species).

### ***Tenodera sinensis* Saussure, 1871**

Syn.: *Tenodera aridifolia sinensis*, *auctt.*

*Tenodera capitata*, Matsumura, 1906, *nec* Saussure, 1869

It is still uncertain whether or not *T. sinensis* is a valid species or merely a subspecies of *T. aridifolia* (Houttuyn *in* Stoll', 1813), of which it was originally described as a variety. Usage has been inconsistent from the start, but Dr. Max Beier, perhaps the foremost modern expert on mantid taxonomy, though he also was inconsistent, generally favoured the subspecific status (Beier, 1972 and later). Both he (1972: 173,

174) and Kevan (1990: 112), following him, used "*T. aridifolia sinensis*" for the Micronesian form, the latter author without specific mention of island or group.

Rehn (1903:705, 706), though he had examined the type specimens of neither, was quite definite that two species were involved: "after comparison of *sinensis* with *aridifolia*, there can be no doubt that they represent very distinct species." He placed both in his new genus *Paratenodera* and, though this is no longer generally recognized, some recent authors, particularly in the Orient, continue to use that generic name and to accept both species. Among such are Yan et al. (1961), who clearly distinguish between what they regard as *P. sinensis* and *P. aridifolia*, both morphologically and bionomically. It would seem, however, that their "*aridifolia*," on the basis of its description (all in Mandarin), including hind-wing pigmentation and the form of the oötheca (figured) are, in fact, more in keeping with *sinensis* proper. Their "*sinensis*", with its paler wings and a characteristic oötheca (also figured), seems to belong to some other species, possibly true *aridifolia*, with which I am not familiar.

The difference between *aridifolia* and "var. *Sinensis*," in the original description of the latter, would appear to be such that two, rather than one, species are indeed involved. Stoll's original specimen might possibly still be in existence in the Leiden Museum (where other of Stoll's material has survived), but we are not aware that it has ever been sought, let alone located. Without comparison with a type (or, if need be, the establishment of a neotype), the problem remains unresolved. For the present, however, we prefer to recognize two distinct species, for they are said to have widely overlapping geographical distributions, such as was indicated by Yan et al. (1961)—even if their nomenclature was incorrect! Subspecies, by definition, do not overlap in distribution. A generic revision of *Tenodera* is much needed.

OGASAWARA: Matsumura (1906: 14, misnamed *T. capitata* Saussure, 1869, an African species); Shiraki (1911: 322–324, as *Paratenodera aridifolia sinensis*); Matsumura (1914: 118: as *T. aridifolia*; 1930: 207, as *Paratenodera aridifolia sinensis*; p. 224 notes it as *T. capitata* [reference to Matsumura, 1906, above]); Furukawa (1930: 227, 228); Hasegawa (1918: 14; no Latin name, equivalent of "large mantid" only).

KAZAN *Iwo-Jima*: Van Zwaluwenburg (1947: 18); Beier (1972: 173, 174, as *T. aridifolia sinensis*; *Iwo-Jima* erroneously listed as "Bonin [= Ogasawara] Is.").

#### Fam SIBYLLIDAE

Roy (1987) considered that this taxon, like the Orthoderidae, should be given full family status.

#### Subfamily SIBYLLINAE *Sibylla pretiosa* Stal, 1856

This African species is apparently a recent, deliberate introduction into Micronesia. It is not mentioned by Beier (1972).

MARIANA *Guam*: Kevan (1990: 112; based upon a specimen in the University of Guam insect collection).

## Isoptera

### SUBORDER TERMITODEA

By way of introduction to the termites of Micronesia, it may be of interest to note that, in the folklore of the indigenous peoples of the Caroline Islands, termites rendered valuable assistance to a mythological hero, Olifat (Poignant, 1967: 76; Siganos, 1985: 26–27).

So far as general Micronesian references to termites are concerned, Kevan (1987) cited a number of publications relating to species occurring on smaller southern Oceanian, particularly Micronesian, islands. References to Micronesia that cannot be incorporated under individual species will be found in a number of publications as indicated below.

Kuwana (1912: 365–368) mentioned termites from the Ogasawara Islands, but no Latin name was given. Bryan (1926a: 13) referred to an undetermined species from Wake Atoll. Ehrhorn (1939: 191) recorded a termite from Kosrae in the eastern Caroline Islands, but genus and species were undetermined. Esaki (1940b: 408) noted Kalotermitidae and Termitidae as being widely distributed in Micronesia, but neither species nor island was named. Townes (1946: 31), while he mentioned one species of termite by name (*Nasutitermes brevisrostris* Ōshima, 1917) as being the commonest species in Micronesia, gave only this general reference to the region; he only implied the presence of other species. Bryan (1948: 23, 42) gave general (as well as more specific) references to termites from Micronesia; on his p. 19, he referred in general terms specifically to Guam. Usinger & La Rivers (1953: 10, 12, 26, 28) mentioned termites generally for Arno Atoll in the Ratak Chain of the Marshall Islands; four species in as many genera were indicated, but none was named. Gressitt (1953a: 58, 60, 62, 64, 66, 69, 98, 102, 104, 152, 156) mentioned termites (or Isoptera) for the Palau Islands on numerous occasions without naming species, though elsewhere he named several, as will be indicated below under the appropriate species. Moul (1954: 13, 22) listed an undetermined termite for Onotoa Atoll in the Kiribati (Gilbert) Islands, and, in the same year, Gressitt (1954: 136, 145, 150, 151, 156, 161, 167) made references in general terms to Micronesian termites (his pp. 150 and 156 refer, respectively, to Arno and Onotoa Atolls—see above). He estimated that 18 species might occur in Micronesia, but, for the most part, no indication was given as to the islands or species involved.

More recently, some references to individual species were made by Bess (1970) and cited by Ernst & Araujo (1986), giving their distribution as the “Pacific islands,” without any indication of how extensively this was to be interpreted. Some such species are, in fact, not Micronesian. Examples of these include *Cryptotermes albipes* K. Holmgren and N. Holmgren, 1915 (Kalotermitidae, endemic to New Caledonia and the Loyalty Islands), *Schedorhinotermes medioscurus* N. Holmgren, 1913, *S. solomonensis* (Snyder, 1925), and *S. umbricatus* (Hill, 1927)

(Rhinotermitidae, from the Indo-Malayan region, the Solomon Islands and New Britain, respectively). B. Gray (1974: 46), who recorded various species of termites from the southern Pacific islands, in respect of Micronesia noted only that "Termites . . . attacked *Tectona grandis* trees at [sic] Ponape [= Pohnpei]". Ernst & Araujo (1986: 179, 713, 830, 860) mentioned Kalotermitidae, Rhinotermitidae and Termitidae generally from the "Pacific islands," with particular reference to Gay (1974), but without naming species or islands in this connection. Some of their implications do, however, relate to particular Micronesian species, as will be indicated under the appropriate taxa, below.

Fam. KALOTERMITIDAE  
Subfam. KALOTERMITINAE  
***Cryptotermes brevis*** (Walker, 1853)

Syn.: *Cryptotermes piceatus* Snyder, 1922

In his recent revision of the genus *Cryptotermes* Banks, 1906, Bacchus (1987) gave no record for this species from Micronesian or nearby islands, though such had been published. His reference to Ascension Island is definitely to the South Atlantic island and not to Pohnpei (see under *Diploptera punctata*, Blatodea, above).

MARSHALL (GENERAL): Ernst & Araujo (1986: 636, 731); Samuelson & Nishida (1987: 160; noted that the species is not yet known from Enewetak Atoll).

MARSHALL (RALIK) *Kwajalein*: Kwajalein I.: Sugerman (1972a: 276); Ernst & Araujo (1986: 460). Lib I.: Sugerman (1972b: 287); Ernst & Araujo (1986: 461).

[LINE *Fanning*: Snyder (1949: 39—seems to stem from a mistaken reading of Light, 1931: 588, where he discusses *C. piceatus* and mentions *C. hermsi* H. Kirby = *C. domesticus*, below, from Fanning I.]

***Cryptotermes domesticus*** (Haviland, 1898)

Syn.: *Calotermes kotoensis* Ôshima, 1912 [Bacchus (1987: 51) gave incorrect reference dated 1914].

*Calotermes (Cryptotermes) formosae* Holmgren, 1912.

*Calotermes (Cryptotermes) ogasawarensis* Ôshima, 1913 [Bacchus (1987: 51) misspelled the specific name as *ogasawarensis (sic)*].

*Cryptotermes hermsi* H. Kirby, 1925.

*Calotermes (Cryptotermes) buxtoni* Hill, 1926.

For further synonymy, see Snyder (1949) and Bacchus (1987).

Ernst & Araujo (1986: 638) referred to *C. domesticus* from the Pacific islands only in general terms, but Micronesia was inferred. Kevan (1990: 114) mentioned it from the latter, but without reference to any specific island or group.

OGASAWARA: Y. Nawa (1911: 423, figure [1], as "Ogasawara Shima shi-roari" [= Bonin Islands white ant] only); U. Nawa (1912: 440, pl. XXIII, upper

fig., as *Calotermes Kotoensis*); Ôshima (1913: 271, 274, 275, incl. figure 2; last as *Coptotermes* [sic, error for *Cryptotermes*] *ogasawarensis* n.sp.); 1914a: 291, 292, as *C. ogasawarensis* and *Calotermes (Cryptotermes) ogasawarensis* n.sp.; 1914b: 2, 4, 5, as last, incl. "n. sp." !); Hozawa (1915: 11, as *Calotermes kotoensis*; 51, 52, 53, figure 11, 54–57, 58, figure 12, 59, 60, figure 13, 61, pl. II, figure 9, 10, 61, as *Calotermes (Cryptotermes) kotoensis*, with various synonymy, including *formosae* Holmgren, 1911, *nomen nudum*, and *ogasawarensis* Ôshima; p. 56, subgenus misspelt *Gryptotermes* [sic]); Light (1924: 59, as "*Cr. kotoensis*"); Esaki (1930: 209, as *Calotermes (Cryptotermes) kotoensis*, synonymizing (*ogasawarensis* with it); Hozawa (1932: 2008, figure [2] A, B, as *Calotermes kotoensis*); Snyder (1949: 41; *ogasawarensis* given in synonymy though without reference to the Ogasawara [or Bonin] Islands); Bacchus (1987: 2, 3, 5, figure 2, 3, p. 9, 10, 14, figure 24, 25, p. 26, figure 80, p. 32, figure 108, p. 38, figure 125, p. 50–52, 85, figure 138, 140, p. 86, figure 141–143, p. 87, figure 144–146; p. 51 synonym misspelled as *agasawarensis* [sic].

MARIANA: Snyder (1940: 41); Bess (1970: 469, as *Cryptotermes* only). Guam: Swezey (1940: 177, as *C. hermsi*; 1941: 15, as *C. hermsi*); Hill (1942: 70, 71, figure 29, 72, as *Calotermes (Cryptotermes) buxtoni*); Light (1946: 9, as *C. hermsi*); Beller (1948: Pt. I: 5 = 8, as *C. hermsi*); Snyder (1949: 41); Gay (1967: 21; 1969: 465, 476); Ernst & Araujo (1986: 638, 681); Bacchus (1987: as under Ogasawara Islands, above, specifically p. 52).

[LINE *Fanning*: H. Kirby (1925: 437, 438, figure 1–12, 439–441, as *C. hermsi*, type locality); 1926a: 56, 57, 65, as *C. hermsi*; intestinal protozoa; 1926b: 103, 111, 114, 115, as last); Hill (1927: 13, as *C. hermsi*); Light (1931: 588, as *C. hermsi*; 1932a: 74, 84, as *Kalotermes (Cryptotermes) hermsi*); Light & Zimmerman (1936: 11, 12, as last); Hill (1942: 70, 71, figure 29, 72, as *Calotermes (Cryptotermes) buxtoni*); Light (1946: 9, as *C. hermsi*); Snyder (1949: 41); Gay (1967: 10, 20; 1969: 465); Ernst & Araujo (1986: 638, 668). *Washington*: Whitney (1929: 214, as *Kalotermes (Cryptotermes) hermsi*); Light (1946: 9, as *C. hermsi*).

The species also is recorded from Flint Island in the southernmost Line Islands, beyond the geographical range considered here: Light & Zimmerman (1936: 11, 12, as *Kalotermes (Cryptotermes) hermsi*); Hill (1942: 70, 71, figure 29, 72, as *Calotermes (Cryptotermes) buxtoni*); Light (1946: 9, as *C. hermsi*); Snyder (1949: 41); Gay (1969: 465); Ernst & Araujo (1986: 638, 671).]

### ***Cryptotermes dudleyi* Banks, 1918**

MARSHALL (GENERAL): Ernst & Araujo (1986: 639, 731).

MARSHALL (RATAK). *Arno*: Usinger & La Rivers (1953: 12, one of the four unnamed species); Gressitt (1984: 150, without name); Gay (1967: 11, 22; 1969: 65, 477).

KIRIBATI *Tarawa*: Bacchus (1987: 2, 3, 8, 9, 10, 14, figure 23, 22, figure 58, 59, 31, figure 105, 53, 54, 85, figure 138–140, 86, figure 141–143, 87, figure 144–146).

**Cryptotermes kororensis** Bacchus, 1987

PALAU *Koror*: Bacchus (1987: 2, tab. 2, p. 3, 5, figure 2 [map], p. 8, 9, 17, figure 37, 38, 27, figure 83, 36, figure 105, 61, 62 [also recorded as "Palau Islands" only], 85, figure 138–140, as *C. kororus* [sic], 86, figure 141–143, as *C. kororus* [sic]).

**Glyptotermes fuscus** (Ôshima, 1912)

OGASAWARA: Hozawa (1915: 11, 42, 43, 44, figure 9, 45–48, 49, figure 10, 50, 51, 56, pl. II, figure 7, 8; all but p. 11 as *Calotermes* (*Glyptotermes*)); Esaki (1930: 208, as *Calotermes* (*Glyptotermes*)); Hazawa (1932: 2009, figure [1] A, B, as *Calotermes*); Matsumura (1932: 63, 64, as *Calotermes*); Snyder (1949: 48).

**Glyptotermes** sp., ? **xantholabrum** (Hill, 1926)

Syn.: *Kalotermes* (*Glyptotermes*) *juddi* Light, 1932

*Glyptotermes xantholabrum* is a widespread species in the southern Pacific, including the Society and Marquesa Islands—see Light (1932b: 169, 170; 1932c: 172) and Snyder (1949:52)—but it has not been recorded by a specific name as occurring in Micronesia.

MARSHALL (GENERAL): Ernst & Araujo (1986: 678, 731, as *Glyptotermes* only); Samuelson and Nishida (1987: 160, as "? *Glyptotermes* [sp.]"); noted that it is not yet known from Enewetak Atoll.

MARSHALL (RALIK). *Kwajalein*: Roi-Namur I.: Sugerman (1972a: 276, as *Glyptotermes* sp.).

MARSHALL (RATAK). *Arno*: ? Usinger & La Rivers (1953: 12, ? one of the four unnamed termite species).

**Glyptotermes** sp.

Probably not same species as the last.

PALAU: Gressitt (1953a: 61, 98, 104, 152).

CAROLINE (GENERAL—could include Palau Is.): Bess (1970: 469).

**Incisitermes immigrans** (Snyder, 1922)

Syn.: *Calotermes* (*Calotermes*) *curvithorax* Kelsey, 1943

KIRIBATI (in error): Kurian et al. (1979A: 11; 1979B: 121; both as *Kalotermes*; both mistakenly based on a misreading of Johnston, 1965: 5).

[TUVALU (in error): Kurian et al. (1979A: 7; as *Kalotermes*; mistakenly based on a misreading of Johnston, 1965: 5; omitted by Kurian et al., 1979B).]

[PHOENIX *Canton*: Kelsey (1943: 45, 46, figure 1A-G, 47, 48, figure 2A-G, [49–51,] 52, figure 3A-F, [53]., as *Calotermes* (*Calotermes*) *curvithorax*, n. sp.); Van Zwaluwenburg (1948: 207, as *Calotermes curvithorax*); Snyder (1949: 16);

Dumbleton (1954: 50, 99, as *Calotermes*); Van Zwaluwenburg (1955: 3, as *Kalotermes*, also *Calotermes curvithorax* as synonym); Zimmerman (1957: 179, as *Kalotermes*; synonymy noted); Besa (1970: 471).]

[LINE: Zimmerman (1948: 169, as *Kalotermes*); Bess (1970: 469, as *Incisitermes* only, part, 471). *Fanning*: Light (1932a: 74, 75, figure 21, as *Kalotermes* (*Kalotermes*); 1935a: 236, 237, as *Kalotermes*); Light & Zimmerman (1936: 12, as *Kalotermes* (*Kalotermes*)); Gay (1967: 8; *Fanning* I. queried; 16; 1969: 462; *Fanning* I. queried; 471); Ernst & Araujo (1986: 695, 718). *Jarvis*: Whitney (1929, as *Kalotermes* (*Kalotermes*), only in timbers of wrecked schooner); Light (1932a: 74, 75, figure 21, as *Kalotermes* (*Kalotermes*); 1935a: 237, as *Kalotermes*); Light & Zimmerman (1936: 12, as *Kalotermes* (*Kalotermes*)); Lepesme (1947: 152, as *Calotermes* as being from Washington Island; misreading of Whitney, 1929, above); Snyder (1949: 16, as *Kalotermes*); Gay (1967: 8, 16; 1969: 462, 471); Bess (1970: 471); Ernst & Araujo (1986: 668, 695, 708). *Washington*: Light (1932a: 74, as *Kalotermes* (*Kalotermes*); possibly mistaken allusion to Whitney, 1929 [see *Jarvis* Island, above], who also recorded another species, as *K.* (*Cryptotermes*) *hermsi*, now *Cryptotermes domesticus*, q.v., from Washington Island); Light & Zimmerman (1936: 12, as *Kalotermes* (*Kalotermes*) ? as last); Lepesme (1947: 152, as *Calotermes*; erroneous, misreading of Whitney, 1929, referred to, for *Jarvis* Island, see above under that island and also the last two references).]

#### ***Incisitermes marianus* (N. Holmgren, 1912)**

Krishna (1961: 122), who erected the genus *Incisitermes*, was uncertain whether this species should be included or left in *Kalotermes*.

MARIANA: Holmgren (1912: 280, 281, 282, as *Calotermes*); Light (1946: 9, as *Calotermes*; not collected on Guam); Bryan (1948: 19, as *Calotermes*); Snyder (1949: 17, as *Kalotermes*); Bess (1970: 469, as *Incisitermes* only, part). *Guam*: Beller (1948: Pt. I: 5 = 8, as *Calotermes marianus* and also as *Calotermes* species); Snyder (1949: 17, as *Kalotermes*); Krishna (1961: 358, by implication; species listed on p. 122 as genus *Incisitermes* for Guam).

#### ***Incisitermes repandus* (Hill, 1926)**

MARSHALL (GENERAL): Samuelson & Nishida (1987: 160, as *Kalotermes*; noted as not yet known from Enewetak Atoll).

MARSHALL (RATAK). *Arno*: ? Usinger & La Rivers (1953: 12, as one of the four unnamed termite species). *Bikini*: Cole (1951: 247, as *Kalotermes*).

#### ***Neotermes connexus* (Snyder, 1922)**

Syn.: *Neotermes papua*; auctt., nec (Desneux, 1905)

MARIANA *Guam*: Swezey (1940: 171, 177; 1941: 15; both as *N. papua*); Hill (1942: 54, 55, as *Calotermes* (*Neotermes*) *papua*, part; reference to Swezey,

above); Light (1946: 9); Zimmerman (1948: 1); Beller (1948: Pt. I: 5 = 8, also as *N. papua*); Snyder (1949: 24); Bess (1970: 469, as *Neotermes* only).

[? TUVALU: Zimmerman (1948: 171; recorded with a query; probably referred in fact to *N. rainbowi* (Hill, 1926), below).]

***Neotermes kanehirai* (Ôshima, 1917) emend. nov.**

This species was originally described as *Calotermes (Neotermes) Kanehirae*, but the above emendation is called for to comply with the *International Code of Zoological Nomenclature*, Kanehira being a modern *male* patronym. The species has been recorded in general terms from Micronesia by Esaki (1940a: 279, as *Kalotermes*) and from the United States Trust Territory of the Pacific Islands (which could mean almost any island, except Guam, from the Line Islands westwards to the Mariana and Palau Islands) by Johnston (1969: 5), Owen (1971: 1) and Kurian et al. (1979A: 46; 1979B: 211; both misspelled *N. kanchirao* [sic]). Ernst & Araujo (1986: 358, [758, 778]) mentioned it from the Pacific islands only, but they cited Owen (1971).

PALAU: Ôshima (1917a: 1, 2, figure 1, 2, as "*Calotermes (Neotermes) Kanehirae* Nov. sp."; 1917b: 195, incl. figure 1, 196, as last, except for "nov."; 1942: 381[–382], 383, figure 1, as *Calotermes (Neotermes)*); Snyder (1949: 27; as "Caroline Isls.: Palao"); Gressitt (1953a: 98, 104, 153; also 61, 152, as *Neotermes* only). *Ngemelis*: Nghus (? = Ngis I., if not a locality on the previous island): Ôshima (1942: 381, as *Calotermes (Neotermes)*); Snyder (1949: 27). *Ngurektabel* (= Ngurukdabel): Ôshima (1942: 381, 384, figure 1 as *Calotermes (Neotermes)*); Snyder (1949: 27).

CAROLINE (GENERAL)—may all refer in fact to the Palau Is., cf. Snyder, 1949: 27, above): Bryan (1948: 23, as *Calotermes*); Krishna (1961: 325, by implication; species listed and generic distribution included Caroline Islands); Bess (1970: 469, as *Neotermes* only).

***Neotermes rainbowi* (Hill, 1926)**

Syn.: *Calotermes marginipennis*; nec (Hagen, 1858), *auctt.*

This species has been recorded from both Kiribati (Gilbert) and Tuvalu (Ellice) Islands, but all references to the former are in combination with the latter, so that only the Tuvalu Islands may be involved. Hill (1927: 5), though he previously (pp. 1, 2) had mentioned the species and its type locality gave no locality for "*Calotermes (Neotermes) rainbowi*" when comparing it with other species.

KIRIBATI (See reservations above): United Nations (1961: 2; 1962: 165; both as *Calotermes*); Johnston (1965: 5, as *Kalotermes*; jointly with Ellice [Tuvalu] Islands); Manser (1974: 7, 23, as *Neotermes* sp.; jointly with Ellice [Tuvalu] Islands); Kurian et al. (1979b: 121); Ernst & Araujo (1986: 147, 677, as *Neotermes* sp.).

[TUVALU: Hill (1926: 95, as "a rather large species of *Calotermes*"; noted that "*Calotermes marginipennis* Latreille" of Rainbow (1897) belonged to the present species); Hopkins (1928: 47, as *Calotermes*); Light & Zimmerman (1936: 4, 12, as *Kalotermes (Neotermes)*; synonymy with *connexus* (Snyder) and *samoanus*



(Holmgren) suggested); Hill (1942: : 5, as *Calotermes (Neotermes)*); Zimmerman (1948: 171, as *N. connexus* Snyder); Snyder (1949: 31); Dumbleton (1954: 51, 99, as *Calotermes*); United Nations (1961: 2; 1962: 165; both as *Calotermes*); Johnston (1965: 5, as *Calotermes*; jointly with Gilbert [Kiribati] Islands); Manser (1974: 7, 23, as *Neotermes* sp.; jointly with Gilbert [Kiribati] Islands); Kurian et al. (1979a: 7; 1979b: 113, referring to Hopkins, 1927, below, but omitting to cite his paper); Ernst & Araujo (1986: 659, 759; also 147, 677 as *Neotermes* sp.). *Funafuti*: Hedley (1896: 26—"the only insect foes to [coconut-]palm in Funafuti were the white ants . . .", species according to W.J. Rainbow, "*Calotermes marginipennis*, Latr.", see next); Rainbow (1897: 100, 101, as "*Calotermes marginipennis*, Latr.", see next); Rainbow (1897: 100, 101, as "*Calotermes marginipennis*, Latr." [nec Hagen, 1858, from "*Termes marginipenné*" Latreille, 1811]); Hedley et al. (1899: 520, as "*Calotermes marginipennis*, Latreille"); Hill, 1926: 95, 96, 97, figure 1A-F, 98, as *Calotermes (Neotermes)* and citing Rainbow, 1897; 1927: 1, 2 [reference inexact], and by Snyder, 1949: 31, who omitted to cite paper in references); Hill (1926: 85; 1942: 56; both as *Calotermes (Neotermes)*). *Nanomoga*: Hill (1926: as previously); Hopkins (1927: 26, p. II, figure 2, as *Calotermes*); Hill (1942: 56, as *Calotermes (Neotermes)*). *Nanumea*: Hill (1926: as above; type locality; 1942: 56, as *Calotermes (Neotermes)*). *Nui*: Hill (1926: as above; 1942: 56, as last). ? *Nukulailai Is.* Hill (1926: as above; 1942: 56, as last).]

[It may also be appropriate here to note another record of the species in the South Pacific, not too far removed from the region here considered, namely, the Danger Group, northern Cook Islands:

MANIHIKI *Suwarro*(w), or *Suvorov*, Atoll and I.: Kelsey (1945: 69, 70, figure 1, 71, figure 2, 74, figure 3, as *Calotermes (Neotermes)*); Lepesme (1947: 152, as *Calotermes Rainbowi*.)]

Fam. RHINOTERMITIDAE

Subfam. COPTOTERMITINAE

***Coptotermes formosanus* Shiraki, 1909**

Syn.: *Coptotermes intrudens* Ôshima, 1920

Harris (1971: 153) mentioned this species from the "Pacific islands" without being specific, though he gave Micronesian groups and islands on later pages, as indicated below.

MARIANA: Bess (1970: 469, as *Cryptotermes* only, part). *Guam*: Clagg (1958: 339); Harris (1961: 156, 160); Gay (1967: 13, 31; 1969: 468, 485); Hromada (1970: 11, 12, 16, 19, 20, 22, 24, 28); Harris (1971: 157); Ernst & Araujo (1986: 262, 601, 626).

MARSHALL (GENERAL): Harris (1961: 156, 160); Gay (1967: 13; 1969: 468); Harris (1971: 157) Ernst & Araujo (1986: 626); Samuelson & Nishida (1987: 160; noted that species not yet known from Enewetak Atoll).

MARSHALL (RALIK) *Kwajalein*: *Kwajalein I.*: Clagg (1958: 339); Gay (1967: 31; 1969: 485); Sugerman (1972a: 276); Ernst & Araujo (1986: 460).

MARSHALL (RATAK) *Arno*: Usinger & La Rivers (1953: 12; one of their four unnamed termite species).

[PHOENIX *Canton*: Degener & Degener (1974: 409, as *C. formosana*); Ernst & Araujo (1986: 129, 605, 626).]

### ***Coptotermes ? pacificus* Light, 1932**

Light (1932a: 84, 85, figure 25, 86) described this species from the Marquesa Islands, as indicated by Snyder (1949: 81). Bess (1970: 472) noted that it is "found in the South Pacific," but, like other (non-Micronesian) species, such as *C. amboinensis* Kemner, 1931, *C. dobonicus* Ôshima, 1914, *C. elisae* (Desneux, 1905) and *C. pamua* Snyder, 1925, similarly indicated by him, and by Ernst & Araujo (1986) as being from the "Pacific islands," there was no indication of which islands were relevant. There is no reliable evidence of *C. pacificus* having been found in Micronesia, but the following could conceivably refer to it, though it is more probable that the previous species was involved.

In all cases, unless otherwise indicated, the name used was *Coptotermes* only.

CAROLINE: Bess (1970: 469, part; presumably different from the Palau Islands species—see *C. remotus* Hill, 1927).

MARSHALL (GENERAL): Ernst & Araujo (1986: 621, 731, part).

MARSHALL (RALIK) *Kwajalein*: Kwajalein I.: Sugerman (1972a: 278, as *Coptotermes* sp., listed separately from *C. formosanus*, above) ; Ernst & Araujo (1986: 460).

### ***Coptotermes remotus* Hill, 1927**

Bess (1970: 472) mentioned this species as being "found in the South Pacific," which would include Micronesia, though he did not say so. Whether or not the one specific Micronesian reference to *C. remotus* (Gressitt, 1953a: 98) is based upon a reliable identification is uncertain.

PALAU: Gressitt (1953a: 98, 150; also 67 and 150 as *Coptotermes* only); ? Bess (1970: 469, as *Coptotermes* only, part; Palau Islands not distinguished from Caroline Islands proper).

### Subfam. RHINOTERMITINAE

### ***Prorhinotermes inopinatus* Silvestri, 1909**

Bess (1970: 472) indicated this species to be widely distributed among the islands of the South Pacific; this would include Micronesia, though he did not say so. Ernst and Araujo (1986: 806), citing Bess, also mentioned the species, even more vaguely, from the "Pacific islands".

MARIANA: Bess (1970: 469, as *Prorhinotermes* only, part). *Guam*: Swezey (1940: 171, 177; 1941: 5; both query identification); Hill (1942: 139); Light (1946: 9); Beller (1948: Pt. I: 5 = 8; ? also as "*Prorhinotermes* species"); Snyder (1949: 86); Clagg (1958: 339); Harris (1961: 156, 160; 1971: 153, 158).

MARSHALL (GENERAL): Ernst & Araujo (1986: 731, 805, as *Prorhinotermes* only); Samuelson & Nishida (1987: 160, as “? *Prorhinotermes* [sp.]”); noted that this is not yet known from Enewetak Atoll.

MARSHALL (RALIK) *Kwajalein*: Kwajalein I.: Sugerman (1972a: 276, as *Prorhinotermes* sp.); Ernst & Araujo (1986: 460, as *Prorhinotermes* sp.).

KIRIBATI *Onotoa*: ? Maul (1954: 13, 22, “unknown genus and species”).

[TUVALU: Hill (1926: 95; 1942: 138, 139); Snyder (1949: 86); Bess (1970: 469, as *Prorhinotermes* only, part).]

### ***Prorhinotermes ponapensis* (Ôshima, 1917)**

The original spelling of the specific name of this species as published by Ôshima (1917a) was as above. This paper, entirely in Japanese (except for Latin names) was not cited by Bryan (1948) or Snyder (1949). The English version (Ôshima, 1917b), which was cited by these authors, was simply a close translation of the original, which was published slightly earlier in the same year. The spelling “*ponapiensis*” by Ôshima (1917b: 196) was clearly a *lapsus calami*, for the correct spelling, “*ponapensis*,” was used twice on the next page. The *lapsus* probably resulted from the misspelling of the name of the type locality as “Ponapi”; in the original Japanese version this transliterates correctly as “Ponapé”! Since the original description of the species (Ôshima, 1917a) was not in one of the languages recognized as acceptable for the purposes of zoological nomenclature at the time, it could be argued that the name dates from Ôshima (1917b) rather than from the same author (1917a), but this does not affect the correct spelling of the name, which would then merely be a partial, valid emendation.

Light (1946: 9), misspelling the specific name as *panopiensis* [*sic*], queried the distinctness of the present species from *P. inopinatus*, Silvestri, 1909, above, which resulted in Snyder (1949: 86) listing the reference in the manner indicated below—when he also managed to misspell Light’s misspelling as “*ponopiensis*” [*sic*]!

PALAU: ? Gressitt (1953a: 69, 98, 155, as *Prorhinotermes* only).

CAROLINE (GENERAL, including Palau Islands): Light (1946: 9, as *P. panopiensis* [*sic*]; Bryan (1948: 23, as *Arrhenotermes* [*sic*] *ponapensis*); Snyder (1949: 86, as *P. inopinatus*, part: “? *Prorhinotermes ponopiensis* [*sic*] Light 1946, p. 9, Carolinas [*sic*]” !); Bess (1970: 469, as *Prorhinotermes* only, part).

E. CAROLINE *Kosrae*: ? Ehrhorn (1939: 191, as “gen. and sp. indet.”). *Pohnpei*: Ôshima (1917a: 3, 4, figure 1, 2, as “*Arhinotermes ponapensis* Nov. sp.”; 1917b: 196, as “*Arhinotermes ponapiensis* [*sic*] nov. sp.”, 197, incl. figure 2, spelling of specific name correct—see above); Snyder (1949: 87, as *P. ponapiensis* [*sic*]); ? B. Gray (1974: 46, as “Termites . . . attacked *Tectona grandis* trees . . .”)

### ***Schendorinotermes longirostris* (Brauer, 1865)**

This species was described from the Nikobar Islands and is known from Malacca and Sulawesi. The following Micronesian record could be a misidentification.

PALAU Koror: Ôshima (1942: 384, 385, figure 2, 386, figure 3, as *Rhinotermes* (*Schendorhinotermes*)).

Fam. TERMITIDAE  
Subfam. AMITERMITINAE  
**Microcerotermes biroi** (Desneux, 1905)

Syn.: *Microcerotermes peraffinis* Silvestri, 1909

This species is known from New Guinea, the Bismarck Archipelago, the Solomon Islands and Samoa (questionably also from New Zealand)—see Hill (1942: 423–426) and Snyder (1949: 134)—but there is no valid record of it from either Polynesia or Micronesia. Ernst & Araujo (1986: 736) referred to it only from the “Pacific islands,” which might have suggested that Micronesia was included, but they were citing Bess (1970), who mentioned the species only as being Papuan.

The reason for referring to *M. biroi* here is that, as *M. peraffinis*, it was listed by Kurian et al. (1979b: 113)—though not by Kurian et al. (1979a)—as occurring in the Ellice (Tuvalu) Islands, which, though not really part of Micronesia, have been associated with the Gilbert (Kiribati) Islands and are considered herein. These authors gave Hopkins (1927) as the source of their information, though they omitted to cite the paper in their list of references! Hopkins (1927), in fact, gave *M. peraffinis* for Samoa only—as did a subsequent review of his paper (Hopkins 1928). The above Tuvalu citation was clearly an editorial error.

Subfam. NASUTITERMITINAE  
**Nasutitermes brevirostris** (Ôshima, 1917)

Ôshima (1917a, b) described this species, as *Eutermes* (*Grallatotermes*) *brevirostris*, from both the Palau Islands and Pohnpei. These islands were originally (1917a) written (in Japanese, here transliterated) as “Perao” and “Ponapé”; in the English version (1917b) they are “Palau” and “Ponapi”. A single type locality was not indicated at the time of description or subsequently, so that the former (“Perao,” i.e., Palau Islands) is here selected as such in order to avoid possible confusion, should the eastern (Pohnpei) population prove to belong to a different species. The species was known earlier from Pohnpei (and elsewhere) as *Eutermes* sp., a pest of coconut palms (Prudhomme 1906, Zacher 1913).

Townes (1946: 31) stated that this species was the commonest termite in Micronesia, but he did not specify any particular island, mentioning the Caroline Islands in general terms, possibly implicating the Palau Islands. Oakley (1953: 180) also referred to the species as a pest of coconuts, naming several (but not all) of the relevant islands. Gressitt (1954: 179) mentioned it as occurring in Micronesia generally. That *N. brevirostris* is Micronesian was also implied when it was recorded from the United States Trust Territory of the Pacific Islands (this could mean almost any island, except Guam, from the Line Islands to the Palau

Islands) in the following publications: United Nations (1961: 2; 1962: 166); Johnston (1965: 5); Kurian et al. (1979a: 46, 1979b: 211). Bess (1970: 474) referred to this species only as "Papuan" (following Snyder's, 1949, terminology), though it is endemic to Micronesia. Ernst & Araujo (1986: 749), following him, gave *N. breviostris* for the Pacific islands, but without reference to any particular region.

PALAU: ? Schmeltz and Pöhl (1877: 19, as "*Eutermes* sp. ?"); Ôshima (1917a: 5-8, as "*Eutermes (Grallatotermes) breviostris* Nov. sp."; 1917b: 198, incl. figure 3, 199, figure 4, 200, as "*Eutermes (Grallatotermes) breviostris* nov. sp."; captions to figures as *Eutermes breviostris* only); Light & Wilson (1936: 476, for "Caroline Islands," part; citing previous reference and transferring to *Nasutitermes*); Esaki (1940b: 410, as *Eutermes*); Ôshima (1942: 381, 387, as *Eutermes (Grallatotermes)*); Snyder (1949: 269); Gressitt (1953a: 98, 104, 150; also 61, 65, 66, 67, 154, as *Nasutitermes* only); Oakley (1953: 180). *Ngurektabel* (= *Ngu-rukdabel*): Ôshima (1942: 387, as *Eutermes (Grallatotermes)*).

CAROLINE (GENERAL, ? including Palau Islands, above): Townes (1946: 31); Bryan (1948: 23, as *Eutermes*); Snyder (1949: 269); Dumbleton (1954: 51, 99); Bess (1970: 469, as *Nasutitermes* only, part).

W. CAROLINE *Ulithi*: Oakley (1953: 180). *Woleai*: Oakley (1953: 180). *Yap Gp.* Oakley (1953: 180).

C. CAROLINE *Chuuk*: Esaki (1940b: 410, as *Eutermes*); Potts (1949: 9, as *Nasutitermes* "presumably . . . *breviostris*" on all islands [i.e., islets], Moen I. specifically mentioned also); Oakley (1953: 180).

E. CAROLINE *Kosrae*: ? Ehrhorn (1939: 191, as "1 dealate termite," unnamed). *Pohnpei*: Prudhomme (1906), as *Eutermes* sp.); Zacher (1913: 114, as *Eutermes* sp.); Ôshima (1917a; 1917b; both as under Palau Is., above); Light & Wilson (1936: 476, for "Caroline Islands," part, as for Palau Islands, above; transferred to *Nasutitermes*); Esaki (1940b: 410, as *Eutermes*); Ôshima (1942: 387, as *Eutermes (Grallatotermes)*); Snyder (1949: 269).

MARSHALL (GENERAL): Samuelson & Nishida (1987: 160, as "? *Nasutitermes* [sp.]"; noted that not yet known from Enewetak Atoll).

### ***Nasutitermes palaoensis* (Ôshima, 1942)**

This species was listed by Bess (1970: 474) only as being "Papuan" [following Snyder's (1949) terminology] though it is endemic to Micronesia. Ernst and Araujo (1986: 754), citing him, gave the islands of the Pacific as the distribution of the species, without reference to region.

PALAU: ? Schmeltz & Pöhl (1877: 19, as "*Eutermes* sp.?" referred more probably to *N. breviostris*, above). *Koror*: Ôshima (1942: 387 [-388], as *Eutermes (Eutermes)*, 389, figure 5, passage on coconut tree bole, no subgenus); Snyder (1949: 392).

CAROLINE (GENERAL, but meaning Palau Islands): Snyder (1949: 392); Bess (1970: 469, as *Nasutitermes* only, part).

### Order Zoraptera

There appears to be no record of a zorapteran from Micronesia. Gressitt (1954: 136), however, estimated that two species might be expected to occur in the region. *Zorotypus swezeyi* Caudell, 1922, occurs in the Hawaiian Islands; *Z. buxtoni* Karny, 1932, in the Samoas; *Z. philippinensis* Gurney, 1938, in the Philippines; and *Z. zimmermani* Gurney, 1939, in Fiji (Gurney, 1938, 1939; Weidner, 1969, 1970).

### Order Embioptera

Esaki (1940b: 408) mistakenly stated that Embioptera "are apparently not represented in Micronesia." Gressitt (1954: 136, 160) estimated that four species might occur in the region, but he gave no indication of which species or islands could be involved. The same author (Gressitt, 1956b: 19) later noted that the order is poorly represented in the Pacific islands fauna, but, again, no species or island group was mentioned by way of illustrating the poorness of the representation. In the mean time, Ross (1955), in a paper not cited by Kevan (1987), published an account of five Micronesian species, one of them named only to genus. Samuelson & Nishida (1987: 160), referring to Ross (1955), also indicated that there were five known Micronesian species of the order; two of them were named and one was said to be new.

SUBORDER EMBIODEA  
Superfam. **OLIGOTOMOIDEA**  
Fam. OLIGOTOMIDAE  
Subfam. *OLIGOTOMINAE*  
***Aposthonia micronesiae*** (Ross, 1955)

*Aposthonia* Krauss, 1911, was formerly regarded as being a sugenus of *Oligotoma* Westwood, 1837, but Ross (1984) raised it to full generic status. The references given below are all to *Oligotoma (Aposthonia) micronesiae*, except as indicated.

MARIANA: Samuelson & Nishida (1987: 160). *N. Marianas* (general): Ross (1955: 2, 6). *Anatahan*: Ross (1955: 3, 5).

CAROLINE (GENERAL): Samuelson & Nishida (1987: 160).

MARSHALL (GENERAL): Ross (1955: 2); Samuelson & Nishida (1987: 160); noted that the species is not yet known from Enewetak Atoll.

MARSHALL (RALIK). *Jaluit*: Ross (1955: 5; Elizabeth I.); Samuelson & Nishida (1987: 160).

KIRIBATI: Ross (1955: 2, 4; figure 1a-g, 6); Manser (1974: 12, as *Oligotoma micronesiae*; jointly with Ellice [Tuvalu] Islands). *Butaritari*: Ross (1955: 5; Makiu I.); Samuelson & Nishida (1987: 160).

[TUVALU: Manser (1974: 12, as *Oligotoma micronesiae*; jointly with Gilbert [Kiribati] Islands).]

**Aposthonia oceanica** (Ross, 1951, *emend.* Samuelson and Nishida, 1987)

The original spelling of the specific name was "*oceania*," which does not seem to have been a *lapsus calami* or typographical error as it was repeated by its author subsequently. Nevertheless, according to the *International Code of Zoological Nomenclature*, it is unacceptably formed, for it is neither an adjective nor a noun in apposition (nor a random sequence of letters). The emendation made by Samuelson & Nishida (1987: 160) is acceptable, even though it may have been inadvertent!

Ross (1984), when he raised *Aposthonia* to full generic status, gave a wide Pacific range for this species, but he did not refer specifically to Micronesia.

The references given below are all to *Oligotoma (Aposthonia) oceanica* [*sic*] unless otherwise indicated.

CAROLINE (GENERAL): Samuelson & Nishida (1987: 160, as *O. (A.) oceanica*).

E. CAROLINE *Kosrae*: Ross (1955: 2, 3, 4, figure 1h-j; p. 3 gave Lele or Lelu I). [LINE *Fanning*: Ross (1951: 307, 308; 1955: 3); Zimmerman (1957: 179).]

**Aposthonia** sp. (? nov.)

E. CAROLINE *Pohnpei*: Ross (1955: 2, as *Oligotoma (Aposthonia)* sp.); 6, as *Oligotoma* sp.); Samuelson & Nishida (1987: 160, as an undescribed *Oligotoma (Aposthonia)*).

**Oligotoma humberiana** (Saussure, 1896)

Samuelson & Nishida (1987: 160) stated that two Asiatic species of Embioptera (which they did not name) were known from Micronesia. This is one of them.

MARIANA S. *Marianas* (general): Ross (1955: 2, 6, 8, in subgenus *Oligotoma*; 6, 8 also without subgenus). *Guam*: Ross (1951: 307; 1955: 6, in subgenus *Oligotoma*). *Saipan*: Ross (1955: 6, as last). *Tinian*: Ross (1951: 307; 1955: 6, as before).

**Oligotoma saundersii** (Westwood, 1837)

The introductory remarks to the previous species apply to *O. saundersii* also. Ross (1955: 8) considered that this was likely to become widely distributed in Micronesia generally, though he recorded it only as indicated below.

MARCUS: Sakagami (1953: 26, as *O. saundersi*); Ross (1955: 2, 7, figure 2, 8, as subgenus *Oligotoma*; 8 also without subgenus).

[PHOENIX *Canton*: Van Zwaluwenburg (1943: 305; 1955: 10); Ross (1955: 8, as subgenus *Oligotoma*).]

**Order Dermaptera**

Brindle (1972) "monographed" the Dermaptera of Micronesia and listed all species known from the region, some being described as new. Nevertheless, he

omitted to cite the majority of previous publications relating to Micronesian earwigs.

An early general reference is that of Kempny *in* Schnee (1904: 409), who recorded a "Kl[eine] Forficulinen-Art . . . sp.?" from the "Marschall" [*sic*] Islands—the spelling being that incorrectly adopted by the Germans during their occupation of the islands (*ca.* 1888 until World War I); the islands were named after a British sea-captain, Marshall! Considerably later, Esaki (1940b: 408) mentioned that "Forficulidae" (i.e., Dermaptera) were widely distributed in Micronesia. Van Zwaluwenburg (1943: 305) referred to an undetermined species of earwig imported into Canton Island (Phoenix Islands to the east of Micronesia) from the "Pacific coast" (meaning, one must presume, that of the United States of America); it apparently did not become established.

Townes (1946: 31) referred to three undetermined species of "Labiidae" (Spongiphoridae): one each from the Palau Islands (Peleliu) the central Caroline Islands (Chuuk Atoll) and the Eastern Caroline Islands (Pohnpei). He also mentioned an unnamed anisolabidine from the last locality. Bryan (1948: 6, 30, 42) gave several general references to Micronesian earwigs as well as some more specific ones, particularly from Guam. Gressitt (1953a: 52, 65, 66, 68, 98, 103, 104, 151) mentioned the occurrence of Dermaptera (or of earwigs) in general terms for the Palau Islands; he also referred to particular species, as indicated appropriately hereafter. Usinger & La Rivers (1953: 8, 20, 24, 27) mentioned earwigs for Arno Atoll (Ratak Chain, Marshall Islands), but no species was named. Gressitt (1954: 136, 148 and 150 [Arno Atoll], 156, 160, 161, 165, 168) also referred to Dermaptera (or to earwigs) in Micronesia and estimated that 22 species might occur there; 24 were listed by Brindle (1972). For Kapingamarangi Atoll in the southeastern Caroline Islands, Niering (1963: 155) mentioned earwigs, but no species was identified. Steinmann (1979) listed a number of species of Spongiphoridae (as Labiidae) as being distributed in Oceania, but, apart from the Hawaiian Islands, no particular region was indicated; the Micronesian species were not distinguished as such. Samuelson & Nishida (1987: 160) indicated that seven species of Dermaptera are known for the Marshall Islands, six of them from Kwajalein Atoll. Only three of these were said to occur in the Caroline Islands also, but no indication was given as to which these were or whether they were the same species as were named from Enewetak Atoll in the Marshall Islands (Ralik Chain).

SUBORDER FORFICULOIDEA (= FORFICULINA)

Superfam. ANISOLABIDOIDEA

Fam. ANISOLABIDIDAE (= CARCINOPHORIDAE *auctt.*)

Subfam. GONOLABIDINAE

**Gonolabis insulana** Brindle, 1972

This species was listed by Steinmann (1978: 184) only as being Oceanic.

CAROLINE (GENERAL): Sakai (1987: 1902, 2456, figure 5 [of Brindle, 1972]); Steinmann (1988: 189, 223, 224, figure 368, 369; 1989b: 289).



W. CAROLINE *Yap Gp.* East Rumung I.: Brindle (1972: 119, 120, figure 5; type locality; repeated by Sakai, 1987: 1903). Yap. I.: Townes (1946: 31, as “a *Gonolabis*”); Brindle (1972: as above).

E. CAROLINE *Pohnpei*: Brindle (1972: as above); Sakai (1982: 26).

Subfam. *ANISOLABIDINAE* (= *CARCINOPHORINAE*, auctt.)

***Anisolabis maritima*** (Borelli in Gén , 1832)

Steinmann (1978: 183) included Oceania in the distribution of this species, but without details. The same author later (Steinmann 1989b) again made no reference to Micronesia in giving the distribution of the species, though relevant literature was cited. Kevan (1990: 112) noted that *A. maritima* occurs in Micronesia, but no specific island or group was mentioned.

[JOHNSTON: Bryan (1926a: 13); Hebard (1926: 82); Rehn (1949a: 165).]

WAKE Wake I.: Bryan (1926a: 13); Hebard (1926: 82); Rehn (1949a: 165).

OGASAWARA: Shiraki (1928: 8); Esaki (1930: 208); Furukawa (1930: 230); Kat  (1932: pl. 1, figure 2); Matsumura (1933: pl. 6, figure 20; 1935: 1384, figure [2]); Hirayama (1937: pl. 98, figure 7); Kat  (1938: 15). *Chichi-Jima*: Furukawa (1930: 230); Esaki (1930: 208); Brindle (1972: 123, figure 6d, 128, 129, figure 7a).

MARCUS: Sakagami (1953: 26).

CAROLINE (GENERAL): Brindle (1972: as above; really refers to next).

W. CAROLINE *Ulithi*: Mog Mog. I.: Rehn (1949a: 165).

E. CAROLINE *Pohnpei*: Townes (1946: 31, as “another anisolabine,” but possibly not this species because habitat mountainous).

MARSHALL (RALIK) *Jaluit* and *Kwajalein*: Brindle (1972: as above).

***Anisolabis minutissima*** Brindle, 1972

Steinmann (1978: 183) indicated Oceania only for the distribution of this species.

PALAU: Steinmann (1979a: 68, as Palau Island); Sakai (1982: 28, as *Anisolabis (Anisolabis)* and as West Caroline Islands); Steinmann (1984: 78); Sakai (1987: 2121, reprint of Brindle, 1972, below; 2564, figure 6, 7 [of Brindle, 1972, below]; as West Carolines); Steinmann (1988: 71, 133, 134, figure 216, 217; 1989b: 224; as “Palau Island” and “West Caroline Islands”). *Peleliu*: Brindle (1972: 123, figure 6a–c, 128, 129, incl. figure 7b, 130; type locality); Sakai (1987: 2121–2122; repeated from Brindle, 1972).

***Euborellia annulata*** (Fabricius, 1793)

Syn.: *Forcinella St li* Dohrn, 1864 = *Euborellia staali* (Dohrn, 1864).

*Paralabella annulata* (Fabricius, 1793); Steinmann, 1989.

*E. annulata*, as "*E. stali*" (*sic*), was listed for Micronesia by Sakai (1982: 25), who placed it in subgenus *Euborellia*, *s. str.* no particular island or group was indicated.

In the following citations, the name is given (and misspelt) as *Euborellia stali* unless stated otherwise.

WAKE *Wake I.*: Brindle (1972: 122, 123, 124, figure 6f, 129, figure 7d).

OGASAWARA *Chichi-Jima*: Brindle (1972: as above).

MARIANA *Guam*: Townes (1946: 31); Rehn (1949c: 109, as *E. plebeja*, *nec* (Dohrn, 1863)); Brindle (1972: as above). *Rota*: Brindle (1972: as above). *Saipan*: Townes (1946: 31); Rehn (1949c: 109, as above); Brindle (1972: as above). *Tinian*: Townes (1946: 31); Brindle (1972: as above).

PALAU: Furukawa (1948: 176, as *E. stali*). *Angaur* and *Babeldoab*: Brindle (1972: as above). *Koror*: Shiraki (1928: 6, 7, figure 3, as *E. stali*, from "Korol-Pelau").

W. CAROLINE *Yap Gp. Yap I.*: Brindle (1972: as above).

C. CAROLINE *Chuuk*: Moen I.: Brindle (1972: as above).

E. CAROLINE *Pohnpei*: Brindle (1972: as above).

MARSHALL (RALIK). *Kwajalein*: Brindle (1972: as above).

KIRIBATI *Tarawa*: Brindle (1972: as above).

### *Euborellia annulipes* (Lucas, 1847)

Syn.: *Anisolabis fallax* Shiraki, 1905

*Anisolabis picea* Shiraki, 1905

The earliest name for this species seems to be *Forficula equestris* Gén , 1837, according to Steinmann (1989b: 262). That author gave neither previous synonymy nor any reason for retaining the junior name *annulipes*; *F. equestris* does not appear to be a preoccupied name, so it should presumably be treated as a *nomen oblitum* in order to conserve the well-known name. Steinmann (1989b: 263) also indicated *Anisolabis fallax* Shiraki, 1905, to be a new synonym of *E. annulipes*, but this had already been established by Shiraki (1928:8) under *Anisolabis*, as indicated by Sakai (1970a: 36; though left as a separate species, p. 63). With reference to *Anisolabis piceus* Shiraki, 1905, Steinmann (1989b: 229), emending the spelling to *picea*, indicated that it was a synonym of *A. maritima* (Bonelli, 1832) and that Shiraki's (1906) use of the species name referred to *E. annulipes*, but he did not give the latter synonymy in its proper place at the top of his p. 263, though he gave the former on his p. 222. Shiraki's own (1928: 8) synonymy of "*piceus*" with *annulipes* seems not to have been covered.

Steinmann (1978: 185) indicated Oceania as being included in the distributional range of *E. annulipes*, but he made no mention of Micronesia. Kevan (1990: 112) did, however, note that the species was found in Micronesia, though no island or group was mentioned.

[JOHNSTON: Bryan (1926a: 13); Hebard (1926: 83).]

WAKE Wake I.: Brindle (1972: 112, figure 3b, 123, figure 6a, 125, 129, figure 7c).

OGASAWARA: Shiraki (1905: 94, 96, pl. III, figure 4, as *Anisolabis fallax*; 94, 95, 96, as *A. piceus*, also misspelled "*piseus*" on p. 96); Matsumura (1914: 118, as *Anisolabis ballas* [sic] for *fallax*); Shiraki (1928: 8, as *Anisolabis*; also *A. fallax* and *A. piceus*, as synonyms); Esaki (1930: 208, as *Anisolabis*, with synonyms *A. fallax* and *A. piceus* as *piccus* [sic]); Furukawa (1930: 230, as *Anisolabis*); Shiraki (1932: 2027, figure [2], as *Anisolabis*); Katô (1938: 15, as *Anisolabis*); Shiraki (1950: 72, figure 171, as *Anisolabis*); Sakai (1970a: 36). *Chichi-Jima*: Furukawa (1930: 230, as *Anisolabis*); Sakai (1970a: 36); Brindle (1972: as above). *Haha-Jima*: Brindle (1972: as above).

KAZAN *Iwo-Jima*: Brindle (1972: as above).

MARCUS: Sakagami (1953: 26).

MARIANA *Guam*: Swezey (1946: 8); Beller (1948: Pt. I: 5 = 8); Rehn (1949a: 165, 166, as *Anisolabis*); Sakai (1970a: 36); Brindle (1972: as above). *Saipan* and *Tinian*: Brindle (1972: as above).

PALAU: ? Gressitt (1953a: 98, 151, as *Euborellia* sp.). *Koror* and *Peleliu*: Brindle (1972: as above).

W. CAROLINE *Yap*. *Gp.*: Yap I.: Brindle (1972: as above).

C. CAROLINE *Chuuk*: Townes (1946: 31). Moen I.: Brindle (1972: as above).

E. CAROLINE *Pohnpei*: Townes (1946: 31).

MARSHALL (RALIK) *Enewetak*: Townes (1946: 31); Rehn (1949a: 165, 166, as *Anisolabis*, Enewetak I.); Brindle (1972: as above); Samuelson and Nishida (1987: 149, 170, latter p. for Enewetak I. and Enjebi I.). *Kwajalein*: Brindle (1972: as above).

KIRIBATI *Tarawa*: Brindle (1972: as above).

OCEAN GP. *Nauru*: Froggatt (1910: 408, as *Anisolabis*).

[PHOENIX *Canton*: ? Van Zwaluwenburg (1943: 305, as "Undet. sp.")]

[LINE *Palmyra*: Swezey (1914: 16, as *Anisolabis*); Hebard (1926: 83); Hincks (1938: 302, as *Anisolabis*); Rehn (1949a: 165, 166; 1949b: 98; both as *Anisolabis*); Krauss (1953: 218).]

### ***Euborellia eteronoma* (Borelli, 1809)**

The Oceanian distribution of this species was given by Steinmann (1978: 183), in the genus *Anisolabis* Fieber, 1853, only as the Hawaiian Islands. It was transferred to *Euborellia* by the same author only quite recently (Steinmann, 1988: 271).

MARSHALL (RALIK) *Ailiglalalap*: Jabwot (or Jabvat) I. and Jaluit I.: Ehrhorn (1939: 191, as *Anisolabis*).

[PHOENIX *Canton*: Van Zwaluwenburg (1943: 305, as *Anisolabis*, ex Hawaiian Islands, ? not established; 1955: 3, as last).]

**Euborellia femoralis** (Dohrn, 1863)

Syn.: *Euborellia plebeja* (Dohrn, 1863)

The above synonymy was given by Brindle (1972: 126), but apparently not accepted (or it was missed) by Steinmann (1978: 185, 186), who recorded it also as *E. plebeja* for Oceania, by Sakai (1982: 25), who assigned *femoralis* to the subgenus *Euborellia*, s. str. and by Steinmann (1989b: 275, 276). Neither author gave a Micronesian distribution. Steinmann (1988: 238, 267, figure 438, 439), however, had noted it for Micronesia (p. 267), though *E. plebeja*, regarded as a distinct species (pp. 259–261), was not so recorded.

PALAU *Babeldoab*: Brindle (1972: 126).

Subfam. *ANTISOLABIDINAE* (= *ANTISOLABINAE*, auctt.)

**Antisolabis greensladei** (Brindle, 1970)

Syn.: *Brachylabis greensladei* Brindle, 1970

Steinmann (1978: 187) gave the distribution of this species as Oceanian only; he misspelled the name “*greenslandei*”.

PALAU: Steinmann (1988: 341, 359, 360, figure 576, 577; 1989b: 323; “distribution” given only as Solomon Islands, but “Palau” included in author’s own 1988 citation, *antea!*). *Babeldaob* and *Garakayo*: Brindle (1972: 131, figure 8, 132, as *Brachylabis*).

Fam. LABIDURIDAE

Subfam. *LABIDURINAE*

**Labidura riparia** (Pallas, 1773)

WAKE Wake I.: Brindle (1972: 132, 133, figure 9, 134).

MARCUS: Sakagami (1953: 26, as *Labidura* sp.).

MARIANA *Saipan*: Brindle (1972: as above).

PALAU *Angaur* and *Peleliu*: Brindle (1972: as above).

CAROLINE (GENERAL): Townes (1946: 31).

C. CAROLINE *Chuuk*: Townes (1946: 31). Moen I. and Tol I.: Brindle (1972: as above).

E. CAROLINE *Pohnpei*: Brindle (1972: as above).

MARSHALL (GENERAL): Townes (1946: 31); Samuelson & Nishida (1987: 170: as “? islet”).

MARSHALL (RALIK) *Enewetak*: Townes (1946: 31); Rehn (1949a: 166, *Enewetak* I.); Brindle (1972: as above); Samuelson & Nishida (1987: 149, 170; latter p. for *Enewetak* I. and *Enjebi* I.). *Jaluit*: Brindle (1972: as above). *Kwajalein*: *Kwajalein* I.: Townes (1946: 31); Sugerman (1972a: 275); Brindle (1972: as above).

MARSHALL (RATAK) *Majuro*: Townes (1946: 31).

[LINE *Kiritimati*: Krauss (1953: 218).]

Superfam. **FORFICULOIDEA**  
 Fam. SPONGIPHORIDAE (= LABIIDAE, *auctt.*)  
 Subfam. *NESOGASTRINAE*  
**Nesogaster aculeatus** (Bormans, 1900)

Syn.: *Nesogaster reditus* Rehn, 1946

Steinmann (1979b: 276, 277) noted that this species (under both names) has an Oceanian distribution. The same author (Steinmann 1989a: 23, 24, figure 26–28; 1989b: 402, 403) synonymized *reditus* under *aculeatus*. In the earlier reference, the Caroline Islands were mentioned (p. 23), as was Micronesia (p. 24); the type of *N. reditus* was noted (p. 23) as being from Guam. In the later (1989b) reference to the species, he stated it to be “widely distributed from the Philippine Islands to Micronesia”, but, of the latter, only Guam was specifically mentioned (p. 402). Sakai (1991: 3339 [=123], 3350 [=133]) lists this species as *Nesogaster (sic) aculeata (sic)* from Micronesia; on other pages he is more specific; he does not synonymize the two names.

MARIANA: Popham & Brindle (1967: 36, as *N. reditus*); Sakai (1970b: 19, as *N. reditus*); Brindle (1971: 118, as *N. reditus*); Steinmann (1976: 403, as *N. reditus*); Sakai [reprinting Brindle, 1971, 1972] (1991: 3350 [=133], as *N. reditus*); Sakai [not reprint] (1991: 3377, 3765, figure, 3767, figure [“Marianne Is.” displaced], 3821, with various figs from Rehn, 1946, Brindle, 1971, and original, as *N. reditus*). Guam: Rehn (1946: 221, figure 6, 7, 226–231, as *N. reditus*; type locality; 1949c: 110, as *N. reditus*); Brindle (1971: 115, 116, figure 7, [118,] 124, as *N. reditus*; 1972: 114, figure 4a, 136, figure 10e, f, h, 140, 141, 159, figure 16f, also as *N. reditus*); Steinmann (1989a: 23, for *N. reditus*, as synonym; 1989b: 402, for *N. reditus*, as synonym, 403); Sakai [reprinting Brindle, 1971, 1972] (1991: 3350 [=133]; also 3381, 3382, as *N. reditus*); Sakai [reprinting Rehn, 1946] (1991: 3378[–3381], as *N. reditus*). Tinian: Brindle (1972: as above).

PALAU: ? Schmeltz & Pöhl (1869: 32, as *Haania minor* Br[unner von Wattenwyl], *nomen nudum*); Gressitt (1953a: 98, as *Nesogaster* sp.). Babelthuap, Garakayo, Koror and Peleliu: Brindle (1972: as above); Sakai [reprinting last] (1991: 3350 [=133]).

Note: The reference by Schmeltz & Pöhl (1869) lists “*Haania minor*” between “*Pyrgomorpha crenulata* F.” (actually *Atractomorpha australis* Rehn) and “*Lobophora* [?] *Chelisoche* morio F.”, i.e., between the end of the Acridoidea (in modern parlance) and the recognizable Dermaptera; other orthopteroids were all dealt with on a previous page, so that this “*Haania*” was undoubtedly an earwig. There can be no association with the genus *Haania* of Stål (Mantodea), which was not described until 1871.

CAROLINE (GENERAL, ? including the Palau Islands): Burr (1912: 320); Borelli (1928: 4, var. *brevipennis*); Hincks (1938: 308); Rehn (1946: 419, as *Neogaster* only); Bryan (1948: 5, var. *brevipennis*, 15); Brindle (1971: [116, incl. fig. 1, no ref. to Micronesia,] 118, 119; 1972: 140); Steinmann (1989a: 23, 24, fig.

26–28); Sakai [reprinting Brindle, 1971, 1972] (1991: 3347 [=130], 3350 [=133], 3352 [=135], incl. fig. 10 e, f, h [last fig. as *N. redivus*]).

W. CAROLINE *Yap Gp.* Yap I. : Brindle (1972: as above); Sakai [reprinting last] (1991: 3350 [=133]).

E. CAROLINE *Kosrae*: Menozzi (1941: 80); Brindle (1972: as above); Sakai [reprinting last] (1991: 3351 [=134]); Sakai [not reprint] (1991: 3767, figs, as *N. redivus*). *Pohnpei*: Menozzi (1941: 80); Brindle (1972: as above; including Nanua I.); Sakai [reprinting last] (1991: 3350 [=133]).

#### Subfam. SPARATTINAE

##### *Auchenomus javanus* (Bormans, 1883)

Steinmann (1979b: 280) mentioned this species as having an Oceanian distribution, but he was no more specific.

PALAU *Babeldoab*: Brindle (1972: 142, 143, 159, fig. 16e, 161, fig. 17a, f); Sakai [reprinting Brindle, 1972] (1991: 3622).

#### Subfam. LABIINAE

##### *Chaetolabia appendicina* (Menozzi, 1941)

Bryan (1948: 21) noted that Menozzi (1941) had described *Labia appendicina* from Micronesia, but he did not indicate a more precise locality. Steinmann (1976: 417) also mentioned the species in general terms as being Micronesian; later (Steinmann, 1979b: 297), he merely stated it to be Oceanian. Sakai (1982: 41) also mentioned the species (as *Chaetolabia*) for Micronesia.

CAROLINE (GENERAL): Steinmann (1989b: 563, as “Carolinas [*sic*] Islands”).

C. CAROLINE *Chuuk*: Fefan I.: Menozzi (1941: 75, 76, 77, fig. 2, as *Labia*); Brindle (1972: 150, 151, fig. 14d-f, 153). Mesa [? = Mesegan] I.: Menozzi (1941: as above).

E. CAROLINE *Pohnpei*: Menozzi (1941: as above; type locality); Brindle (1972: as above); Steinmann (1979b: 297); Sakai (1982: 41); Steinmann (1989a: 525, 540, fig. 1012–1014, 541; 1989b: 563).

Note: Steinmann (1989b: 563) actually designated the type locality of this species as Pohnpei. As Menozzi (1941) did not indicate a lotype, his male from Nigit-Rontiki is here designated lectotype.

##### *Chaetolabia esakii* (Menozzi, 1941)

Syn.: *Labia dubronyi*; Menozzi, 1941, *nec* Hebard, 1922

Bryan (1948: 21) noted that Menozzi (1941, below) had described *Labia esakii* from Micronesia, but he was no more precise. Rehn (1949b: 104), on the basis of a record from Pohnpei by Menozzi (1941, below) and using the name *Labia* [now *Spirolabia*] *dubronyi* Hebard, 1922, said that the species is “probably . . . of relatively broad distribution in Polynesia and Micronesia”. Sakai (1970a:

151, 152) also accepted *dubronyi* as Micronesian, but Brindle (1972), who erected the genus *Chaetolabia*, indicated that Menozzi's (1941)—but not Rehn's (1949b)—use of the name *dubronyi* was incorrect for Micronesia.

Steinmann (1976: 417, fig. 68) listed *C. esakii* for Micronesia; later (Steinmann, 1979b: 297), he indicated that it was Oceanian (on his p. 291 he gave *Labia dubronyi* for the same region). Sakai (1982: 41) listed the species for Micronesia. Steinmann (1985: 122) made no reference to its apparently exclusively Micronesian distribution, merely noting it as being an "Indo-Australian" species.

E. CAROLINE *Kosrae*: Menozzi (1941: 74, 75, fig. 2, as *Labia*; type locality—no holotype was designated; his male "Kusaie" specimen from Malem is here designated lectotype); Brindle (1972: 150, 151, fig. 14a-c, 159, fig. 16b); Steinmann (1989a: 525, 539, fig. 1009–1011, 540; *dubronyi* as synonym; 1989b: 565). *Pohnpei*: Menozzi (1941: 74, as *Labia dubronyi*); Rehn (1949b: 104, as last); Sakai (1970: 152); Brindle (1972, as above); Steinmann (1989a: as above).

#### ***Chaetolabia spicata* Brindle, 1972**

Steinmann (1976: 417) listed this species, as *C. apicata* (*sic*), from Micronesia, but without specific indication of island or group. The same author (Steinmann, 1979b: 297) indicated the species as being Oceanian only, and later (Steinmann, 1985: 122) as merely being "Indo-Australian". Sakai (1982: 41) listed it as Micronesian, but no more precisely.

PALAU: Steinmann (1989a: 525, 537, fig. 1004, 1005; 1989b: 566, 567). *Peleliu*: Brindle (1972: 150, 151, fig. 14g, h, 153; type locality).

#### ***Chaetospania fuscata* Brindle, 1972**

There are three Micronesian subspecies of this apparently endemic earwig genus. Steinmann (1976: 417) listed all three for Micronesia generally, without separating them geographically. The same author (Steinmann 1979b: 296) later listed *C. fuscata* [*fuscata*] and the two other subspecies as having an Oceanian and (erroneously) a Malaysian distribution. Sakai (1982: 40) gave the species and two of the subspecies as Micronesian, but he omitted the nominotypical subspecies and the distinguishing geographic distributions. Steinmann (1989a: 176, 204) mentioned *C. fuscata*, *s. lat.*, from the Caroline Islands, including Kosrae, the type locality of the nominotypical subspecies. Sakai (1991: 3719–3720, 3787, 3912) gave *C. fuscata*, *s. l.*, and the various subspecies from Micronesia generally.

#### ***Chaetospania fuscata clavata* Brindle, 1972**

MARIANA *Guam*: Brindle (1972: 144, 147, fig. 13e, f, j, 148; type locality); Steinmann (1989a: 205, 206, fig. 350, 351; 1989b: 465); Sakai (1991: 3720 [reprinting from Brindle, 1972] 3787, 3 figs. with locality omitted, 3789, fig., 3912, with reprints of Brindle, 1972, & original figs.).

**Chaetospania fuscata fuscata** Brindle, 1972

CAROLINE (GENERAL): Steinmann (1989a: 206; 1989b: 465).

E. CAROLINE *Kosrae*: Brindle (1972: 145, 146 [trinomen not used above description!], 147, fig. 13c, d, k, 148; type locality); Steinmann (1989a: 205, fig. 348, 349; 1989b: 465); Sakai (1991: [3719–]3720 [reprinting from Brindle, 1972], 3787, figs. no subspecific name, Micronesia only, 3789, fig., 11 [with figs. from Brindle, 1972], 3912, incl. fig.

**Chaetospania fuscata yapensis** Brindle, 1972

CAROLINE (GENERAL): Steinmann (1989a: 205, 206, 207, fig. 352, 353; 1989b: 465).

W. CAROLINE *Yap Gp.*: Brindle (1972: 145, 147, fig. 13a, b, 148, 149; type locality); Steinmann (1989a: 206; 1989b: 465); Sakai (1991: [3720–]3721 [reprint from Brindle, 1972], 3789, fig., 3912, as Micronesia only [incl. fig. from Brindle, 1972], 3913, fig.).

**Chaetospania nigrigula** Brindle, 1972

Steinmann (1976: 417) listed this species for Micronesia, but without more precise locality. The same author later (Steinmann, 1979b: 297) merely indicated the distribution as being Oceanian. Sakai (1982: 40) gave Micronesia only.

PALAU: Steinmann (1989a: 177, 213, 214, fig. 365–367; 1989b: 471); Sakai (1991: 3913 [incl. figs from Brindle, 1972, and Steinmann, 1979], also original fig.). *Garakayo*: Brindle (1972: 144, 145, 146, fig. 12c, e; type locality Ngergoi); Sakai (1991: [3721–]3722 [reprint of last], 3787, fig., no locality).

**Chaetospania ponapensis** Brindle, 1972

Steinmann (1976: 417) listed this species for Micronesia generally. The same author later (Steinmann 1979b: 297) merely listed the distribution as being Oceanian. Sakai (1982: 40) indicated Micronesia only.

CAROLINE (GENERAL): Steinmann (1989a: 177, 212, 213, fig. 363, 364).

E. CAROLINE *Pohnpei*: Brindle (1972: 144, 147, fig. 13g-i, 149); Steinmann (1989a: as above; 1989b: 474); Sakai (1991: 3722 [reprint from Brindle, 1972], 3789, figs, locality Nanpil [on Pohnpei], 3790, 2 figs [with 3 other specimens from Upolu, Samoa, presumably not this species], 3913, locality Nanpil [on Pohnpei, with figs reprinted from Brindle, 1972,] also original figs.).

**Marava arachidis** (Yersin, 1860)

Syn.: *Labia wallacei* Dohrn, 1865 = *Marava wallacei*  
(Dohrn, 1865)



*Labia grandis* Dubrony, 1879

*Prolabia ascensionis* Hebard, 1917

etc.

Steinmann (1979b: 287) notes the Oceanian distribution of this cosmopolitan species, but without specific reference to Micronesia.

PALAU *Babeldoab*: Menozzi (1941: 73, as *M. wallacei*); Brindle (1972: 158, 159, fig. 16a, 161, fig. 17a, b). *Garakayo, Koror* and *Peleliu*: Brindle (1972: as preceding).

W. CAROLINE *Yap Gp.* Yap I.: Brindle (1972: as above).

C. CAROLINE *Chuuk*: Townes (1946: 31, as *M. wallacei*). Tol I.: Brindle (1972: as above).

E. CAROLINE *Kosrae*: Menozzi (1941: 73, as *M. wallacei*); Sakai (1970b: 164); Brindle (1972: 155). *Pohnpei*: Hebard (1917: 243, 244, 245, pl. XVI, fig. 8, 9, as *Prolabia ascensionis* from "Ascension Island, South Atlantic [*sic*]"—it would seem that the same error, confusing the oceans in which the island is situated, was made here as in the case of *Diploptera punctata* [Blattodea], see under that species); Townes (1946: 31, as *M. wallacei*); Sakai (1970b: 173, as *M. ascensionis*, from Ascension Island, but ocean not indicated—see Hebard 1917, above); Brindle (1972: as above); Steinmann (1976: 413, as *M. ascensionis*, from Ascension Island, as for Sakai 1970b, above); Sakai (1982: 28, as last); Steinmann (1989a: 453; 1989b: 9, 497; both as last, but synonymizing *ascensionis* with *arachidis*).

MARSHALL (RALIK). *Jaluit*, Pinlep I., and *Kwajalein*, Ebeye I.: Brindle (1972: as above).

KIRIBATI *Butaritari*: Brindle (1972: as above).

### ***Marava feai* (Dubrony, 1879) emend. nov.**

*Labia feae* Dubrony, 1879

The specific name of this species was formed from that of a *man* with the modern Italian patronym "Fea" (Leonardo Fea of Torino, 1852–1903). The *International Code of Zoological Nomenclature* has decreed that the genitive case be formed by adding "i" to the full name, not by declining it in accordance with Latin grammar; "*feae*" could imply feminine gender (which would not be appropriate here), even though there are masculine Latin nouns ending in "-a" that take "-ae" in the genitive singular. The references cited below all use "*feae*".

Steinmann (1979b: 287) noted that this species has an Oceanian distribution, but he did not refer specifically to Micronesia. Similarly, the same author later (Steinmann 1989b: 501) did not refer to Micronesia when giving the distribution of the species, though he cited an *Insects of Micronesia* reference—that of Brindle (1972), below.

PALAU *Peleliu*: Brindle (1972: 158, 160, 161, fig. 17c, d, 162); Steinmann (1989a: 415, 458, fig. 845–848, p. 459).

***Paralabellula* Kevan**  
***Paralabellula brindlei* Kevan**

Brindle (1981: 15) corrected a long-standing misconception regarding the identity of Fabricius' *Forticula annulata*, but Steinmann (1989a: 470, 481, 482, fig. 887–889; 1989b: 575) overlooked this and continued to regard *annulata* as a species of Labiinae, assigning it to his new genus *Paralabella*, of which, unfortunately, he made it the type species. Thus, *Paralabella* Steinmann, 1989, is a junior synonym of *Eurobellia* Burr, 1909. The name was, in fact, first published as a *nomen nudum* by Steinmann (1985: 121), though this is not indicated in the author's catalogue of Dermaptera (Steinmann 1989b: 575). There seems to have been no alternative available name either for *Paralabella* (as distinct from *Labia* Leach, 1815) or for the Neotropical species previously called "*Labia annulata* (Fabricius)," so that new names were needed for both. For *Paralabella*, the name *Paralabellula* is substituted. The species is renamed *Paralabellula brindlei* Kevan, to honor Mr. Alan Brindle for his major contributions to dermapteran taxonomy. As holotype, the specimen from which Steinmann's "gen. prep. No. 918" was prepared (*cf.* Steinmann, 1989a, 1989b) has been selected.

***Paralabellula curvicauda* (Motschoulsky = Motshulskii, 1863)**

Syn.: *Labia curvicauda* Motshulskii, 1863

*Paralabella curvicauda*; Steinmann, 1989

As discussed under *Euborellia annulata* (Fabricius), above, the name *Paralabellula* is substituted for *Paralabella* of Steinmann (1989a: 470) because of the invalidity of the latter.

According to Townes (1946: 31), this species "seems to occur all over Micronesia," but he mentioned no specific island or group. Sakai (1970b: 132) also mentioned it for Micronesia in general terms only. Steinmann (1979b: 291) merely included Oceania in its wide distribution.

OGASAWARA: ? Matsumura (1914: 118, as *Mimolabia boninensis*, n. sp., *nomen nudum*); Shiraki (1927: 74; 1928: 11); Esaki (1930: 208); Furukawa (1930: 231); Kotô (1932: pl. 2, fig. 4); Shiraki (1932: 2029, fig. [1]; 1950: 73, fig. 174); Sakai (1970b: 131).

KAZAN *Iwo-Jima*: Brindle (1972: 114, fig. 4b, 154, 155, fig. 15a, b, 159, fig. 16a).

MARIANA *Guam*: Swezey (1946: 8); Beller (1948: Pt. I: 5 = 8); Sakai (1970b: 132); Brindle (1972: as above). *Saipan* and *Tinian*: Brindle (1972: as above).

PALAU *Angaur*, *Babeldaob*, *Garakayo*, *Koror* and *Peleliu*: Brindle (1972: as above).

W. CAROLINE *Ulithi*, Potangeras I., and *Yap. Gp.* Yap I.: Brindle (1972: as above)

C. CAROLINE *Chuuk*: Moen I. : Brindle (1972: as above).

S.C. CAROLINE *Kapingamarangi*: Brindle (1972: as above).

E. CAROLINE *Kosrae*: Menozzi (1941: 73); Sakai (1970b: 132); Brindle (1972: as above). *Pingelap*: Brindle (1972: as above). *Pohnpei*: Menozzi (1941: 73); Sakai (1970b: 132); Brindle (1972: as above).

MARSHALL (GENERAL): ? Kempny in Schnee (1904: 404, as "KI[eine] Forficulinen-Art . . . sp. ?").

MARSHALL (RALIK) *Jaluit*: Enejat I. and Imej I.: Menozzi (1941: 73, 74); Medyado I.: Brindle (1972: as above). *Kwajalein*: Brindle (1972: as above).

MARSHALL (RATAK) *Arno* and *Majuro*: Brindle (1972: as above).

### ***Spirolabia pilicornis* (Motschoulsky = Motshulskii, 1863)**

Syn.: *Labia pilicornis* Motshulskii, 1863

Steinmann (1979b: 273) indicated that "*Labia pilicornis*" included Oceania in its distribution, but he did not specifically mention Micronesia.

As the generic name *Spirolabia* was proposed only recently (Steinmann 1987b: 179; see also Steinmann 1989a: 506), all the citations below used the generic name *Labia*, except as indicated.

MARIANA: Brindle (1972: 155, fig. 15c, d, 156, 157; referring really to Guam). *Guam*: Rehn (1949c: 110).

PALAU *Angaur* and *Garakayo*: Brindle (1972: as above). *Peleliu*: ? Townes (1946: 31, as "undetermined labiids"); Brindle (1972: as above).

W. CAROLINE *Yap Gp.* Yap I. ? Townes (1946: 31, as "undetermined labiids"); Brindle (1972: as above).

E. CAROLINE *Kosrae*: Brindle (1972: as above). *Pohnpei*: ? Townes (1946: 31, as "undetermined labiids"); Brindle (1972: as above).

### Fam. CHELISOCHIDAE

#### Subfam. CHELISOCHINAE

### ***Chelisoches morio* (Fabricius, 1775)**

Syn.: *Lobophora morio* (Fabricius, 1775)

The name *Lobophora* Audinet-Serville, 1838 (Dermaptera) is preoccupied by *Loboptera* Curtis, 1825 (Lepidoptera).

Schmeltz & Pöhl (1869, 1874) refer to this species as *Lobophora morio* or *L. moria* (*sic*) from various South Pacific localities, though not from Micronesia. Later, however (Schmeltz & Pöhl 1979: 69), they listed "*Lobophora* sp. ?" from the eastern Caroline Islands, as noted below. Borelli (1928: 7) observed that the species is widely distributed throughout the whole of Oceania, though he did not refer specifically to Micronesia. Townes (1946: 31) stated that *C. morio* occurred "on every island visited" in Micronesia, but he named only one (Chuuk, see below). Gressitt (1954: 160) also mentioned the species (as *Chelisoches* only) for Micronesia, without reference to specific islands or groups. Sakai (1971: 123), in addition to mentioning specific island groups (as indicated below), also gave Micronesia generally for its distribution. Steinmann (1983: 141) merely stated that *C.*

*morio* is cosmopolitan, and the same author later (Steinmann 1987: 116, 117) also omitted to mention Micronesia. Samuelson & Nishida (1987: 170) quoted Townes (1946: 31), above. Kevan (1987: 300) observed that the species was one of the earliest of insects to be described from the "South Seas"—the types, from Tahiti, are still in existence (Brindle 1981: 14)—though he did not actually mention its presence in Micronesia, about which he wrote. He did so later, however (Kevan, 1990: 112). Steinmann (1989b: 613–615) made no direct mention of Micronesia for *C. morio*, though he cited Brindle's (1972) Micronesian paper.

MARIANA: Burr (1908: 116); Bryan (1948: 6; 1949: 4; no island directly referred to, but species suggested as possible biocontrol agent against the Mariana coconut beetle, *Brontispa marianae* Speath). *Guam*: Swezey (1946: 8); Beller (1948: Pt. I: 4 = 7); Rehn (1949c: 110, 111); Sakai (1971: 123); Brindle (1972: 163, 165, fig. 19a–e). *Saipan*: Shiraki (1928: 15); Matsumura (1935: 1386 (?); Menozzi (1941: 77); Rehn (1949c: 110, 111); Sakai (1971: 121, 123); Brindle (1972: as above).

PALAU: Matsumura (1935: 1386 (?)); Gressitt (1953a: 98, 153; also 61, 153 as *Chelisoches* only); Sakai (1971: 121); Brindle (1972: as above). *Babeldaob*: Menozzi (1941: 77); Sakai (1971: 123); Brindle (1972: as above). *Garakayo*: Brindle (1972: as above); *Koror*: Shiraki (1928: 15; as "Koral-Polau"); Sakai (1971: 121; reference to last); Brindle (1972: as above). *Peleliu*: Brindle (1972: as above).

CAROLINE (GENERAL—? including Palau Islands): Hincks (1938: 312, 313); Rehn (1949c: 110, 111—latter page cited Menozzi, 1941, as source of Caroline Islands records, which was correct, but, in this regard, he also cited Günther [1933], without giving the reference; the latter author, however, though he mentioned numerous Pacific islands, did not refer to any in Micronesia, let alone the Caroline Islands).

W. CAROLINE *Ulithi*: Fassaroil I., Mog Mog I. and Potangeras I.: Brindle (1972: as above). *Yap Gp.*: Brindle (1972: as above).

C. CAROLINE *Chuuk*: Burr (1912: 326); Menozzi (1941: 77); Townes (1946: 31); Sakai (1971: 122). *Fafan I.*: Menozzi (1941: 77); Sakai (1971: 123). *Moen I.*: Brindle (1972: as above).

S.C. CAROLINE *Kapingamarangi*: Machiro I. and Werna I.: Brindle (1972: as above).

E. CAROLINE *Kosrae*: Menozzi (1941: 77); Sakai (1971: 123); Brindle (1972, as above; with Lele I.). *Pohnpei*: Schmeltz & Pöhl (1879: 69, as "*Lobophora* sp. ?"); Menozzi (1941: 77); Sakai (1971: 123); Brindle (1972: as above).

MARSHALL (GENERAL): Kempny in Schnee (1904: 404).

MARSHALL (RALIK) *Ailingalapalap*: Jabvat (or Jabwot) I.: Ehrhorn (1939: 191). *Ebon*: Brindle (1972: as above). *Enewetak*: Japtan: Brindle (1972: as above); Samuelson & Nishida (1987: 149, 170). *Jaluit*: Ehrhorn (1939: 191); Menozzi (1941: 77; Jabor I.); Sakai (1971: 123; Jabor I.); Brindle (1972: as above).

MARSHALL (RATAK) *Arno*: Brindle (1972: as above). *Majuro*: Brindle (1972: as above; a second entry erroneously lists this atoll as being in the Caroline Islands). *Mili* (or *Mille*): Ngulu I.: Brindle (1972: as above). *Wotje*: Wotje I.: Menozzi (1941: 77); Sakai (1971: 123).

KIRIBATI: Rehn (1949a: 171); Brindle (1972: as above; also jointly with Ellice [= Tuvalu] Islands); Manser (1974: 7; as last). *Tarawa*: Brindle (1972: as above). OCEAN GP. *Nauru*: Froggatt (1910: 408).

[TUVALU: Borelli (1928: 7; "Ellice Is." treated as though they were Samoan!); Hincks (1938: 312, 313); Brindle (1972: as above; jointly with Gilbert [= Kiribati] Islands); Manser (1974: 7; as last).]

### **Hamaxas nigrorufus** (Burr, 1902)

Syn.: *Hamaxas papuensis* Burr, 1909

*Hamaxas esakii* Menozzi, 1941

*Hamaxas papuanus*, auctt. (*lapsus*, only in synonymy)

When Brindle (1972: 169) synonymized the above nominal species, he misspelled Burr's (1909: 16, 17) *H. papuensis* as *papuanus* (*sic*) and gave the pagination incorrectly as "23" (? for "2, 3" of a separately paginated offprint of Burr's paper). The spelling error was repeated by Steinmann (1989b: 626, 627, index 921), although the same author earlier (Steinmann, 1983: 140; 1987a: 115) had spelled the name correctly, but without recognizing the synonymy, or ignoring it.

Bryan (1948: 21) noted that Menozzi (1941, below), had described *H. esakii* from Micronesia, but the former author gave no more precise a locality. Steinmann (1983: 140) also included Micronesia (generally) in the distribution of the species, though later (Steinmann 1987a: 115), he failed to do so.

MARIANA *Saipan*: Brindle (1972: 169, 170, fig. 20a-d, 171; see comment on synonymy, above).

PALAU *Babeldaob*: Menozzi (1941: 78, 79, fig. 3, 80, as *H. esakii*); Sakai (1971: 247; also as *H. esakii* Borelli [*sic*]); Brindle (1972: as above); Steinmann (1989b: 627; see comment on synonymy, above). *Koror* and *Peleliu*: Brindle (1972: as above).

Note: Menozzi (1941) designated no holotype for his new species, *H. esakii*. His *Babeldaob* specimen is therefore here selected as lectotype.

CAROLINE (GENERAL): Steinmann (1989b: 627, citing Brindle 1972, above and below; see also comment on synonymy, above).

W. CAROLINE *Yap Gp.*: Yap I.: Brindle (1972: as above).

C. CAROLINE *Chuuk*: Townes (1946: 31, as *Hamaxas* only). *Dublon I.* and *Moen I.*: Brindle (1972: as above).

E. CAROLINE *Kosrae*: Menozzi (1941: as above); Sakai (1971: as above); Brindle (1972: as above). *Pohnpei*: Menozzi (1941: as above); Townes (1946: 31, as *Hamaxas* only); Sakai (1971: as above); Brindle (1972: as above).

### **Proteus laetior** (Dohrn, 1865)

Sakai (1982: 44) and Steinmann (1983: 142; 1987: 117; 1989b: 636, 637) omitted any reference to Micronesia in giving the distribution of this species, though the latter (1989b) does cite Brindle's (1972) Micronesian paper as a reference.

PALAU *Babeldaob*, *Koror* and *Peleliu*: Brindle (1972: 163, 164, fig. 18).

### Order Cheleutoptera (= Phasmatoptera)

By way of introduction to the stick-insects of Micronesia, it may be of interest to note that at least one species seems to have featured in the folk-art of the Palau Islands. Beasley (1914: 34) and Gathercole et al. (1979: 286) have illustrated a heavy, oval, shell-inlaid, wooden bowl from these islands, the repetitive inlay design of which comprises ten similar, elongate, "quadruped" insects that could quite conceivably have been modeled on *Heterocarpus leprosus* Redtenbacher, 1906, a common, apterous stick insect occurring on the islands. A much larger and more impressive stick-insect from the Palau Islands is *Diagoras ephialtes* Stål, 1877, but the resemblance of the design seems closer to *Heterocarpus*. The bowl measures 58.5 cm at its greatest diameter. It was in the private collection of Faith and Martin Wright of New York. Beasley (1914) stated that the designs on the bowl "are obviously phallic," but this is probably a rather far-fetched hypothesis. It has long been fashionable to interpret anything elongate in primitive art in this way, but it would seem more reasonable simply to accept this design for what it appears to be—a representation of stick-insects—though quite possibly with some element of folklore or mythology associated with them.

It may be pertinent to the above that, elsewhere in the South Pacific, in the Cook Islands, the natives of the Hervey Group apparently held stick-insects—in this case *Graeffea crouanii* (Le Guillou, 1841), *q.v.*—in some awe. They figured in ancient songs and myths and were considered to be the offspring of a goddess named Kui-the-Blind and were associated with the cult of Tanè, who has been compared with Baal (Gill 1885: 160–161). This was also referred to (in Japanese) by Esaki (1943: 839).

In this order, as for most of the world, only the suborder Phasmatodea is represented in Micronesia and the neighboring regions. Though there are scattered references to individual species dating from much earlier, the first general account of Micronesian stick-insects was included in a work by Günther (1932). This author gave details both for species and for the groups or islands concerned, but he also made some general statements. For example, he noted (Günther 1932: 802) that eight species were known for Micronesia. Swezey (1936: 307) referred to unnamed "phasמידs" or "stick-insects" attacking coconuts on Guam in the Mariana Islands; these would have been *Acanthograeffea denticulata* (Redtenbacher, 1908). Esaki (1940b: 408), in a very general, short account of Micronesian insects, observed that "Phasmidae" i.e., Phasmatodea) are widely distributed in Micronesia. The same author (Esaki 1940c: 1–3; 1941: 1–3) noted four genera in his brief discussions of Micronesia; he actually named three of the species, as noted hereafter. A little later (Esaki 1943: 839–840), he named two species in connection with coconuts. Townes (1946: 31) mentioned "other coconut-feeding walking sticks"—besides *Acanthograeffea denticulata*—for the Palau Islands and the central and eastern Caroline Islands (Chuuk and Pohnpei respectively); he also mentioned "a number of species of walking sticks" other than those on coconut palms.

Bryan (1948: 6, 42) referred to stick-insects in the literature for Micronesia generally, as well as giving specific references on other pages (as noted below); he

also gave a record for Guam (his p. 30). Oakley (1953: 180) referred to damage to coconut palms by Phasmatodea of the genera *Acanthograeffea* and *Graeffea* on various of the Caroline Islands (Ulithi Atoll, the Yap Group, the Hall Group, Chuuk and Pohnpei), but he was uncertain of which species was involved in each instance. Gressitt (1954: 160, 178) merely mentioned stick-insects for Micronesia generally; on the latter page, he mentioned "several species of stick insects which feed on coconut[-palm]s and other plants". The same author (Gressitt 1956b: 15) mentioned "moderately large stick insects" from the Mariana, Caroline and Marshall Islands.

A paper by Nakata (1961) is the only work, other than that of Günther (1932, above), that has reviewed the Phasmatodea of Micronesia as such (her p. 113). She gave a brief summary, accompanied by tables, mentioning various island groups. From the Caroline Islands, with which she included the Palau Islands, she noted that four species occur on the latter, one on Chuuk and four on Pohnpei. For the Mariana Islands (Guam, Pagan, Rota, Saipan), she noted that only one species was found. For the Marshall Islands, she also noted but a single species. Five (named) Micronesian Phasmatodea were said to be endemic. It was also indicated that "large walkingsticks" had been collected from the Palau Islands and Kosrae, "but they are still unidentified". The same author (Nakata 1961: 119) also gave the numbers of species and relationships for the Phasmatodea of the Mariana, Caroline (including Palau) and Marshall Islands. References to particular species mentioned by her are included hereafter, as appropriate.

Niering (1963: 155) referred to a large (unnamed) species of stick-insect from Kapingamarangi Atoll in the southeastern Caroline Islands. More recently, Samuelson & Nishida (1987: 160) have referred to the Phasmatodea of Micronesia generally, taking most of their information from Nakata (1961, above), but naming only one species, as will be indicated below. Nine species were said to occur in Micronesia, including four endemic to the Caroline Islands and one to the Marianas.

SUBORDER PHASMATODEA  
Superfam. **NECROSCIOIDEA**  
Fam. **NECROSCIIDAE**  
Subfam. *NECROSCIINAE*

No member of this large superfamily (or of its subordinate taxa) has yet been recorded from Micronesia, but several are known from the Talaud Islands and it may be of interest to note them here. All are recorded by Günther (1934: 79–86). Alphabetically arranged, they are as follows:

**Aruanoidea aruana** (Westwood, 1859)  
**Asceles rulanda** Redtenbacher, 1908, subspecies  
**Hemiplastra stylifera** (Bates, 1865)

This last was recorded by Günther (1934: 86) as *Sipyloidea (Hemiplastra) stylifera*.

**Lamachus xiphias** (Westwood, 1859)**Leprocaulinus insularis** (Kirby, 1896), subsp. **talaudensis** (Günther, 1934)

Günther (1934: 79) described this subspecies in the genus *Leprocaulus* Redtenbacher, 1908, but the generic name was preoccupied; *Leprocaulinus* Uvarov, 1940, has been substituted for it.

## Superfam. PHASMATOIDEA

## Fam. PHASMATIDAE

## Subfam. PLATYCRANINAE

**Acanthograeffea denticulata** (Redtenbacher, 1908)

Townes (1946: 30) recorded this species from Micronesia generally, as did Gressitt (1954: 178, as *Acanthograeffia* [sic], in part). Several references list the species (all with the generic name misspelled "*Acanthograeffia*") for the United States Trust Territory of the Pacific Islands, which could mean almost any island or group (except Guam) from the Line Islands to the Palau Islands, though here, presumably, only the Mariana Islands were involved. These references are: United Nations (1961: 1; 1962: 164), Johnston (1965: 4), Owen (1971: 1) and Kurian et al. (1979a: 11; 1979b: 122).

MARIANA: Redtenbacher (1908: 371, as *Graeffea*; type locality); Zacher (1913: 111, 112, as *Graeffea*); Günther (1932: 761, name *Acanthograeffea* proposed, 827; also 795 as *Acanthograeffea* only, in part); Townes (1946: 31, southern Marianas); Dumbleton (1954: 68, 102, as *Acanthograeffia* [sic]); Gressitt (1956b: 15, as "moderately large stick insects," in part); Nakata (1961: 113, also 114 as *Acanthograeffea* only, in part); Paine (1968: 570, as *Acanthograeffea* only, in part); Samuelson & Nishida (1987: 160, indirectly, as species endemic to the Marianas [unnamed]). *Guam*: Swezey (1936: 307, as "a phasmid" on coconut palms; 1940: 155, 180; 1941: 39); Esaki (1943: 839, incl. fig. 35); Swezey (1946: 7); Oakley (1946: 5, 6); Beller (1948: Pt. I: 4 = 7); Oakley (1953: 180); Dumbleton (1954: 68, 102, as *Acanthograeffea* [sic]); Gressitt (1954: 178, as last; 1956b: 15, as "large stick insects," in part); United Nations (1961: 1; 1962: 164; both as *Acanthograeffia* [sic]); Johnston (1965: 4, as last); Kurian et al. (1979A: 11; 1979B: 122; both as last); Dr. Ilse Schreiner (*in litt.* X.1986). *Pagan*: Esaki (1940a: 276); Yasumatsu (1940: 186, pl. VI, fig. 16, latter damage to coconut fronds, as "*mashina nafushi*" only; 1942: 11, fig. 14, eggs); Esaki (1943: as above); Gressitt (1954: 178, as *Acanthograeffia* [sic]); Nakata (1961: 113). *Rota*: Esaki (1943: as above); Oakley (1946: 5, 6; 1953: 180); Gressitt (1954: 178, as *Acanthograeffia* [sic]). *Saipan*: Günther (1932: 776, incl. fig. 1 [as *A. dentata*, sic], 777, 790); Esaki (1940a: 276; 1940b: 409); Swezey (1940: 155, 180); Esaki (1943: as above); Oakley (1946: 5, 6; 1953: 180); Gressitt (1954: 178, as *Acanthograeffia* [sic]); Nakata (1961: 113).



**Acanthograeffea modesta** Günther, 1932

Gressitt (1954: 178) referred to *Acanthograeffia* (*sic*) from Micronesia generally; this would have included the present species from the Caroline Islands. As with the previous species, several publications refer to *Acanthograeffia* (*sic*) *modesta* from the United States Trust Territory of the Pacific Islands, which could mean almost any group or island (except Guam) from the Line Islands to the Palau Islands, though, in these instances, the Caroline Islands would have been meant. The references in question are: United Nations (1961: 1; 1962: 164), Johnston (1965: 4); Owen (1971: 1) and Kurian et al. (1979a: 46; 1979b: 211).

CAROLINE (GENERAL): Günther (1932: 827; also 795 as *Acanthograeffea* only, in part); Dumbleton (1954: 68, 102, as *Acanthograeffia* [*sic*]); Gressitt (1956b: 15, as “moderately large stick insects,” in part); Paine (1968: 570, as *Acanthograeffea* only, in part).

W. CAROLINE *Ulithi* and *Yap Gp.*: Oakley (1953: 180).

C. CAROLINE: Günther (1932: 761; in error as “Ostkarolinen,” for “Central-Carolinen-Inseln”—*cf.* p. 777). *Hall Gp.* ? Oakley (1953: 180, as *Acanthograeffea* only; also some possibility that *Graeffea crouanii* [below] was involved). *Chuuk*: Redtenbacher (1908: 372; dubiously as *Graeffea lifuensis* Sharp, 1898, a Loyalty Islands species; as “Ruk [for Truk = Chuuk], Carolinen”; *cf.* Günther, 1932: 777); Günther (1932: 777, incl. fig. 2, 778, 790); Esaki (1940b: 409; 1943: 841); Bryan (1948: 14); Potts (1949: 7, as *Acanthograeffea* sp., on coconut); C. Willemse (1951: 356); Oakley (1953: 180; also as *Acanthograeffea* only, though *Graeffea crouanii* [below] may have been involved); Gressitt (1954: 178, as *Acanthograeffia* [*sic*]); Nakata (1961: 113; also 114 as *Acanthograeffea* only).

E. CAROLINE: [Günther (1932: 761 as “Ostkarolinen,” in error for “Central-Carolinen-Inseln,” *cf.* p. 777)]. *Pohnpei*: Oakley (1953: 180, as *Acanthograeffea* only, though *Graeffea crouanii* [below] may have been involved); Gressitt (1954: 178, as *Acanthograeffia* [*sic*]; possibly next species involved); Nakata (1961: 113; also 114 as *Acanthograeffea* only).

**Graeffea crouanii** (Le Guillou, 1841)

Syn.: *Graeffea cocophaga* (Newport, 1844)

*Graeffea coccophaga* (Westwood, 1859) & *auctt.*

Both *Graeffea crouanii* (Le Guillou) and *G. cocophaga* (Newport) were described from the Samoas. The former was originally called “*Bacillus Crouanii*” by Le Guillou (1841: 293), the type locality being misprinted “Hamoā”. The latter was first published as “*Alopus cocophages*, GRAY, MSS.” by Newport (1844: 288) and came from Navigator’s Island. The two were synonymized by W.F. Kirby (1904: 386). There can be little doubt of the correctness of this conclusion, with which Nakata (1961) had clearly concurred before her untimely death, for she did not use the latter specific name, though it had been widely accepted—spelled one way or another—in the past. Redtenbacher (1908), Froggatt (1912), who (pp.

28–29) called the species “*Graeffe (sic) (Lopaphus) coccophagus (sic)*,” Zacher (1913) and Günther (1932) did not mention *crouanii*.

Although *crouanii* takes precedence, a comment should be made on the spelling of *cocophaga*. Westwood (1859: 99) indicated that the species was initially named “*Aplopus Coccophagus* G.R. Gray, MSS.,” which was apparently misprinted *Alopus cocophages*” when published by Newport (1844). Westwood (1859) emended the published specific name to “*Coccophagus*,” but he placed the species in the genus *Lopaphus*. While there were undoubted misprints in Newport’s versions of both generic and specific names—which should have been “*Aplopus*” and “*cocophagus*” respectively—Westwood’s emendation was only partly acceptable. The “restoration” of the double “*c*” in the specific name was unwarranted (even if Gray really wrote the name thus) because it alluded to the insect’s known habit of being, in Newport’s (1844: 288) words, “destructive to young buds of cocoa(*sic*)-nut trees” (*Cocos nucifera* Linnaeus). There was never a suggestion that the stick-insect ate scale insects (*cocci*)! Some authors have, indeed, favoured the use of a single “*c*”. Whether or not they did so consciously is uncertain, except in the case of Rehn (1904: 85), who deliberately reverted to “*cocophages*”. The terminal “-es” does not, however, conform with the present requirements of the *International Code of Zoological Nomenclature*. Bruner (1915: 234), also, purported to give Newport’s original spelling, but spuriously used the double “*c*”!

From the South Sea Islands generally, Schmeltz & Pöhl (1877: 20) and Pöhl (1884: 48) listed *Gräffea purpuripennis* Br[unner von Wattenwyl, 1868], the earlier list misspelling the specific name as “*purpuripenuis*”; *G. purpuripennis*, according to W.F. Kirby (1904: 306), being a synonym of *Graeffea crouanii*. Gill (1885: 158–161, 203) gave an early, brief account of the biology of, and damage caused to coconut palms by, this species under the name of *Lopaphus coccophagus*, the *Phasma*, or “cocoa(*sic*)-eating lopaphus” (p. 159, fig. [12]); he also mentioned certain aspects of folklore attached to it, as noted above in the introduction to the Order. His accounts were mainly for the Cook Islands (Hervey Group), not for Micronesia, but he indicated that the species was common “throughout the Pacific.”

Froggatt (1912: 28–29), calling the insect “*Graeffe (sic) (Lopaphus) coccophagus*” and quoting Gill (1885, above), also gave a wide distribution in the Pacific, mentioning the Caroline Islands. Zacher (1912: 489–491, incl. figs 11, 12; 1913: 110–114), who referred to the species as “*Graeffea cocophaga*,” citing both Gill (1885) and Froggatt (1912), also mentioned the species as being injurious to coconut palms in the South Sea Islands generally, but he did not mention Micronesia. Bruner (1915: 234), gave the distribution of “*G. coccophaga*” (*sic*) as “entire Oceanica (*sic*) and adjoining islands,” in which Micronesia would have been included by implication. Carl (1915: 175) specified Micronesia (in general terms). Simmonds’ (1925) account of the pests of coconut palms in the “southern Pacific” mentioned *Graeffea coccophaga (sic)*, but no nearer to Micronesia than “Wallis Island, Futuna, and the adjacent groups”; his later work (Simmonds 1938) was simi-

lar. Hopkins (1927: 23) implied a Micronesia distribution for "*Graeffia coccophaga*" (*sic*); the Tuvalu (Ellice) islands were also implied, though not specifically mentioned in this regard. Günther (1932: 777, as *Graeffea coccophaga*; 802, 827, as *Graeffea* only; 1938: 271 incl. fig. 284, as *G. coccophaga*) also gave the South Sea Islands or Oceania only in general terms as the distribution of the species (which did serious damage to coconut plantations), though he specified the Caroline Islands elsewhere, as noted below. Esaki (1943: 840, 841) discussed "*Graeffea coccophaga*" (*sic*) as a Micronesian coconut pest; he cited (in Japanese) both Gill (1885, above), at some length, and Zacher (1913, above). Lepesme (1947: 138) gave a wide Pacific range for this coconut-palm pest, including the Caroline Islands generally. He also observed (p. 140) that "*Graeffea Crouani*" is probably a synonym of *G. coccophaga* (*sic*), in which case the former name has priority.

A number of references have listed the species as "*Graeffia coccophaga*" (*sic*) or as "*Graeffia crouani*" (*sic*), or as both, for the United States Trust Territory of the Pacific Islands, which could include almost any group or island (except Guam) from the Line Islands to the Palau Islands, though, in the present instance, probably only the Caroline Islands were involved. These references are: United Nations (1961: 1; 1962: 164), Johnston (1965: 4) and Kurian *et al.* (1979a: 46; 1979b: 211). Lever (1969: 27, 28) referred to "*Graeffea crouani*" (*sic*) as being the correct name for "*G. coccophagus*" (*sic*); he mentioned its wide distribution among the Pacific islands, but made no specific reference to Micronesia, even though he cited Nakata (1961—as "1962"!), who had done so. Stelzer's (1970) paper on insecticidal control measures against *Graeffea crouanii* (correctly spelled!) related only to the Samoas (and is thus of no concern here), but this is not apparent from his title. Smith *et al.* (1979), in dealing with the defensive secretion of the species (as *Graeffea crouani* [*sic*]), using Fijian material, stated that it is "a widespread pest of coconut palms in the South Pacific region," without more specific reference to islands or groups, but they cited Dumbleton (1954) who listed Micronesian localities (see below).

It will be noted from the foregoing remarks that the generic and both specific names have been variously spelled (or misspelled) by different authors. In the citations below, the form used was (incorrectly) *Graeffea coccophaga* unless otherwise indicated.

Palau: ? Townes (1946: 31, as "other coconut-feeding walking sticks," in part); Gressitt (1954: 178).

The occurrence of this species in the Palau Islands needs confirmation. There is, however, a nymph in the Academy of Natural Sciences of Philadelphia, which possibly belongs to *G. crouanii*. It has the following data: "Micronesia. Caroline Is'ls. Palau Group. Babelthuap [=Babeldaob] on W. side, near Aimeliik, 7°26'30" N. 134°31'00" E. 19–26 February 1987. Captured in forest. (Otte, Alexander, Flinn)"

CAROLINE (GENERAL, presumably not including Palau Islands and referring only to the eastern Caroline Islands proper): Redtenbacher (1908: 371; also as

*G. rosae* Houttuyn in Stoll', 1813); Holdhaus (1908: 545 [sep. p. 9]); Froggatt (1912: 28, as *Graeffia* [sic] (*Lopaphus coccophaga*); Zacher (1912: 489–491, incl. figs 11, 12, as *G. coccophagus*); Günther (1932: 790; also 795 as *Graeffia* only); Seurat (1934: 48); Lepesme (1947: 138; "*G. Crouani*" given as probable senior synonym, p. 140); Bryan (1948: 12, as *G. coccophaga*); C. Willemse (1951: 356); Dumbleton (1954: 68, 102, as *Graeffia crouani* [sic]); Nakata (1961: 113, as *Graeffia* only; 117, as *G. crouanii*); Swaine (1969: 75, as *G. crouani* [sic]).

W. CAROLINE *Ulithi* and *Yap Gp.* ? Oakley (1953: 180, as *Graeffia* only; could possibly refer instead to *Acanthograeffia modesta* Günther).

C. CAROLINE *Hall Gp.* ? Oakley (1953: as above). *Chuuk*: ? Townes (1946: 31, as "other coconut-feeding walking sticks," in part); ? Oakley (1953: as above).

E. CAROLINE *Pohnpei*: Esaki (1940b: 409; 1943: 840, 841, incl. fig. 36 [damage]): ? Townes (1946: 31, as "other coconut-feeding walking sticks," in part); Oakley (1953: 180); Gressitt (1954: 178, as *Graeffia*; possibly this species or last); Nakata (1961: 114, as *Graeffia* only); Paine (1968: 569, as *G. crouanii*).

KIRIBATI: Dumbleton (1954: 68, 104, as *Graeffia crouani* [sic]); United Nations (1961: 1; 1962: 164; both as *Graeffia coccophaga* and *Graeffia crouani*; in conjunction with Ellice [Tuvalu] Islands); Johnston (1965: 4, as *Graeffia crouani*; as last); Manser (1974: iii, 4, 7, 23, as *Graeffia crouani*; last 2 pp. also as *G. coccophaga*; all but p. 4 jointly with Ellice [Tuvalu] Islands). Kurian et al. (1979a: 24; 1979b: 121; both as *Graeffia crouani*). *Abemama*: Paine (1968: 569, as *G. crouanii*); Manser (1974: 4, as *Graeffia crouani*).

[OCEAN GP *Nauru* and *Banaba* (Ocean): Paine (1968: 569, as *G. crouanii*) mentioned that the species is not yet known from these islands.]

[TUVALU: United Nations (1961: 1; 1962: 164; both as for Kiribati Islands, above); Johnston (1965: 4, as last); Paine (1968: 489; as for Ocean Group, above); Manser (1974: as for Kiribati Islands, above); Kurian et al. (1979a: 7; 1979b: 113; both as *Graeffia crouani*); *Niutao*: Manser (1974: 4, as *Graeffia crouani*).]

### *Megacrania* sp. (? *M. batesii* Kirby, 1896)

The genus *Megacrania* Kaup, 1871, is still in need of further revision (Hsiung, 1991), but only a single species appears to occur in Micronesia. This is probably, but not certainly, referable to *M. batesii* of W.F. Kirby (1896: 471). The type of that species is from the Solomon Islands though various other islands were also implicated to varying degrees. The species appears to be widely distributed in the southern Pacific region.

Günther (1933) did not consider *M. batesii* (as *batesi*) to be distinct from *M. alpheus* (Westwood, 1859), but neither did he formally synonymize the two until a little later (Günther 1955). It is clear, however, that Nakata (1961) was convinced that this was incorrect. With this latter opinion (that the two species are distinct) we concur, for Kevan has compared the types of both, which are in the British Museum (Natural History) [now also called The Natural History Museum], London. Yasumatsu (1942) was also of the opinion that what he presumed to be the two species were different (the

forms of the eggs confirmed this). His "*M. alpheus*," however, was from Taiwan and, in fact, referable to *M. tsudai* Shiraki, 1933, a good species in its own right and not a synonym of *M. alpheus* as some authors have considered it to be. This is discussed by Hsiung (1991), who distinguishes between several species of the genus.

Westwood (1859) described *M. alpheus* from both "Ceylon" and the Philippine Islands. Günther (1933) questioned the veracity of the former locality, and he was surely correct to do so, though one of the type specimens indeed bears a round label inscribed "Ceylon". I believe that this specimen is mislabeled. It is probable that it, too, came from the Philippine Islands. The syntype labeled as being from the latter is here designated as lectotype.

While it is just possible that *M. alpheus* might occur in the Palau Islands, the species found on other island groups is certainly not this. Nakata (1961: 117), who recognized *M. alpheus* as occurring elsewhere, accepted *M. batesii* (as did other authors) as the name to be used for all *Megacrania* populations from Micronesia (including those from the Palau Islands). At present, no purpose would be served by disagreeing with this verdict.

Although Günther was, for the most part, more specific regarding the Micronesian distribution of what he wrongly called *M. alpheus*, he gave this, on one occasion (Günther 1932: 802), in general terms only. As *M. batesi*, Esaki (1940c: 1; 1941: 1) also gave the distribution as Micronesia only, as did Nakata (1961: 110), though she was more specific elsewhere in the same paper. Owen (1971: 1) recorded the species (again as *M. batesi*) from the United States Trust Territory of the Pacific Islands, which could have meant almost any group or island (except Guam) from the Line Islands to the Palau Islands, though he probably referred here more particularly to the Palau, Caroline and Marshall Islands. Kevan (1990: 114) mentioned the species (once more as *M. batesi*) for Micronesia generally, without reference to specific islands or groups.

In the citations below, the name of the species is given, unless otherwise indicated, as *Megacrania batesi*, with a single terminal "i".

Palau: ? Schmeltz & Pöhl (1877: 20, as "*Platycrania rugosa* Br[unner von Wattenwyl]," *nomen nudum*); Redtenbacher (1908: 369); Carl (1915: 193); Günther (1932: 790, 827; also 795 as *Megacrania* only); C. Willemse (1951: 328, 356, as *M. alpheus*); Nakata (1961: 114, as *Megacrania* only; ? also 113 as "large walkingsticks . . . still unidentified"); Key (1974: 49). *Angaur*: Esaki (1940c: 1; 1941: 2); Yasumatsu (1942: 12, fig. 16 [egg]); Nakata (1961: 113). *Koror*: ? five small nymphs in the Academy of Natural Sciences of Philadelphia, labelled as follows: "Micronesia. Caroline Isl's. Palau Group. Koror. 2 miles N. of Airport, ca. 7°23' N. 134°32' E. 19–26 Feb. 1986 [*sic* for 1987]. In forest. (Otte, Alexander, Flinn)".

CAROLINE (GENERAL): Günther (1932: 827; also 795 as *Megacrania* only; may have included Palau Islands); Gressitt (1954: 184, as "large stick insects," in part; 1956b: 15, as "moderately large stick insects," in part); Nakata (1961: 113 as a "widely distributed species of *Megacrania*," 117, as *M. batesi batesi*, as distinct from *M. b. speiseri* Carl, 1915, from the New Hebrides [Vanuatu]; latter could be a good species).

S.E. CAROLINE *Kapingamarangi*: ? Niering (1963: 155, as “a large species of Phasm[at]idae”).

E. CAROLINE *Kosrae*: Gressitt (1954: 184); Nakata (1961: 114; ? also 113 as “large walkingsticks . . . still unidentified”). *Pohnpei*: Redtenbacher (1908: 369); Günther (1932: 790); C. Willemse (1951: 356, as *M. alpheus*).

MARSHALL (GENERAL): Gressitt (1954: 184; 1956b: 15, as “moderately large stick insects,” in part); Nakata (1961: 115; also 117, as *M. batesi batesi*, see under Caroline Islands, above); Samuelson & Nishida (1987: 160; noted that the species was not yet known from Enewetak Atoll).

MARSHALL (RALIK) *Ebon*: Gressitt (1954: 184); Nakata (1961: 113).

### ***Platycrana viridana* (Olivier, 1792)**

Syn.: *Mantis gigas* [nec Linnaeus, 1758]; Houttuyn, 1766

*Mantis Jamaicensis* [nec Drury, 1773]; Stoll', 1787 (name unavailable)

*Mantis viridana* Olivier, 1792

*Pasma edule* Lichtenstein, 1796, 1802

*Mantis viridis* Donovan, 1800

*Pasma jamaicensis* Houttuyn in Stoll', 1813

*Pasma grandis* Thunberg, 1815

*Cyphocrana viridana*; Audinet-Serville, 1831

*Platycrana viridana*; G.R. Gray, 1835; Audinet-Serville, 1838

*Cyphocrania viridana*; Burmeister, 1838

*Pasma (Cyphocrania) viridanum*; Haan, 1842

*Platycrania edulis* Westwood, 1859

*Platycrania Viridana*; W.F. Kirby, 1904

*Platycrania edulis*; Redtenbacher in Brunner von Wattenwyl & Redtenbacher, 1908, etc.

The above rather extensive (though by no means full) synonymy is given here because of the inconsistencies over the years regarding the name of this species, currently placed in the genus *Platycrana* of G.R. Gray (1835: 36). At the generic level, Westwood's (1859: 112) emendation to *Platycrania* has been used, but this is not acceptable according to the *International Code of Zoological Nomenclature*, as there is no evidence of a *lapsus calami* or typographical error in the original. Thus *Platycrana*, not *Platycrania* must be used.

Regarding the specific name, there has been great confusion, which seems never to have been discussed—and which the first author may yet not have completely overcome. The earliest name of the species would appear to have been *Mantis gigas* Houttuyn, 1766, but, if this was not a misidentification of *Gryllus (Mantis) gigas* Linnaeus, 1758, it is an homonym. On either count, therefore, *gigas* is not available. The next relevant name would appear to have been *Mantis jamaicensis* of Stoll' (1787: 18, pl. VI, figs 20 [♀] and 21 [♂]), but the name is unavailable as of that author and date because (a) this was a misidentification of *Mantis jamaicensis* Drury, 1773, to whom Stoll' referred, and (b) the author did

not consistently use Latin binominal nomenclature. Indeed, this is one of the few examples of his having done so. Most of the names generally attributed to Stoll' (including *Phasma jamaicana*) were, in fact, published by Houttuyn in 1813 as editor of a posthumous edition of Stoll's work (less than half of which appeared in the latter's lifetime).

The earliest *valid* name for the species would seem to be *Mantis viridana* Olivier, 1792, which has been accepted by some authors, most influentially by G.R. Gray (1835: 36) and W.F. Kirby (1904: 385), but not by others. Notable among the latter were Westwood (1859: 112) and Redtenbacher in Brunner von Wattenwyl & Redtenbacher (1808: 369), who used *Platycrania edulis* (Lichtenstein, 1796/1802). Westwood (1859) chose to use the name *edulis*, rather than *jamaicensis*, for stated reasons that are no longer acceptable under the provisions of the *International Code of Zoological Nomenclature*. Why he rejected *viridana* Olivier, which has priority, and which he actually cited as a synonym, he did not say. Half a century later, Redtenbacher (1908) accepted Westwood's choice uncritically, repeating the synonymy given by Westwood and adding other erroneous references to the list, which, if correct and properly applied, would give precedence to a Linnaean name!

It is interesting to note that, Günther, a modern, leading authority on the classification of Phasmatodea, at one time (Günther 1928: 624) used the earlier name, as *Platycrana viridana* (Olivier, 1792), and gave *edulis* (Lichtenstein, 1802 [*sic*]) as a junior synonym—which would appear to have been correct, though he referred uncritically to Redtenbacher (*loc. cit.*) for further synonymy. Günther gave no explanation as to why *gigas* and *jamaicensis*, both senior to *viridana*, had been passed over—though the reasons are given above. The same author later (Günther, 1934: 79; and subsequently) reverted; without explanation or indication of synonymy, to *Platycrana edulis*. It seems that this name has been generally accepted subsequently, though references to the species in the literature are few.

While Lichtenstein (1796: 77; 1802: 13, 14) based his *Phasma edule* on the illustrations by Stoll' (1787: pl. VI, fig. 20, 21) of what the latter (Stoll', *op. cit.* 18) had incorrectly called *Mantis Jamaicensis* Drury, he also referred to Houttuyn's (1766: 136[-138], pl. LXXXIX, fig. 1) invalid *Mantis grandis*. That the latter belonged to the same species is borne out by the fact that Lichtenstein (1802: 14) cited Valentinus (or Valentini, 1704) from Houttuyn (*op. cit.* 138) as stating that the species was eaten as food by Malays. Houttuyn says "[Oost-]Indiaanan" and spells the author's name as Valentyn, noting, too, that legs and wings are removed first. Westwood (1859: 112) and Redtenbacher in Brunner von Wattenwyl & Redtenbacher (1908: 369) both noted this also.

Should *P. viridana* (Olivier) prove, after all, to differ taxonomically from *P. edulis* (Lichtenstein), an additional problem of nomenclature would arise, because there is an unresolved controversy concerning the validity of Lichtenstein's (1796) names. Between these and his definitive paper (Lichtenstein 1802) there intervenes *Mantis viridis* Donovan, 1800, which would take precedence if Lichtenstein's earlier date were not accepted! The matter needs to be settled by the Inter-

national Commission on Zoological Nomenclature. Lichtenstein's (1796) publication was, to all intents and purposes, little more than a catalogue and it contained a large number of *nomina nuda*, but many of the names published therein, although not-accompanied by formal descriptions, were, as in the present case, associated with previously published descriptions and illustrations. Thus, since the publication consistently used binominal Latin nomenclature throughout, such names are frequently accepted by various authors as being valid for different groups of insects. There has, however, been little uniformity of treatment. Some authors have ignored the catalogue in question and have recognized only those names that have been published later, whether or not they were proposed by Lichtenstein. In the present case, Lichtenstein (1802) himself later published the formal descriptions, so that some authors have accepted the later, but not the earlier, date. Here the non-acceptance of the 1796 publication would invalidate *P. edulis* (Lichtenstein) in favour of the unused *P. viridis* (Drury), so that it is clearly preferable to accept such of Lichtenstein's 1796 names as are not *nomina nuda*. So long as *edulis* is considered to be a junior synonym of *viridana*, the problem is purely academic, but it draws attention to wider issues that require attention.

*Platycrana viridana* (or *edulis*!) is so far unknown from Micronesia, but it is just possible that its range might extend to the Palau Islands—which is the justification for the lengthy discussion above. It is known from the Talaud Islands.

TALAUD: Günther (1934: 79, as *P. edulis*).

#### Subfam. PHASMATINAE

#### **Diagoras ephialtes** Stål, 1877

Syn.: *Eustygea godeffroyi* Brunner von Wattenwyl, 1907

Palau?: Schmeltz & Pöhl (1877: 20, as "*Phybalosomo* [*sic*, for *Phibalosoma*] *Kubaryi* Br[unner von Wattenwyl], *nomen nudum*"); Stål (1877: LXVI; type locality); W.F. Kirby (1904: 361); Brunner von Wattenwyl (1907: 186, pl. VII, fig. 2, as *Eustygea Godeffroyi*; type locality); Redtenbacher (1908: 444); Bruner (1915: 237; listed as a Philippine insect, but from "? Palau = Insel," perhaps confusing Palawan [Philippines] with Palau or Peleu = Palau Islands); Günther (1932: 756, 761, 791, 827; also 796 as *Diagoras* only; 756 synonymized *Eustygea godeffroyi* with *D. ephialtes*); Esaki (1940c: 1; 1941: 1); Bryan (1948: 28); C. Willemse (1951: 356); Nakata (1961: 113; noted as endemic to Micronesia; 114, as *Diagoras* only).

#### **Hermarchus godeffroyi** Redtenbacher, 1908

CAROLINE (GENERAL): Carl (1915: 175, as *Hermarchus* only, in part); Günther (1932: 828; also 796 as *Hermarchus* only); Nakata (1961: 116).

E. CAROLINE *Pohnpei*: Redtenbacher (1908: 447, 448, as *H. Godeffroyi*; type locality); Günther (1932: 791; also 802 as *Hermarchus* only); C. Willemse (1951: 356); Nakata (1961: 113; also 114 as *Hermarchus* only).



**Phryganistria plateni** Dohrn, 1910

This species is not yet known from Micronesia.

TALAUD: Günther (1934: 77, 78, fig. 1, 2, 94, fig. 5).

Superfam. **BACILLOIDEA**Fam. **BACILLIDAE**Subfam. **OBRIMINAE****Datames oilens** (Westwood, 1859)

This species is not yet known from Micronesia.

TALAUD: Günther (1934: 76).

**Heterocopus leprosus** Redtenbacher, 1906

PALAU: Redtenbacher (1906: 46, pl. I, fig. 7); Bruner (1915: 27; "Pelew Is."—given as if they were in the Philippines; ? confusion with Palawan, which is so); Günther (1932: 786, 827; also 793 as *Heterocopus* only); Rehn & Rehn [(1938: 415; reference also to Bruner 1915, above); C. Willemse (1951: 356; see also below under Peleliu); Nakata (1961: 113; also 114, as *Heterocopus* only). *Koror*: 1 ♂, last-instar nymph and 1 very young nymph in the Academy of Natural Sciences of Philadelphia, with the following data: "Micronesia. Caroline Isl's. Palau Group, Koror, 2 miles N. of Airport. ca. 7°23' N. 134°32' E. 19–26 Feb 1986 [*sic*, for 1987]. In forest. (Otte, Alexander, Flinn)". *Peleliu*: C. Willemse (1951: 328, 331, 356, 361, pl. IX, fig. 2).

CAROLINE (GENERAL): Günther (1932: 827; also 793 as *Heterocopus* only); C. Willemse (1951: as above; as E. and W. Caroline Islands).

E. CAROLINE *Pohnpei*: Redtenbacher (1906: 46, pl. I, fig. 7); Günther (1932: 763, 786); C. Willemse (1951: 356); Nakata (1961: 113; also 114 as *Heterocopus* only).

**Theramenes olivaceus** (Westwood, 1859)

Syn.: *Theramenes dromedarius* Stål, 1877

Westwood (1859) described his *Eurycantha olivacea* from "Ceylon," but, as with one of his *Megacrania alpheus* syntypes (see under *M. ? batesii*, above), the specimen was doubtless mislabelled. It is more probable that the type of *olivacea*, in the British Museum (Natural History) [now also known as The Natural History Museum], London, came from the Philippines.

This species is not yet known from Micronesia, but it occurs on the Talaud Islands.

TALAUD: Redtenbacher (1906: 37, 38; also 38, pl. I, fig. 2, 3a, b, as *T. dromedarius*); Bruner (1915: 228, under both names); Günther (1934: 75; *T. dromedarius* synonymized).

Superfam. **PHYLLIOIDEA**  
 Fam. **PHYLLIIDAE**  
 Subfam. **PHYLLIINAE**  
**Chitoniscus** sp. (? *C. brachysoma* (Sharp, 1898))

As *C. brachysoma* was described (in the genus *Phyllium* Illiger, 1798) from the Loyalty Islands, and does not seem to have been recorded from anywhere between these and the Palau Islands, it seems improbable that what has been so named for the latter group belongs to the same species. A proper revision of the genus is necessary.

Esaki (1940c; 1941; see below) referred to *C. brachysoma* from Micronesia, noting that it produces a flowery-smelling, milky secretion. The same name was used in the citations below, except where otherwise indicated.

Palau: Redtenbacher (1906: 179); Carl (1915: 173); Günther (1932: 786, 827; also 793 as *Chitoniscus* only); Esaki (1940b: 407, only as "Phasmidea—Phyllinae"; 1940c: 2; 1941: 3); C. Willemse (1951: 356); Nakata (1961: 113, as *Chitoniscus* sp.; also 115, 118 as *Chitoniscus* only). *Babeldaob*: Yasumatsu (1942: 12, fig. 17 [egg]). *Peleliu*: C. Willemse (1951: 328, as *Chitoniscus* sp. [juv.]).

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