INSECTS OF MICRONESIA
PSOCOPTERA

BY
IAN W. B. THORNTON, S. S. LEE, AND W. D. CHUI

ANOPLURA, SUPPLEMENT

BY
NIXON WILSON

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INSECTS OF MICRONESIA
Psocoptera

By IAN W. B. THORNTON*, S. S. LEE, and W. D. CHUI.

INTRODUCTION

Some psocids occur in cryptic habitats such as leaf litter, termitaria, birds’ nests, caves, under bark and dead logs, and in domestic situations and stored products; many of these species are apterous. Some have been recorded on rats and on birds—presumably these were casual wanderers inhabiting the nests. Most Psocoptera, however, occur on rocks or on the trunks, twigs and leaves of trees and shrubs; these are usually fully winged forms.

They feed mainly on microflora and organic debris, such as moulds, rusts, algae, pieces of bark, pollen grains, and insect exuviae. Some have been shown to have distinct food preferences (Broadhead and Thornton, 1955; Broadhead, 1958) either feeding chiefly on lichens or on Pleurococcus on the twigs of trees. There is evidence, in the case of the lichen feeders, that some species selectively feed on certain parts of the lichen, the fruiting bodies, cropping these to a certain depth. In some arboreal psocids, the distribution of food may lead to pronounced differences in their relative numbers on different tree species (Broadhead and Thornton, 1955; New, 1970).

Those forms which are fully winged are relatively sedentary; many only infrequently take to flight, and then normally fly for only short distances of about one or two meters (Broadhead and Thornton, 1955). On the other hand they are small, light, and have a fairly high surface area to volume ratio, thus being well suited for aerial dispersal. There is some evidence that they take to flight most readily on warm hot days, when warm up-currents are most likely to lift them passively into the upper air. A period of flight activity or aerial dispersal is sometimes an integral phase of the life history (New, 1969).

Some species occur unusually frequently in the aerial plankton (Thornton, 1964; Thornton and Harrell, 1965). These often occur in temporary habitats, and may be fairly widely distributed. They are relatively easily dispersed.

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either in the upper air or by man's agencies, and some of them can colonize easily after a successful landfall. These are the psocid "weeds," and they do not usually form endemic complexes after successful establishment in a new area or island, presumably because the frequency of successful landfalls provides sufficient cohesion to maintain the original species gene complex, and divergence from this is thus prevented. Possibly these forms have an "all-purpose" genotype, which enables them to survive in a wide spectrum of ecological situations, again reducing the possibilities of isolation and making speciation less likely to occur.

By contrast, other forms are clearly much less frequently carried in the upper air; moreover, many of these forms are not associated with man and are thus unlikely to be dispersed by commerce. It might be expected, since the chances of these forms achieving subsequent landfalls are very low, and also because of their relatively limited normal flight range, that endemic species complexes would be evolved fairly readily in environments which are heterogeneous and discontinuous, such as isolated archipelagos; indeed, very large endemic complexes of such psocids do exist in the Hawaiian Islands, and somewhat smaller ones in Madagascar (Smithers, 1964; Badonnel, 1967), the Fiji Islands (Lee and Thornton, 1967) and probably also in the Galapagos archipelago. Those forms which make up endemic complexes, at least in the Hawaiian archipelago, have quite restricted ecological tolerances and exist in small, localized populations.

Micronesia (frontispiece) consists of groups of archipelagos made up of high islands and low coralline atolls, and, as would be expected, psocids falling into both the above categories occur within this area of the Pacific.

This work is a report on a number of collections made in Micronesia since 1938 and loaned to the senior author by the B.P. Bishop Museum. The psocid fauna of the area is described, and its relationships and affinities discussed as far as is possible in the present state of knowledge. The psocid fauna of a number of possible source areas such as the Philippines and the Papuan sub-region is unfortunately inadequately known at the present time, and a true assessment of the faunal affinities with these areas cannot therefore be provided until this situation is improved.

The United States Office of Naval Research, the Pacific Science Board (National Research Council), the National Science Foundation, and B.P. Bishop Museum have made this survey and the publication of the results possible. Field research was aided by a contract between the Office of Naval Research, Department of the Navy, and the National Academy of Sciences, NR 160–175.
Thornton, Lee & Chui—Psocoptera

The collections are deposited in the U. S. National Museum (US), B.P. Bishop Museum (BISHOP), Field Museum in Chicago (FM) and in Kyushu University, Fukuoka, Japan (KU).


METHODS

The collections used in this study comprise both dry-mounted and alcohol-preserved specimens. The latter are the more useful, except for the scaly winged families, in which both methods of preservation are necessary. Psocids are soft-bodied, and shrivel and distort when preserved dry, necessitating laborious softening before genitalic dissections can be attempted. On the other hand, the scaly-winged forms lose their scales in alcohol so that the wing pattern formed by the scales cannot be known unless dry specimens of the species concerned are also available for study. There is a fading of coloration of almost all psocids as a result of long storage in alcohol.

Dry-mounted specimens were softened by soaking for a few minutes in a dilute solution of detergent until the insect floated free from its card point or could be freed from its pin. Coloration of dry specimens was noted before softening, and where possible both alcohol and dry-preserved specimens were compared. The left hind leg, antenna and right wings were mounted in Euparal on a slide, the abdomen macerated in KOH, stained in acid fuchsin, cleared in Euparal Essence, and the genitalia dissected in Euparal and mounted on a slide. Where possible, wings of scaly-winged forms were examined both dry (for scale pattern) and in alcohol (for venation and membrane pigmentation). Drawings were made with the use of a microprojector.

The family classification, with few exceptions, is that of Badonnel (1951) and a conservative attitude to genera is maintained throughout.

In the taxonomic treatment the full Micronesian distribution of species is provided, including all data provided by collectors. Nomenclature of wing veins follows that of Badonnel (1951) except that "rs" is preferred to "rr." Nomenclature of genitalia follows that of Badonnel (1956).

HISTORICAL

The only published work on Micronesian psocids is that of Banks (1942)
who studied, without dissection, collections made by Usinger and Swezey on
the island of Guam. Thirteen species were recorded, and these are accepted
below at face value, unless there is good evidence for rejection. The records
of \textit{Psocus kauaiensis} and \textit{Ecopsocus hawaiensis} are not accepted, and those of
\textit{Psylloneura simbangana}, \textit{Peripsocus suffitus} and \textit{Myopsocus bakeri} are regarded as
questionable.

Gressitt (1954) gave the estimated psocid fauna of Micronesia as 40 species.
The present work deals with 90 species (the family Liposcelididae has not been
treated). The reader is referred to Gressitt (1954, p. 193) for comments
on the coverage and type of collecting by field workers up to 1954. As far
as Psocoptera are concerned, by far the largest and richest collection was
made by Dybas on Saipan and Tinian in the Southern Marianas. This
probably genuinely represents a richer fauna than other island groups,
although Dybas' collecting methods may have been more efficient for psocids
than those of some other workers. It is likely therefore that species not re-
corded from the Southern Marianas but recorded from elsewhere in Micronesia
are genuinely absent from the Southern Marianas. The reverse situation
probably does not have the same degree of significance.

**ZOOGEOGRAPHY**

The distribution of species within Micronesia and elsewhere is shown
in Table 1.

The known fauna of Micronesia now comprises 90 species in 25 genera,
giving an average number of species per genus of 3.6. This is considerably
higher than that for continental islands such as Great Britain, Taiwan, Hong
Kong, the Philippines and Japan (Table 2). It is lower than the figure for
Madagascar, (Badonnel, \textit{in litt.}), which has probably been isolated from Africa
since the Eocene, and where there has been considerable speciation of the
genus \textit{Amphipsocus} (Smithers, 1964). It is very much lower than the figure
for the extremely isolated and oceanic Hawaiian archipelago, where explosive
speciation has occurred in two lines of psocids.

Of the high island groups, the Southern Marianas have by far the greatest
representation (54 species). Next, in order, are Palau (25), Ponape (16),
Truk and Yap (14), Kusaie (13), the Bonins (8), Northern Marianas (5),
and Volcanos (2). The Marshalls have 16 species represented in the collec-
tions; the Gilberts 8. The Caroline atolls have 9 species, and Wake I. and
Ocean I. each have 1. This representation shows a fairly good correlation to
land areas of these island groups (fig. 1) but appears to be quite unrelated
to elevation. The regression of number of species on land area, however,
Table 1. Distribution of Micronesian Psocoptera

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<tr>
<th>Micronesian Island Groups</th>
<th>Caroline</th>
<th>Other Localities</th>
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<td>Rota</td>
<td>Volcano</td>
<td>N. Marianas</td>
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<td>Lepidopsocidae</td>
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<tr>
<td>1. Cytophania marginata</td>
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<td>2. Echmepteryx lunulata</td>
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<td>3. E. madagascariensis</td>
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<td>(Kolbe)</td>
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<td>4. E. picticeps</td>
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<td>5. E. dybasi</td>
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<td>6. E. carolinensis</td>
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<td>7. Lepidopsocus maculatus</td>
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<td>8. L. marmoratus (Banks)</td>
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<td>9. L. pretiosus (Banks)</td>
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<td>10. L. pallidus</td>
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<td>11. Nepticulomima bothriata</td>
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<td>12. N. lineatus</td>
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<td>13. Soa dahliana End.</td>
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<td>Psyquillidae</td>
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<td>14. Rhyopsocus pandanicola</td>
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<td>Psyllipsocidae</td>
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<td>15. Psyllipsocus ramburii</td>
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<td>Pachytrictidae</td>
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<td>16. Pachytrictes insularis</td>
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<td>17. Tapinella formosana End.</td>
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<td>18. T. mariana</td>
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<td>19. T. picticeps</td>
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<td>Caeciliidae</td>
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<td>20. Caecilius analis Banks</td>
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<td>21. C. arotellus Banks</td>
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<td>22. C. casarum Bad.</td>
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<td>23. C. novoguineensis End.</td>
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<td>24. C. apicatus</td>
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<td>25. C. fuscipennis</td>
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<td>26. C. kraussi</td>
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</table>

- Mangarevas, Samoa, Fiji, Fanning
- Hawaii
- Africa, Madagascar, Seychelles, Hong Kong, Kermadecs, Hawaii, Chile, Neotropics
- Hawaii
- Hawaii
- Bismarck Archipelago
- Widespread
- India, Taiwan, Hawaii
- Palawan
- Hawaii
- Africa, Hong Kong, Fiji, Samoa, Hawaii, C. America
- New Guinea, Fiji, Samoa
Table 1. Distribution of Micronesian Psocoptera

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<thead>
<tr>
<th>Micronesian Island Groups</th>
<th>Carolines</th>
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<td>West Pacific</td>
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<td>27. C. leuroceps</td>
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<td>28. C. marginatus</td>
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<td>29. C. marianus</td>
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<td>30. C. pseudanalis</td>
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<td>31. C. trukensis</td>
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<td>Philotarsidae</td>
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<td>32. Aaroniella gressitti</td>
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<td>33. A. trukensis</td>
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<td>34. Haplophallus boninensis</td>
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<td>35. H. fuscistigma</td>
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<td>Lachesillidae</td>
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<td>36. Lachesilla pedicularia (L.)</td>
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<td>Ectopsocidae</td>
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<td>37. Ectopsocopsis cryptomeriae (End.)</td>
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<td>38. Ectopsocus brigssi McL.</td>
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<td>39. E. fullawayi End.</td>
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<td>40. E. maindroni Bad.</td>
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<td>41. E. pumilis (Banks)</td>
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<td>42. E. waterstradtii (End.)</td>
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<td>43. E. boharti T. and W.</td>
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<td>44. E. denervus T. and W.</td>
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<td>45. E. fenestratus T. and W.</td>
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<td>Rotini</td>
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<td>56. P. pauliani Bad.</td>
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<td>57. P. suffitus End.</td>
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<td>59. H. roseus Hagen</td>
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<td>60. Heterocaecilius adamsi</td>
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<td>61. H. campanula L. and T.</td>
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<td>62. H. dybasi L. and T.</td>
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<td>63. H. minotus L. and T.</td>
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<td>64. Lobocaecilius cynara L. and T.</td>
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<td>65. L. fennecus L. and T.</td>
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<td>66. Pseudocaecilius criniger (Perkins)</td>
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<td>67. P. marshalli Karny</td>
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<td>69. Pseudoscotticella ornatus (Banks)</td>
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<td>78. Archipsocus dybasi</td>
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<td></td>
</tr>
<tr>
<td>Fiji, Samoa, Hawaii</td>
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<tr>
<td>Africa, Malaya, Hong Kong, Philippines, Galapagos</td>
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</tr>
<tr>
<td>New Guinea</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Ceylon, Vietnam, Borneo, Hong Kong, Java, Philippines, Taiwan, Japan, Amami I., Hawaii</td>
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<tr>
<td>Ceylon, Thailand, Philippines, Hawaii, Central America, West Indies</td>
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<td>Widespread</td>
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<tr>
<td>Society I.</td>
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</tbody>
</table>
Table 1. Distribution of Micronesian Psocoptera

<table>
<thead>
<tr>
<th>Micronesian Island Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonin</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>79. A. spinosus</td>
</tr>
</tbody>
</table>

**Myopscicidae**

60. Lophopterygella cincticornis  
61. Myopsocus bakeri Banks  
62. M. clinius  
63. M. palauensis  
64. M. punctatus

**Psocidae**

85. Ptycta angulata  
86. P. maculata  
87. P. marianensis  
88. P. micromaculata  
89. P. nitens  
90. P. parvula

| | Bonin | Volcanos | N. Marianas | S. Marianas | Palau | Yap | Caroline-Asiatic | Truk | Ponape | Kosrae | Marshall | Gilberts | Wake | Ocean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | 8 | 2 | 5 | 4 | 25 | 14 | 9 | 14 | 15 | 16 | 8 | 1 | 1 |
| ENDEMIC | 2 | 0 | 1 | 9 | 3 | 1 | 1 | 5 | 3 | 1 | 0 | 0 | 0 |
| % Endemism | 25 | 0 | 3 | 5 | 32 | 7 | 11 | 36 | 19 | 8 | 0 | 0 | 0 |

though more significant than that of number of species on elevation, is not significant at the 5% probability level.

The Bonin Islands have 4 of their 8 species widespread in Micronesia, and have 4 species in common with each of the S. Marianas and Palau, 2 with Yap. Two species are endemic to the Bonins, and 1, which has Oriental affinities, is restricted to the Bonins and Volcanos; of the remainder, 2 are cosmopolitan, 2 have distributions restricted to the Pacific, and 1 occurs in New Guinea, Fiji and Samoa.

The Volcanos have but 2 species represented in the collections, one of which has a widespread distribution, the other occurring also only in the Bonins.

The Northern Marianas have 5 species, all of which are widespread in Micronesia. Two of these have wide Pacific distributions, and 1 is practically tropicopolitan.
Table 2. Psocoptera fauna of various islands and island groups

<table>
<thead>
<tr>
<th></th>
<th>Genera</th>
<th>Species</th>
<th>Average no. of species/genus</th>
</tr>
</thead>
<tbody>
<tr>
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<td>68</td>
<td>1.9</td>
</tr>
<tr>
<td>Taiwan</td>
<td>36</td>
<td>70</td>
<td>1.9</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>40</td>
<td>91</td>
<td>2.3</td>
</tr>
<tr>
<td>Philippines</td>
<td>28</td>
<td>70</td>
<td>2.5</td>
</tr>
<tr>
<td>Japan</td>
<td>47</td>
<td>125</td>
<td>2.7</td>
</tr>
<tr>
<td>Galapagos</td>
<td>16</td>
<td>32</td>
<td>1.8*</td>
</tr>
<tr>
<td>Micronesia</td>
<td>25</td>
<td>90</td>
<td>3.6</td>
</tr>
<tr>
<td>Madagascar</td>
<td>35</td>
<td>168</td>
<td>4.8**</td>
</tr>
<tr>
<td>Hawaiian Islands</td>
<td>23</td>
<td>258</td>
<td>11.2***</td>
</tr>
</tbody>
</table>

*Distinct island sub-populations of some of these species are recognizable.

**Badonnel, in litt.

***This figure is 2.2 if only the non-endemic fauna is considered, and 72.0 if only the endemic fauna is considered.

Table 3. Number of species of Psocoptera and endemism on island groups of Micronesia

<table>
<thead>
<tr>
<th>Island group</th>
<th>No. of species</th>
<th>No. of endemics</th>
<th>% of endemism</th>
</tr>
</thead>
<tbody>
<tr>
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<td>8</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Volcanos</td>
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</tr>
<tr>
<td>N. Marianas</td>
<td>5</td>
<td>0</td>
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</tr>
<tr>
<td>S. Marianas</td>
<td>54</td>
<td>19</td>
<td>35%</td>
</tr>
<tr>
<td>Palau</td>
<td>25</td>
<td>8</td>
<td>32%</td>
</tr>
<tr>
<td>Yap</td>
<td>14</td>
<td>1</td>
<td>7%</td>
</tr>
<tr>
<td>Caroline Atolls</td>
<td>9</td>
<td>1</td>
<td>11%</td>
</tr>
<tr>
<td>Truk</td>
<td>14</td>
<td>5</td>
<td>36%</td>
</tr>
<tr>
<td>Ponape</td>
<td>16</td>
<td>3</td>
<td>19%</td>
</tr>
<tr>
<td>Kusaie</td>
<td>13</td>
<td>1</td>
<td>8%</td>
</tr>
<tr>
<td>Marshalls</td>
<td>16</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td>Gilberts</td>
<td>8</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td>Wake</td>
<td>1</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td>Ocean</td>
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<td>0</td>
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</tr>
</tbody>
</table>

Of the 54 species from the Southern Marianas, 15 are widespread in Micronesia. Ten species are practically cosmopolitan, 8 are found elsewhere only in the Pacific, 7 occur in the Oriental region and 3 in New Guinea. Within Micronesia, the greatest overlap in species is with the Marshall Islands, 12 of the species widespread in Micronesia occurring in both groups. Apparently 19 species are endemic to the S. Marianas, this island group thus having the second highest percentage endemism in Micronesia (Table 3).
Figure 1.—Relationship between the Psocopteran fauna of Micronesian islands and their elevation and land area. B = Bonins, G = Gilberts, K = Kusiae, M = Marshall, NM = Northern Marianas, PA = Palau, PO = Ponape, SM = Southern Marianas, T = Truk, V = Volcanos, Y = Yap.
The 25 species from Palau include 4 cosmopolitan, 2 found elsewhere only in the Pacific, 2 occurring in the Oriental region, and 2 in New Guinea. Ten species are widespread in Micronesia, and 8 are apparently endemic to Palau. There are 9 species in common with Yap, 8 with Ponape, and 8 with the S. Marianas.

Yap has 14 species represented in the collections, 9 of which also occur in Palau. Apparently only 1 species is endemic to Yap. There are no New Guinea species present, but 3 occur in the Oriental region, and 2 elsewhere only in the Pacific. Three species are cosmopolitan. Of the 14 species, 11 are widespread in Micronesia.

All but one of the 9 species from the atolls of the Carolines are widespread in Micronesia. The exceptional species has an interesting distribution, occurring on Tobi, Sonsorol, Ulithi, Sorol and Woleai atolls, but never having been collected from any of the high island groups, including Palau and Yap. This is evidently a true atoll form, which possibly cannot survive the competition existing on high islands.

Truk shows a fairly high degree of endemism, 5 of its 14 species being endemic. Of the remainder, 8 are widespread in Micronesia. Truk has most species in common with Ponape (6) and Kusaie (6). Two species are found in the Oriental region, and 2 elsewhere only in the Pacific.

Ponape, has 3 of its 16 species endemic; 13 are widespread in Micronesia, 8 of these also occurring in Palau. There are 8 species common to Ponape and Kusaie. There are 2 cosmopolitan species, 2 found elsewhere only in the Pacific, and 2 which occur in the Oriental region.

Of the 13 species from Kusaie, 12 are widespread in Micronesia and 1 is endemic. The greatest species overlaps are with the Marshalls (9), Ponape (8), and the S. Marianas (9). There are 3 purely Pacific species present on Kusaie, 3 which occur in the Oriental region, and 1 which is cosmopolitan.

All but one of the 16 species from the Marshall Islands are widespread in Micronesia, the remaining species also occurring in the Gilberts. There are 4 purely Pacific species, 3 cosmopolitan, and 3 which occur in the Oriental region and the Pacific. The greatest species overlaps are with the S. Marianas (12) and Kusaie (9).

Only 8 species have been collected from the Gilbert Islands, 6 of these being widespread in Micronesia, 1 occurring also in the Marshalls, and 1 occurring also on Ocean Island. These include cosmopolitan species (2), Oriental and Pacific species (2) and Pacific species (1). The greatest species overlap (5) is with the Marshalls.

A widespread Pacific species, Ectopsocus fallawayi, evidently occurs only on Wake Island in Micronesia.
Endemism is thus highest (Table 3) on Truk, Palau and the Southern Marianas. Yap and Kusaie, which have faunas of sizes similar to that of Truk, show relatively little endemism, whilst Ponape shows a moderate degree. There is moderate endemism in the Bonins, but apparently none in the N. Marianas, which are younger and have a poorer fauna than the S. Marianas, nor in the Marshalls or Gilberts, which are very low and very young.

Oriental species occur on all the island groups except the Bonins and N. Marianas, making up about 15% of the fauna of each group, but New Guinea species occur only on Palau (1), S. Marianas (3) and Bonins (1). The New Guinea fauna, however, is very poorly known.

The philotarsid genus *Haplothallus* is represented by two species, one endemic to the Bonins, and one to the S. Marianas; the genus has not invaded the Caroline chain. Other known species of the genus occur in S. China, the Seychelles, Africa and Tasmania. On the other hand, the two species of the related genus *Aarontella*, which are closely related to *A. guttulata* (Banks) from the Philippines, occur only in the Carolines, one occurring on all the high island groups except Truk, the other on Truk alone. Thus within the family there seems to be species replacement in the Bonins, Marianas and Carolines; the family apparently has not successfully invaded the Marshalls or Gilberts. A similar situation is suggested by the distribution of the two species of *Hemipscocus*, one occurring only on Palau and Ponape, the other occurring elsewhere in the Carolines and in the S. Marianas and Marshalls, but being absent from Palau and Ponape. Species replacement in Micronesia is also evident within the *hirsutus* group of *Ectopsocus*: in the Bonins only *E. boharti* has been collected, in the Marianas only *E. thyssanus*, and in the Carolines and Marshalls only *E. villosum* (see also Thornton and Wong, 1968).

The greatest amount of speciation appears to have been in the Pseudocaeciliidae, there being 15 species known only from Micronesia. Of the genus *Pseudoscottiella*, 8 species are apparently confined to the Carolines, with the greatest representation on Palau (5 species).

There has also probably been considerable speciation in the Lepidopsocidae, 3 species of *Echmepteryx*, 2 of *Lepidopsocus* and *Nepticulomima* being unknown outside Micronesia. Two of the species of *Lepidopsocus* have reached Hawaii, whereas a third, very widely distributed in Micronesia, has apparently not done so. A fourth species is confined, so far as is known, to the S. Marianas. Three of the 5 species of *Echmepteryx* are confined to the S. Marianas, the remaining 2 occurring also in Hawaii (1 is tropicopolitan). *Nepticulomima* is represented by 2 species, one confined to the S. Marianas, the other to Yap and Palau.

Of the 12 species of *Caecilius*, 9 are known only from Micronesia; 3 of
these are apparently endemic to the S. Marianas, 2 to Truk, 1 to Palau, 1 is found only on Palau and Yap, and 1 only on low west central Caroline islands and atolls.

The Ectopsocidae (along with the Pseudocaeciliidae) is the most richly represented family in Micronesia, with 18 species. However, only 4 of these are confined to the S. Marianas, 1 to the Bonins, 1 to Truk, 1 to Kusaie and 1 occurs on Truk, Ponape and Kusaie and in the Marshalls. Of the remainder, 4 are practically cosmopolitan, 3 are purely Pacific forms, 1 occurs in New Guinea and 2 in the Philippines.

The Myopsocidae of Micronesia have Australian (2) African (1) and Oriental (1) affinities.

The six species of the Psocidae are placed in the genus *Ptycta*, which has undergone explosive evolution on the Hawaiian archipelago and which has a species in South China, another in the Ryukyus, and representatives in Madagascar, New Guinea, Fiji, Samoa, South America and the Galapagos archipelago. Related forms occur in the Seychelles. Some of the Micronesian species appear to be related to one group of Hawaiian forms.

It is of interest to examine the species overlap within island groups in Micronesia. Table 4 shows the number of species in common between the island groups and this is converted into a % overlap in Table 5, to correct for the faunal size of each island group considered. In Table 6, this is further corrected, to take into account the faunal size of each member of the pair of groups under consideration, the percentage overlap of the total fauna of both groups (species in common being counted only once) being calculated. The high concordances between Palau and Yap, Ponape and Kusaie, Kusaie and the Marshalls, and the Marshalls and Gilberts, are not surprising. The high concordance between the S. Marianas and the Marshalls is chiefly due to species widespread in Micronesia occurring on both archipelagos and does not indicate any peculiar faunal affinity between the two groups of islands. It is interesting to note that Truk has more in common with Ponape and Kusaie than with Yap and Palau.

The Micronesian psocid fauna is rich in species but not in genera, suggesting that there has been more speciation than in continental islands, but less than that recently found to have occurred in Madagascar or Hawaii. Speciation has evidently been greatest in the Pseudocaeciliidae, Caeciliidae, Lepidopsocidae and Psocidae, although the Ectopsocidae is one of the most richly represented families. Endemism is highest in the S. Marianas, Palau and Truk.

The Psocidae show some affinities with the Hawaiian fauna and Micronesia may have been a route for the spread of *Ptycta* to Hawaii, where it has under-
Table 4. Number of psocid species in common for pairs of island groups in Micronesia

<table>
<thead>
<tr>
<th></th>
<th>Bonins</th>
<th>Volcanos</th>
<th>N. Marianas</th>
<th>S. Marianas</th>
<th>Palau</th>
<th>Yap</th>
<th>Truk</th>
<th>Ponape</th>
<th>Kusaie</th>
<th>Marshalls</th>
<th>Gilberts</th>
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<tbody>
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<td>4</td>
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</tr>
</tbody>
</table>
Table 5. Percentage overlap of psocid fauna of island groups of Micronesia

<table>
<thead>
<tr>
<th>% Bonins fauna (8 spp.) on</th>
<th>% Volcanos fauna (2 spp.) on</th>
<th>% N. Marianas fauna (5 spp.) on</th>
<th>% S. Marianas fauna (54 spp.) on</th>
<th>% Palau fauna (25 spp.) on</th>
<th>% Yap fauna (14 spp.) on</th>
<th>% Truk fauna (14 spp.) on</th>
<th>% Ponape fauna (16 spp.) on</th>
<th>% Kusaie fauna (13 spp.) on</th>
<th>% Marshalls fauna (16 spp.) on</th>
<th>% Gilberts fauna (8 spp.) on</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonins</td>
<td>Volcanos</td>
<td>N. Marianas</td>
<td>S. Marianas</td>
<td>Palau</td>
<td>Yap</td>
<td>Truk</td>
<td>Ponape</td>
<td>Kusaie</td>
<td>Marshalls</td>
<td>Gilberts</td>
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<td>63</td>
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Table 6. Percentage of psocid fauna of pairs of island groups which is common to both groups

<table>
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<tr>
<th></th>
<th>Bonins</th>
<th>Volcanos</th>
<th>N. Marianas</th>
<th>S. Marianas</th>
<th>Palau</th>
<th>Yap</th>
<th>Truk</th>
<th>Ponape</th>
<th>Kusaie</th>
<th>Marshall</th>
<th>Gilberts</th>
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</table>
gone considerable speciation to form a large endemic complex. There is no evidence at all that Micronesia has been a route for the spread of the other very large Hawaiian endemic complex, the family Elipsocidae not having been found in Micronesia.

SYSTEMATICS

The fauna is divided among 14 families as follows (including Banks' acceptable records):

<table>
<thead>
<tr>
<th>Family</th>
<th>Genera</th>
<th>Species</th>
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<tr>
<td>Lepidopsocidae</td>
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<td>Pseudocaeciliidae</td>
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<tr>
<td>Psocidae</td>
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</tr>
</tbody>
</table>

**25**  **90**

**KEY TO MICRONESIAN FAMILIES OF PSOCOPTERA**

1. Antenna with more than 20 segments; tarsi of adults 3-segmented; pterostigma absent or not thickened; paraproct with strong posterior spine......................2
   Antenna with 17 or fewer segments; tarsi of adults 2 or 3-segmented; pterostigma present, thickened or not; paraproct without posterior spine......................4

2. Head short, broad; inner face of second segment of maxillary palp with peg-like sensillum; fore wing without a nodulus; body and wings sometimes with scales........3
   Head long; inner face of second segment of maxillary palp without sensillum; fore wing with nodulus; scales absent........................................PSYLLIPSOCIDAE

3. Body and wings with scales, claws with preapical tooth..............LEPIDOPSOCIDAE
   Body and wings without scales, claws without preapical tooth.......PSQUILLIDAE

4. Antenna with 15 or more segments; fore wing without nodulus...PACHYROCTIDAE
   Antenna with 13 segments; forewing with nodulus............................5

5. Labial palps broadly triangular, laterally diverging; female gonapophyses usually reduced, lacking a definite outer valve; lacinia narrowing apically, usually without diverging teeth.............................................................CAECILIIDAE
   Labial palps short, almost semi-circular, adpressed; female gonapophyses usually with well developed outer valve; lacinia not narrowing apically, usually toothed.......6
6. Forewing with discoidal cell closed (areola postica joined to media); if brachypterous, then glandular setae present on head........................................7
   Forewing with discoidal cell open (areola postica free or absent); brachypterous or apterous forms lack glandular setae.................................................................8
7. Tarsi 3-segmented........................................................................MYOPSOCIDAE
   Tarsi 2-segmented.........................................................................9
8. Vein m of fore wing 2-branched................................................HEMIPSOCIDAE
   Vein m of fore wing 3-branched................................................PSOCIDAE
9. Tarsi 3-segmented........................................................................PHILOTARSIDAE
   Tarsi 2-segmented........................................................................10
10. Forewing without areola postica (if female brachypterous, wings are glabrous and genitalia complete)..................................................................................................11
11. Forewing with areola postica (if female brachypterous, wings are setose and only one pair of gonapophyses is present).......................................................12
11. In hindwing, s and m connected by a crossvein; claws without preapical tooth ....................ECTOPSISOCIDAE
   In hindwing, s and m fused for a length; claws with preapical tooth...PERIPSOCIDAE
12. Forewing with veins and margin glabrous....................................LACHESILLIDAE
13. Forewing veins indistinct, membrane strongly setose; female genitalia reduced................ARCHIPSOCIDAE
13. Forewing veins distinct, membrane not setose; female genitalia complete..................PSEUDOCACILIIDAE

**Family LEPIDOPSOCIDAE** Pearman, 1936

CHARACTERISTICS: Forewing lacking nodulus, pterostigma not thickened; wings, body and legs usually covered with scales; antennae with more than 20 segments, not ringed; tarsi 3-segmented; maxillary palp with peg-like sensillum on mesial surface of second segment.

The genera in this family are not well-defined. We have followed Roesler (1944) in placing the following species.

**Key to Micronesian Genera of Lepidopsocidae**

1. Forewing elytriform, veins unrecognizable........................................Cytophania
   Veins of forewing distinct..............................................................2
2. Antenna with fewer than 30 segments, segments about four times as long as thick;
   both fore and hindwing with distinct closed cell, that of hind wing narrow, basal........3
   Antenna with 30 or more segments, segments about twice as long as thick; distinct
   closed cell never present in both fore and hindwing..........................4
3. Forewing rounded apically, vein sc not interrupted...........................Soa
   Forewing acuminate, vein sc interrupted....................................Nepticulomima
4. In forewing veins rs and r1 separate or linked by a crossvein..............Echmepteryx
   In forewing veins rs and r1 fused for a distance................................Lepidopsocus

**Genus Cytophania** Banks

1. **Cryptophania marginata** Thornton, Lee & Chui, n. sp. (fig. 2, a,g,l)

**Female:** Coloration (after c. 7 years in alcohol). Head brown, darker on frons. Thorax pale brown. Legs pale brown, coxa and tibia somewhat darker than other segments except tibia apically pale. Forewing (fig. 2, a) brown, darker along anterior margin, in region of apex and along posterior margin apically; three prominent paler areas along posterior half of anterior margin, five pale areas adjacent to posterior margin, a number of paler streaks in middle of wing. Hindwings lacking, represented by minute scales. Abdomen pale brown.

![Diagram of Cryptophania marginata](image)

**Figure 2:** Forewing: a, *Cryptophania marginata*; b, *Echmepteryx dybasi*; c, *E. picticeps*; e, *E. carolinensis*; hindwing: d, *E. picticeps*; f, *E. carolinensis*; forewing scales: g, *C. marginata*; h, *E. carolinensis*; female genitalia: i, *C. marginata*; j, *E. picticeps*; k, *E. dybasi*; l, *E. carolinensis*. Scales a-f = 0.3 mm; g-h = 0.1 mm; i-l = 0.2 mm.
Morphology. I.O.: D. = 6.0: 1. Ocelli absent. Maxillary palp second segment from base with two subapical spines and basal sensillum. Venation of fore wing very indistinct, wing elytron-like, with hairs and symmetrical scales (fig. 2, g). No stenodiobothria on hind tarsal segments. Pearman's organ consisting of rasp only. Gonapophyses and subgenital plate as in figure 2i. Paraaprocts each with two trichobothria in rosette sockets and long slightly curved mesial spine. No abdominal scales found.

Body length (in alcohol): 1.5 mm (average of 10 specimens, range 1.0-2.0 mm).

Male: Unknown.


DISTRIBUTION: S. Mariana Is. (Saipan, Tinian, Guam), Marshall Is. (Jaluit, Eniwetok), Fiji, Samoa, Mangareva, Fanning.

Differs from the Hawaiian species in details of forewing pattern, and head markings. We have examined specimens in the Bishop Museum collection from Fiji, Samoa, the Mangareva Islands and Fanning Island.

Genus **Echmepteryx** Aaron


**KEY TO MICRONESIAN SPECIES OF ECHMEPTERYX**

1. Along whole length of forewing an obvious median, wide dark brown longitudinal band, discernible with scales intact and on membrane with scales removed

   Forewing not marked as above ........................................ 3. *madagascariensis*

2. Forewing short, broad, bluntly pointed; hindwing reduced

   Forewing lanceolate; hindwing normal ................................ 5. *dybasi*

3. Membrane of forewing of uniform pale color or hyaline

   Membrane of forewing with vague fuscous markings .................. 6. *carolinensis*

4. Across front of head a narrow, curved brown band below ocelli and second similar band between antennal sockets ........................................ 2. *Iunulata*

   Head with complex pattern of dark brown ............................ 4. *picticeps*

2. **Echmepteryx (Thylacopsis) Iunulata** Thornton, Lee & Chui, n. sp. (fig. 3, n-p)

   **Female**: Coloration (freshly killed, in alcohol). Head and body pale yellowish cream. Very pale reddish brown mark each side of median epicranial suture, lunulate transverse mark across frons anterior to ocelli, lacking an adjacent median circle posterior to it; a reddish
Thornton, Lee & Chui—Psocoptera

brown band from orbit to antennal socket, continuing to fronto-sclpeal suture and extending along it mesially, but not extending along scape. Clypeus with a similar colored band along anterior border, labrum with a mark on each side. Eyes black; ocelli pale, bordered dark reddish brown along inner margins. Maxillary palps and antennae pale yellowish cream. Thorax yellowish cream, except each side a dark brown pleural stripe above coxae. Legs pale, two pale brown bands on tibia, basal segment of tarsus darker basally. Wing membrane hyaline (fig. 3, n). Abdomen cream.


Body length (in alcohol): 1.4–2.0 mm (10 specimens: average 1.73 mm).

MALE: Unknown.

Nymphs: Recognizable on head pattern.


This species differs from *E. (Thylacopsis) madagascariensis* in lacking the dark longitudinal fascia on the forewing membrane, in head pattern (distinguishable in the nymph), as well as in the possession of a distinct crossvein between r₁ and r₅ in the forewing, and a dark thoracic pleural stripe.

It differs from *Thylacopsis falco* Bad. in details of head markings (e.g. no median clypeal mark), from *E. similis* Bad. in that the wing membrane is hyaline and in details of the head markings, and from *E. pallida* Smithers, which it most closely resembles, in fine details of the head markings. It is clearly very closely related to the latter Australian species.

3. **Echmepteryx (Thylacopsis) madagascariensis** (Kolbe) NEW COMBINATION.


**DISTRIBUTION:** West Africa, Madagascar, Seychelles, Hong Kong, Kermadec, Hawaii, Chile, possibly also eastern Central America, northeast S. America, West Indies (see Thornton, 1966), Bonin Is. (Chichi Jima), N. Mariana Is. (Anatahan), S. Mariana Is. (Saipan).

**BONIN IS. CHICHI JIMA**: Jul. 1951, R.M. Bohart.


S. MARIANA IS. SAIPAN: Tuturam, Laulau Bay, beating, Jan. 1945; SW, May, 1945; As Mahetog area, sifted from *Pandanus* fruit, Mar. 1945; Sadog Talofofo, *Pandanus*, Mar. 1945; As Mahetog area, decaying crown of *Pandanus*, Mar. 1945; Papago area, beating, Jan., 1945, all by Dybas.

4. **Echmepteryx (Thylacopsis) picticeps** Thornton, Lee & Chui, n. sp. (fig. 2, c, d, j; 4, c,e)

**FEMALE:** Coloration (after c. 20 years alcohol storage). Head generally buff, patterned with dark brown; a dark brown band from orbit to antennal socket, and a dark brown spot mesial to orbit on posterior surface of vertex. Eyes black; ocelli pale, with dark brown margins. Maxillary palp and ocelli pale buff. Thorax buff, except a granulated dark brown longitudinal mark extending over cervicium and pro- and meso-thoracic pleura. Legs buff, except a brown band near basal end of hind tibia. Wing membranes pale buff. Abdomen cream, a pair of dark brown spots apically.

**Morphology.** I.O.: D. = 6.1: 1. Occipital and frontal sutures ill-defined. Vertex, frons, and clypeus laterally with close-set long narrow curving scales. Maxillary palp with basal sensillum on second segment, apical segment (fig. 4, c) very broad and short. Venation of wings
as in fig. 2, c, d. Number of ctenidiobiorthia on hind tarsal segments: 13; 0; 0. Pearman's organ consisting of cross only. Gonopophyses (fig. 2, j) short and broad. Paraprocts each with a group of 5 trichobiorthia with rosette sockets and 1 without; long curved posterior spine. Abdominal scales (fig. 4, e) symmetrical.

Body length (in alcohol): 1.6 mm (average of 8 specimens, range 1.1–1.9 mm).

**MALE:** Unknown.


**DISTRIBUTION:** S. Mariana Is. (Saipan, Tinian).

5. **Echmepteryx dybasi** Thornton, Lee & Chui, n. sp. (fig. 2, b, k; 4, d, g)

**FEMALE:** Coloration (after c. 20 years alcohol storage). Head buff, patterned with brown (fig. 4, g); a brown band from orbit to brown pigment surrounding antennal socket, an oblique brown band parallel to this, also reaching antennal socket pigment, on gena. Eyes black, ocelli absent. Maxillary palps and antennae pale buff. Thoracic terga and pleura creamy-buff, dark brown granulated longitudinal band from orbit posteriorly over cervicium and upper part of pleura. Legs uniform creamy-buff. Forewing membrane (scales lost) light brown, a slightly paler area distal to apex of an (fig. 2, b). Abdomen pale cream, transverse grey-brown banding evident laterally.

Morphology. I.O.: D = 6.0: 1. Ocelli lacking. Occipital and frontal sutures well-defined. Vertex, frons and sides of clypeus with long, curving, narrow scales. Maxillary palp (fig. 4, d) second segment with stout subapical setae and basal sensillum. Forewing venation as in fig. 2, b, with long fine hairs and narrow scales. Hindwing reduced. Pearman's organ consisting of cross only. Number of ctenidiobiorthia on hind tarsal segments: 13; 1; 0. Genitalia as in fig. 2, k. Paraprocts each with a row of 4 trichobiorthia and a long posterior spine.

Body length (in alcohol): 1.3 mm (average of 7 specimens, range 0.8–1.8 mm).

**MALE:** Unknown.


**DISTRIBUTION:** S. Mariana Is. (Saipan).

This species will not run to any of the genera keyed by Roesler (1944). It resembles *Echmepteryx terriculis* Bad. in venation (rs 2-branched, fused to m which is 3-branched) and in the reduction of the hindwing and lack of ocelli. The resemblance in head pattern to an undescribed species of *Lepolepis* from Hawaii, and to *Pteroxanion kelloggi* (Ribaga) is quite marked, but the wing scales are quite different from those of the Hawaiian *Lepolepis*. The generic criteria in the Lepidopscocinae are at present unsatisfactory, and until a revision is made it seems prudent to place this species in *Echmepteryx* Aaron s.l. (see discussion by Badonnel, 1963, Biologie de l'Amerique Australe 2: 298).

6. **Echmepteryx (Thylacopsis) carolinensis** Thornton, Lee & Chui, n. sp. (fig. 2, e, f, h, l)

**FEMALE:** Coloration (after c. 16 years alcohol storage). Color of body not discernible,
except legs: femur darker apically, tibia with two broad brown bands, tarsus darker basally. Forewing membrane with fuscous markings, hindwing membrane pale brown, veins brown.

Morphology. I.O.: D. = 5.5: 1, ocelli wide-set, lateral ocelli about midway between orbital margin and sagittal suture. Venation of wings as in fig. 2, e, f. Membrane liberally clothed with hairs and asymmetrical scales (fig. 2, h). Number of ctinidiobothria on hind tarsal segments: 15; 0; 0. Pearman’s organ consisting of rasp only. Subgenital plate distinct, small, setose (fig. 2, l). Gonapophyses (fig. 2, l) elongate. Paraprocts each with 6 trichobothria set in rosette sockets and long mesial spine. Abdominal scales lost.

Body length (in alcohol): 1.6 mm (average of 5 specimens, range 1.2–2.0 mm).

MALE: Unknown.


DISTRIBUTION: Caroline Is. (Palau, Yap, Truk, Ponape).

Genus Lepidopsocus Enderlein


KEY TO MICRONESIAN SPECIES OF LEPIDOPSOCUS

1. Forewing membrane hyaline; head cream, unmarked.................................10. pallidus

2. Central area of forewing membrane hyaline; clypeus with marginal brown band, a median dark band distally, and a pair of circular brown patches...........9. pretiosus

3. Vertex with a pair of wedge-shaped brown patches; forewing membrane with broad transverse band midway along its length, and separate small fuscous patch near wing apex .........................................................8. marmoratus

4. Vertex with a pair of rounded brown patches; most of forewing membrane fuscous, no separate distal fuscous patch.........................................................7. maculatus

7. Lepidopsocus maculatus Thornton, Lee & Chui, n. sp. (fig. 3, j–m)


Morphology. I.O.: D. = 5.8: 1. Thoracic terga waxy. Basal hind tarsal segment with 16 ctinidiobothria, claws with small preapical tooth, Pearman’s organ present. Fore and hindwings pointed, venation as in figure 3, j, k. Forewing scales of three types. Scales on
underside of abdomen of two types, symmetrical. Epiproct simple, rounded posteriorly, sparsely setose; paraprocts simple, with six trichobothria in rosette sockets. Subgenital plate simple, setose. Gonapophyses (fig. 3, l), narrow median pouch for spermapore (fig. 3, m).

Body length (in alcohol): 1.6–2.0 mm (10 specimens, average 1.8 mm).

Male: Unknown.

Nymphs: Recognizable on head pattern.
Lepidopscocus marmoratus (Banks)
DISTRIBUTION: Hawaii, S. Mariana Is. (Saipan, Tinian).

Lepidopscocus pretiosus (Banks) NEW COMBINATION (fig. 3, a–e; 4, h)
N. MARIANA IS. PAGAN: Regusa-Tarangue, Apr. 1940, Yasumatsu and Yoshimura.
S. MARIANA IS. SAIPAN: Apr. 1951; Kalabera area, Jan. 1945; As Mahetog area, Jan. 1945; Halaihais-Toe area, beating, Jan. 1945; Tuturam, Laulau Bay, beating, Jan. 1945; Achugau area, beating, Dec. 1944; Chalan Laulau area, beating, Jan. 1945; Pidos Kalaha (Mt. Magpi) summit, Apr. 1945; near Garapan, beating, Jan. 1945; As Mahetog area, in dead Papaya stump, May 1945; Talofono ridge, beating, Jan. 1945; hills E. of Garapan, beating, Jan. 1945; Chalan Laulau area, under boards, Jan. 1945; Papago area, beating, Jan. 1945; Laulau Bay, beating mango, Dec. 1944; Sadog Talofono, beating, Feb. 1945; Mt. Tagpochoau, 400 m, Feb. 1945; As Mahetog area, beating, Jan. 1945; all by Dybas. TINIAN: Mar. 1945; Tinian Harbor, Mar. 1945; NW slope Mt. Lasso, Mar. 1945; Marpo Valley, Apr. 1945; Lake Hagoi, beating, Apr. 1945; NE slope Mt. Lasso, Apr. 1945; ridge, SE section, beating, Mar. 1945; Tinian Harbor, on dead Poinciana,
Mar. 1945; N. of Gurgan Point, Apr. 1945; all by Dybas. Guam: Fadang, in
dry fibrous core of Pandanus fruit, Apr. 1945, Dybas; Mt. Alifan, Apr. 1946,
Krauss; Pt. Oca, May 1945, Gressitt (Plesiotype); Yigo, Feb. 1950, Krauss.
YAP. Map I., coconut palm, Aug. 1950, Goss.
CAROLINE ATOLLS. Pingelap: Jan. 1953, Gressitt.
KUSAIE. Malem R., 90 m, beating, Mar. 1953, Clarke.
MARSHALL IS. JALUIT: Jabor I., May 1958, Gressitt; Pinlep I., Apr.

One of us (I.W.B.T.) has examined paratype No. 23830 in the Museum
of Comparative Zoology at Harvard, and we give a drawing of the head
pattern (fig. 4, h). The forewing venation drawn by Banks does not agree with
that of any of the specimens we have examined, and we thus provide drawings
of venation and membrane pattern of a specimen from the type locality (Guam)
(fig. 3, a–c). There is a closed narrow cell near the base of vein r in the hind
wing, as drawn by Banks.

The species is widespread in Micronesia and is clearly related to L. maculatus
and L. marmoratus, both of which have reached Hawaii.

10. Lepidopsocus pallidus Thornton, Lee and Chui, n. sp. (fig. 3, d, e; 4, f)

Female: Coloration (afer c. 20 years alcohol storage). Head, abdomen dorsally, cream.
Thorax, including legs, and ventral surface of abdomen pale brown. Eyes black, ocelli pale.

Morphology. I.O.: D. = 6.5: 1. Venation of wings as in fig. 3, d, e. Number of stenidio-
bothria on hind tarsal segments: 12; 1; 0. Pearson’s organ consisting of rasp only. Gona-
pophyses long, with long setae. Paraprocts each with a field of 8 trichose bothria in rosette sockets
and one without, posterior spine fairly short, curved. Abdominal scales (fig. 4, f) lanceolate,
symmetrical, of two types.

Body length (in alcohol): 1.5 mm.

Male: Unknown.

Holotype, ♀ (FM), Mariana Is., Saipan, As Mahetog area, beating, Jan.
20, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Saipan).

Genus Nepticulomima Enderlein

Nepticulomima Enderlein, 1906, Spolia Zeylan. 4: 95.

Key to Micronesian Species of Nepticulomima

Forewing membrane with prominent groups of sockets at ends of veins and along vein
r, sockets also distributed over costal area basally.................. 11. bothriata
Forewing with sockets restricted to costal area basally.......................... 12. lineatus

11. Nepticulomima bothriata Thornton, Lee and Chui, n. sp. (fig. 3, f, g; 4a)

Female: Coloration (after c. 13 years dry storage). No distinguishable head pattern

Morphology. I.O.: D. = 4.5: 1, ocelli wide apart, lateral ocelli nearer to orbit margin than saggital suture. Venation as in fig. 3, f, g. Forewing with patches of large sockets at ends
of veins and along vein r, these sockets otherwise restricted to costal area. Hindwing in anal and costal area with minute rod-like microtrichiae, giving the membrane a slightly greyish appearance. Basal hind tarsal segment with 20 ctenidiothoridia, apical segments without any. Pearman's organ consists of raps only. Subgenital plate small, simple. Gonapophyses (fig. 4, a) short, squat, setose. Paraprocts each with six trichobothria with rosette sockets and one without, a long straight spine. Abdominal scales lost.

Body length (in alcohol): 2.1 mm (average of 5 specimens, range 1.7–2.3 mm).

Male: Unknown.


DISTRIBUTION: Caroline Is. (Palau, Yap).

This large species lacks the anteriorly directed crossvein on vein r in the forewing, which is found in N. lineatus (below) but agrees in venation otherwise, and in having sockets for macrotrichiae (?) distributed over the costal area basally. It differs in having groups of sockets at the ends of the veins and along vein r.

12. Nepticulomima lineatus Thornton, Lee & Chui, n. sp. (fig. 3, h, i; 4, b)

Female: Coloration (after 20 years alcohol storage). Head generally buff, a pair of faint brown crescentic patches on frons, antennal socket broadly ringed with dark brown, this pigment extending over gena and along lateral margin of clypeus; very narrow brown line from orbit to antennal socket pigment, distinct discreet dark brown patch in middle of gena posterior to antennal socket. Eyes black; ocelli heavily pigmented marginally with dark brown. Antenna buff, two basal segments with grey-brown line on under side; maxillary palp buff, a dark brown line along mesial surface. Thoracic terga creamy buff, a pair of transverse grey-brown marks on prothorax and metathorax. Pleura cream, a wide grey-brown longitudinal band over pro- and mesothoracic pleura. Legs with coxa dark grey-brown otherwise buff apart from grey-brown marks near basal and distal ends of femur and tibia. Forewing membrane with large brown central area, otherwise hyaline. Hindwing membrane hyaline. Abdomen buff.

Morphology. I.O.: D. = 3.0: 1. Occipital, but not frontal suture, distinct. Venation of wings as in fig. 3, h, i. Number of ctenidiothoridia on hind tarsal segments: 16; 1; 0, basal segment tapering distally. Pearman's organ consisting of raps only. Gonapophyses (fig. 4, b) short, broad. Paraprocts each with a group of 6 trichobothria in rosette sockets and 1 without.

Body length (in alcohol): 1.5 mm (average of 5 specimens, range 1.2–1.7 mm).

Male: Unknown.

Nymph: Coloration as female.


Distribution: S. Marianas Is. (Tinian).

Of the two species of this genus found in Micronesia, one is found in the S. Marianas, the other in the W. Carolines, and there is apparently no range overlap.
Genus *Soa* Enderlein


13. **Soa dahliana** Enderlein


**DISTRIBUTION**: Bismarck Archipelago, Guam.

This species was recorded by Banks from Guam, and is not present in the collections before us. It was originally described from the Bismarck Archipelago.

**FAMILY PSOQUILLIDAE** Pearman, 1936

**CHARACTERISTICS**: Ocelli lacking; wings reduced at least to some extent, but with veins, antenna of more than 20 segments, not with scales.

Genus *Rhyopsocus* Hagen


14. **Rhyopsocus pandanicola** Thornton, Lee and Chui, n. sp. (fig. 5, a–e)

**Macropterous form**

**FEMALE**: Coloration (after c. 20 years in alcohol). Head brown. Eyes black; ocelli pale, dark brown along inner margins. Sub-basal segment of maxillary palp pale basally. Scape and pedicle brown, flagellum pale brown. Median epicranial and fronto-clypeal sutures dark brown. Pro- and mesothoracic terga brown, metathoracic terga paler. Pleura brown. Legs brown, tibia apically and tarsus paler brown. Forewings uniform yellowish-brown, except a wide oblique hyaline band near base (fig. 5, a) and a narrow hyaline line along cu1; hindwing much paler, uniform (fig. 5, b). Abdomen pale buff, grey-brown transverse bands dorsally, grey-brown pigment laterally.

Morphology. Scattered hairs on head, eyes bare. Head and pro- and mesothoracic terga shining. Antero-lateral angles of mesothoracic dorsum each produced into a broad, scutellarum distinct. Forewings reaching beyond abdominal apex; anal lobe strongly angulate, posterior wing margin excised a: end of an, venation as in fig. 5, a. Basil hind tarsal segment without ctenidiobothria, Pearman's organ lacking. Subgenital plate (fig. 5, c) simple, setose. Gonapophyses (fig. 5, c) consisting of but a single pair of setose somewhat rectangular valves. Epiproct sharply triangular, with a pair of long setae along each lateral side, a more widely-spaced pair along basal edge. Paraprocts with a drum-shaped apical prominence, and a field of five trichobothria in rosette sockets. No dorsal lobes or prongs on dorsal apex of abdomen.

Body length (in alcohol): 1.0 mm (average of 5 specimens, range 0.9–1.1 mm).

**MALE**: Coloration. As female.

**Morphology**. Eyes as female. Genitalia: Hypandrium simple, straight-edged apically (fig. 5, d), penial sclerites divergent anteriorly (fig. 5, d). No dorsal lobes or prongs on dorsal apex of abdomen.
Body length (in alcohol): 1.0 mm (average of 5 specimens, range 0.8–1.1 mm).

Brachypterous form

As macropterous form in coloration and morphology, except that wings when folded back leave abdominal apex exposed and are rather darker in color (fig. 5, c). Ocelli smaller, only two trichobothria on each paraproct.

Holotype, ♀ (FM), Saipan, Marianas Is., Tagpochau, 375 m, beating Pandanus day-flowering body, Feb. 18, 1945, Dybas. Allotype, ♂ (FM), same data. Paratypes, Saipan: as Mahetog area, Jan. 30, 1945; SW, beating, May 7, 1945; As Mahetog area, sifted from Pandanus fruit, and in decaying crown of Pandanus leaves, Mar. 4, 1945; As Mahetog area, sifting in Pandanus clump, Apr. 22, 1945; near Garapan, beating, Jan. 19, 1945; Mt. Tagpochau, 1 mile NNE of summit, beating, Jan. 18, 1945; all by Dybas. Tinian: NW slope Mt. Lasso, beating, Apr. 1, 1945, Dybas. Guam: Pt. Oca, overripe Pandanus fruit, Jan. 9, 1945, Gressitt and G.E. Bohart. Additional specimen,
Ujae Atoll, Ebeju I., in axils of *Pandanus* leaves, Mar. 8, 1952, Fosberg.

**DISTRIBUTION:** S. Mariana Is. (Saipan, Tinian, Guam), Marshall Is. (Ujae).


This species differs from all other species of the genus except *Rhyopsocus peregrinus* (Pearman, 1929) and *Empheriella denerosa* Enderlein 1912 (redescribed by Enderlein in 1931) which is probably congeneric, in the shape of the anal lobe of the forewing. In this it is closer to *R. peregrinus*, having a distinct excision at the end of the anal vein; moreover, as in *R. peregrinus*, the margin of the anal lobe lacks setae. It differs from *R. peregrinus* in lacking vein *r₁* in the hindwing, even in the macropterous form, and in coloration.

*R. peregrinus* was described from a single specimen collected in a banana store in England, and was probably introduced. *E. denerosa* occurs in the Seychelles. Other related species occur in Africa and Peru; a single species taken on Kerguelen Island was probably introduced from North America, where three other species occur.

Mockford and Gurney (1956) described the short-winged *R. squamosus* from Texas. The discovery of the present dimorphic species confirms their view that *squamosus* is a brachypterous *Rhyopsocus*. *R. pacificus* has longer wings than *R. squamosus* even in the brachypterous form, and differs in coloration.

This species seems to be particularly associated with *Pandanus*, having been taken in association with this plant on numerous occasions.

**Family PSYLLIPSEOCIDAE** Enderlein, 1911

**Characteristics:** Wings often reduced; hind tibia and tarsus together longer than abdomen; head long, vertical; antenna with more than 20 segments; scales lacking.

**Genus Psyllipsocus** Selys-Longchamps

15. **Psyllipsocus ramburii** Selys-Longchamps


*Nymphophus destructor* Enderlein, 1903, Zool. Anz. 27: 76.


**DISTRIBUTION:** Widespread.

This widespread species was recorded from Guam by Banks.

**FAMILY PACHYUTOCTIDAE** Pearman, 1936

**CHARACTERISTICS:** Body globular; femora not swollen, integument often sculptured; compound eyes always fairly large and hemispherical; meso- and metathorax always separated; apterous or winged; antennae of 15 segments, those of flagellum ringed; pterostigma present in fore wing but undifferentiated.

**KEY TO MICRONESIAN GENERA OF PACHYUTOCTIDAE**

In hindwing, vein r₁ present; subgenital plate without a T-shaped sclerite......**Pachytroctes**

In hindwing, vein r₁ absent; subgenital plate with a T-shaped sclerite..............**Tapinella**

**Genus Pachytroctes** Enderlein


*Peritroctes* Ribaga, 1911, Redia 7: 162.


*Namoseus* Pearman, 1928, Ent. Mon. Mag. 64: 133.

16. **Pachytroctes insularis** Thornton, Lee & Chui, n. sp. (fig. 6, a, b; 7, a, b)

**Macropterous form**

**FEMALE:** Coloration (after c. 20 years alcohol storage). Head generally fairly dark brown, slightly darker adjacent to eyes and on vertex. Ocelli pale, bordered brown; eyes dark brown. Maxillary palps fairly dark brown, apical segment pale cream in apical half. Antenna with scape and pedicel fairly dark brown, flagellar segments much paler brown, proximal two segments hyaline basally, fifth flagellar segment and succeeding segments with distinct hyaline rings. Thorax wholly fairly dark brown, including legs, except apex of tibia paler and tarsal segments progressively paler. Forewing more or less uniformly brown, rather paler brown adjacent to the brown veins, rather darker areas within most of cells. Hindwing paler brown than fore wing. Abdomen brown, broad annulations evident ventrally.

**Morphology.** Lacinia with three tines, two much longer than the third. Upper surface of head sinuous in front view, a blunt projection adjacent to each eye. Median epicranial suture distinct. Apical segment of maxillary palp with a group of about 8 sensilla. Head sculptured
with close-set short chitinoid rods, and sparsely and fairly uniformly beset with very short stout setae. Eyes with chitinoid rods between ommatidia. Anterior leg with broad femur, tibia no longer than femur; hind tibia distinctly longer than femur, which is narrower than that of anterior legs. P. Pearman’s organ lacking. Wings (fig. 6, a, b), as those of *Pachyroctes eulensis* Bad., in fore wing areola postica relatively high, *cu*, distinctly convex, fork of *rs* strongly divergent, wing completely bare. Hindwing with posterior edge strongly curved. Gonapophyses as in fig. 7, a. Subgenital plate without sclerotized bar. Paraprocts with three trichobothria without rosette sockets; epiproct triangular, with symmetrical chaetotaxy (fig. 7, b).

Body length (in alcohol): 1.4 mm.

**Apterous form**

**Female:** Differs from above, apart from lacking wings, in possessing a single trichobothrium on paraprocts and lacking ocelli. Also differs in coloration, head generally darker; prothoracic tergum dark brown, remaining terga whitish cream, corresponding pleura concolorous; legs dark brown except femur apically and tibia basally whitish cream (this cream coloration much less extensive on posterior leg). Thoracic terga each with a pair of lateral prominences, these quite large, and distinct lobes on metathorax.

Body length (in alcohol): 1.2 mm (average of 9 specimens, range 0.7–1.6 mm).

**Male:** Unknown.

DISTRIBUTION: S. Mariana Is. (Saipan, Tinian).

The aperous and fully winged forms of this species agree in all details of morphology except those known to be associated with aperous. The difference in pigmentation of the legs is not considered sufficient grounds for regarding the forms as distinct species, particularly in view of the fact that both were taken together on Saipan under bark. The two other collections were from similar habitats.

Badonnel (1949) described a *Pachytructes* species from the Congo which possessed fully winged and aperous forms, all females. The species described above, according to the criteria suggested by that author and by Pearman (1932) should be placed in *Pachytructes* rather than in *Tapinella*.

From Enderlein’s description and figure, (Enderlein, 1903), it appears that the eyes of *Psylloneura simbangana* are small, as in *Pachytructes*, not extending beyond the margin of the vertex, and there has been difficulty in distinguishing these two genera since the discovery of winged *Pachytructes*. There is no information on the genitalic features of *Psylloneura*. However, although not included in the generic diagnosis, the shape of the hindwing of *P. simbangana*, the type species of *Psylloneura*, is distinctive.

For this reason, we have placed the present species in *Pachytructes* rather than in *Psylloneura*. It is possible that this is the species recorded from Guam by Banks (1942), under the name *Psylloneura simbangana*, from which it differs in the shape of the hindwing, and body color. *P. insularis* differs from *P. ealensis* Bad. in coloration, and in epiproct chaetotaxy.

Genus **Tapinella** Enderlein


**KEY TO MICRONESIAN SPECIES OF TAPINELLA**

1. Fore and hindwings with hyaline basal quarter, pale brown in distal half, darker brown between these regions........................................................................................................19. *pictipenna*

   Fore and hindwings of uniform coloration.........................................................................................2

2. Thorax with grey-brown longitudinal pleural stripe, abdomen with double line of grey-brown spots each side........................................................................................................18. mariana

   Thorax and abdomen uniform in color............................................................................................17. *formosana*

17. **Tapinella formosana** Enderlein


**DISTRIBUTION**: India, Taiwan, Micronesia, Hawaii.
S. MARIANA IS. SAIPAN: Laulau Bay area, beating mango tree, Dec. 1944; Chalan Laulau area, under boards, Jan. 1945; As Mahetog area, Jan. 1945; As Mahetog area, sifting decaying banana stems and leaves, Apr. 1945; all by Dybas. TINIAN: Mar. 1945; NW slope Mt. Lasso, beating vegetation, Mar. 1945, Apr. 1945; all by Dybas.

18. **Tapinella mariana** Thornton, Lee and Chui, n. sp. (fig. 6, c, d; 7, c, d)

   **Female:** Coloration (after c. 20 years in alcohol). Wholly buff, with following exceptions: grey-brown mark from orbit to antennal socket, continuing to fronto-clypeal suture, apical segment of maxillary palp grey-brown in basal 2/3, grey-brown longitudinal pleural stripe each side of thorax, double line grey-brown spots each side of abdomen. Eyes black, ocelli pale. Forewing uniformly pale, hindwing paler.

   Morphology. I.O.: D. = 4.5:1. Venation of wings as in fig. 6, c, d. Pearman's organ lacking. No ctenidiobothria on tarsi. Gonapophyses (fig. 7, c) as usual for the genus, with fleshy dorsal valve. Subgenital plate (fig. 7, d) with row of quite stout setae along posterior margin; T-shaped sclerite with long, curved arms; anterior to this short setae fairly evenly distributed. Epiproct with a well-defined group of stout setae anteriorly, anterior margin sclerotized.

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![Figure 7](image-url)

**Figure 7.** *Pachyproctes insularis:* a, gonapophyses; b, epiproct; *Tapinella mariana:* c, gonapophyses; d, subgenital plate; T. pictipenna: e, gonapophyses; f, subgenital plate. Scales a–b, d, f = 0.1 mm; c, e = 0.05 mm.
Thornton, Lee & Chui—Psocoptera

Body length (in alcohol): 1.2 mm (2 specimens). Abdomen longer than head and thorax combined, fusiform.

Males: Unknown.

Holotype,♀(FM), Mariana Is., Tinian, NW slope Mt. Lasso, Apr. 4, 1945 Dybas.

Distribution: S. Mariana Is. (Tinian).

19. Tapinella pictipenna Thornton, Lee and Chui, n. sp. (fig. 6, e–h; 7, e, f)

Macropterous form

Females: Coloration (after e, 20 years in alcohol). Head light brown, darker on vertex than froms, a grey-brown band from orbit to antennal socket, clypeus paler in mid-line. Eyes black; ocelli pale, brown along inner margins. Maxillary palps and antennae very pale buff. Median epicranial and frontal sutures dark brown. Thoracic terga light brown; pleura with wide dark grey-brown longitudinal band each side. Legs: femur light brown except basally very pale cream, tibia light brown except apically very pale cream, other segments pale cream. Forewing (fig. 6, e) pale brown in distal half, hyaline in basal quarter, darker brown between these two regions; vein pigmentation similar to adjacent membrane, indistinct. Hindwing similarly marked, but brown parts paler. Abdomen creamy-buff, except each side a wide dark grey-brown longitudinal band.

Morphology. I.O.: D. = 4.5: 1. Wing venation as in fig. 6, e, f. Pearman's organ lacking. No ctenidiobothria on tarsi. Gonapophyses (fig. 7, e) with fleshy dorsal valve. Subgenital plate (fig. 7, f) with row of quite long setae along posterior margin; T-shaped sclerite with very long curved arms. Epiproct with a group of stout setae anteriorly. Paraprocts each with a group of four trichobothria in large sockets and one in a smaller socket, on a raised protuberance.

Body length (in alcohol): 1.1 mm (2 specimens).

Micropterous form

Differ from above, apart from in microptery (fig. 6, g, h), in having but a single trichobothrium on the raised area of each paraproct.

Males: Unknown.

Holotype,♀(Macropterous), (FM), Mariana Is., Saipan, As Mahetog area, sifting decaying banana stems and leaves, Apr. 22, 1945. Paratype♀(Micropterous), (FM), same data.

Distribution: Luzon, S. Mariana Is. (Saipan).

This species was also collected by I.W.B.T., beating dead rattan and banana leaves at Los Baños, Luzon, the Philippines, on Apr. 7, 1965. The wing and body markings are quite distinctive.

Family Caeciliidae Pearman, 1936

Characteristics: Head relatively short and wide; venation complete, areola postica free from media; veins and wing margins setose; tarsi two-segmented; female gonapophyses reduced.

Genus Caecilius Curtis

KEY TO MICRONESIAN SPECIES OF CAECILUS

1. Head with broad dark median stripe on frons and clypeus; eyes reddish orange, kidney-shaped ............................................ 22. casarum
Head not marked as above; eyes normal.................................................. 2
2. Forewing of uniform pale color............................................................ 3
Forewing with brown pigment, at least in anal area, and paler areas .......... 4
3. Areola postica extremely small, its height less than half that of pterostigma ................................................................. 23. novoguineensis
Areola postica height more than half that of pterostigma......................... 21. arotellus
4. Brown pigment of forewing confined to anal area, wing otherwise not patterned.............. 5
Brown pigment on forewing not confined to anal area............................ 7
5. In forewing, fusion of r and m extremely short, or a point junction........ 30. pseudanalis
In forewing, rs and m fused for a length greater than distance between costa and subcosta .................................................. 6
6. Head sclerites and thoracic terga shining, glossy.................................. 27. leuroceps
Head sclerites and thoracic terga not shining........................................ 20. analis
7. In at least distal half of forewing, posterior veins clearly bordered with brown pigment ........................................................................ 8
Veins of forewing without definite borders of brown pigment .................. 11
8. Pterostigma unpigmented, vertex not very sharply angled; fore wing less than 2.5 mm long ............................................................. 28. marginatus
Pterostigma pigmented within its distal posterior border, vertex sharply angled;
fore wing more than 2.5 mm long .......................................................... 9
9. Radial fork of forewing without pigmented border................................. 10
Radial fork of forewing, as media, with pigmented border ....................... 24. apicatus
10. Pattern in basal half of forewing sharply defined; a band of pigment extends from media to areola postica........................................ 26. kraussi
Pattern in basal half of forewing rather diffuse; areola postica pigment not extending to media .............................................................. 31. trukensis
11. Head uniform buff; pigment in apical half of forewing confined to margin, no large brown patch in basal half ........................................ 25. fusicipennis
Vertex brown, frons and clypeus buff, sharp demarcation of pigment between orbits;
apical half of forewing, except pterostigma, uniformly pigmented, a large dark brown patch in basal half .............................................. 29. marianus

20. Caecilius analis Banks.

DISTRIBUTION: N. Mariana Is. (Pagan), S. Mariana Is. (Saipan,
Tinian, Rota), Caroline Is. (Ponape, Kusaie), Marshall Is. (Lae, Lib Island,
Ailinglapalap, Arno), Hawaii.

N. MARIANA IS. PAGAN: Jul. 1951, R.M. Bohart.
S. MARIANA IS. SAIPAN: As Mahetog area, Jan. 1945, Dybas; hills
east of Garapan, beating, Jan. 1945, Dybas; Talofofo ridge, sweeping on open
hillside, Jan. 1945, Dybas. TINIAN: NW slope Mt. Lasso, Apr. 1945. ROTA:

PONAPE. Dec. 1937, Esaki; Kolonia, Jan. 1938, Esaki; Ag. Exp. Sta., Kolonia Jan.–Sep. 1950, Adams; Tolenat Peak, 198 m, Jun.–Sep. 1950, Adams; Ag. Exp. Sta., Kolonia, Jan. 1953, Gressitt; Nanponmal, 50 m, Jan. 1953, Gressitt; Jokaj I., 2 m, Jan. 1953, Gressitt.

KUSAIE. Mutunlik (Yepan), light trap, Jan. 1953, Gressitt; Mutunlik, 22 m, Jan. 1953, Clarke; Funnaupes, 1 m, Jan. 1953, Clarke; Hill 1010, 300 m, Feb. 1953, Apr. 1953, Clarke; Mt. Matantes, S. slope, 380 m, Mar. 1953, Clarke; Hill 541, 165 m, Mar. 1953, Clarke; Mutunlik, 22 m, beating dry banana leaves, Mar. 1953, Clarke.


This is one of the commonest psocids in the Hawaiian Islands. It has successfully colonized several low atolls in the Marshall Islands.

21. **Caecilius arotellus** Banks.


**DISTRIBUTION**: S. Mariana Is. (Guam).

Described from Guam by Banks. Not present in the collection before us.

22. **Caecilius casarum** Badonnel


**DISTRIBUTION**: Mozambique, Hong Kong, Samoa, Fiji, Hawaii, S. United States, coastal areas of new world tropics and subtropics, S. Mariana Is. (Saipan, Tinian), Caroline Is. (Yap, Ulithi Atoll), Marshall Is. (Eniwetok, Kwajalein, Majuro), Gilbert Is. (Butaritari, Marakei, Tarawa, Kuria).


YAP. MAP: coconut palm, Aug. 1950, Goss.


This species has a broad dark stripe down the middle of the frons and
clypeus, and the orange-rust eyes are kidney-shaped, not spherical. It is a widespread tropicopolitan species and has successfully colonized low atolls in the Marshall and Gilbert groups.


**DISTRIBUTION:** New Guinea, recorded by Karny from Fiji and Samoa, Bonin Is. (Chichi Jima), Caroline Is. (Palau).


This species was described from New Guinea. The single specimen from the Bonins has a slightly larger areola postica than those from Palau.

24. Caecilium apicatus Thornton, Lee and Chui, n. sp. (fig. 8, a; 12, a,c)

**MALE:** Coloration (after c. 10 years dry storage). Head buff, except frons anterior to ocelli and clypeus brown, eyes black, flagellum dark brown. Thoracic terga and pleura brown. Legs pale buff, except apical tarsal segment brown. Forewing (fig. 8, a) hyaline; veins cu and connection of m + cu to rs + m with adjacent cloudy brown pigment, veins in apical half of wing brown, with narrower border of brown pigment, other veins pale brown, anal cell suffused with brown pigment. Hindwing hyaline, veins brown. Abdomen buff.

12, a) setose, longer stout setae at lateral edges. Penis frame (fig. 12, c) with slight peg-like inner projections at base of parameres. A field of 25 trichobothria and a more apical field of minute fine setae on each paraprost.

Body length (after softening in alcohol): 1.4 mm.

**Female:** Unknown.

Holotype, ♂ (Bishop 9524), Moen I., Truk, Caroline Is., Mt. Teroko, light trap, breadfruit grove, 80 m, Feb. 5, 1953, Gressitt.

**Distribution:** Caroline Is. (Truk).

This large species has only been taken from Truk.

25. *Caecilius fuscipennis* Thornton, Lee & Chui, n. sp. (fig. 8, b, c; 10, a; 11, b)

**Female:** Coloration (after c, 12 years dry storage). Head pale buff, eyes black, ocelli pale. Two basal segments of flagellum pale buff, remaining segments dark brown. Maxillary palps pale buff. Thoracic terga brown, wide median cream band. Pleura light brown. Legs very pale buff. Forewing (fig. 8, b) marked with dark brown cloudiness along distal half of m + cu, cu, and in anal cell and apical half of areola postica; veins m and rs and their apical branches brown, basal sections of costa and of vein r brown, veins otherwise very pale except in regions of brown pigment. Hindwing hyaline, fuscous in anal cell (fig. 8c), vein r and ca, and ax very pale, other veins brown. Abdomen buff.

**Morphology. I.O.: D. = 2.2:1.** Number of ctenidiobothria on basal hind tarsal segment: 19. Subgenital plate (fig. 11, b) with discreet conical low lateral apophyses, pigmented area wide. Gonapophyses (fig. 10, a) with ventral valve rather straight. A field of 17 trichobothria on each paraprost.

Body length (after softening, in alcohol): 1.5 mm.

**Male:** Coloration (after c, 6 years dry storage). As female, except two basal segments of flagellum brown, other segments successively darker.

**Morphology. I.O.: D. = 0.3:1,** eyes very large. Genitalia: hypandrium simple, setose; penis frame as that of *C. apisatus*. A field of 23 trichobothria on each paraprost, and a field of minute spines on mesial surface, also on dorsal surface of epiproct between two stout setae.

![Figure 9.—Forewing: a, Caecilius marginatus; b, C. kraussi; c, C. trukensis. Scales = 0.3 mm.](image-url)
Body length: (after softening in alcohol): 1.4 mm.


DISTRIBUTION: Caroline Is. (Palau, Yap).

This species is closely similar to Caecilius trukensis. However, it is larger and differs in details of the forewing pattern.

26. **Caecilius kraussi** Thornton, Lee & Chui, n. sp. (fig. 9, b; 10, b)

**FEMALE**: Coloration (after c. 12 years dry storage). Head and body pale straw, with following exceptions: head anterior to a line joining orbits very dark brown, including frons, clypeus and labrum; apices of apical segments of maxillary palps dark brown; fourth flagellar segment brown, succeeding segments progressively darker; mesothoracic terga brown with narrower cream median line. Eyes black, ocelli pale. Forewing distinctly marked with brown (fig. 9, b), veins dark in pigmented areas, very pale in other areas, hindwing hyaline.

Morphology. I.O.: D. = 1.5:1; eyes ovoid, transverse diameter shorter than longitudinal one. Ocelli very small, closely grouped. Venation of forewing as in figure 9, b. Basal hind tarsal segment with 19 ctenidiobothria. Subgenital plate with lateral apophyses not projecting beyond margin. Gonapophyses (fig. 10, b). A field of 15 trichobothria on each paraproct.

Body length (after softening, in alcohol): 1.8 mm.

**MALE**: Coloration (after c. 12 years dry storage). As female, except flagellum wholly dark brown.

Morphology. I.O.: D. = 0.5:1; eyes ovoid but less narrow than female. Ocelli as female. Venation of forewing as female. Basal hind tarsal segment with 24 ctenidiobothria. Genitalia: hypandrium very similar to that of *C. apicus*, with long stout setae on posterior margin laterally. Peg-like projections of penis frame not visible. A field of 23 trichobothria on each paraproct.

Body length (after softening in alcohol): 1.6 mm.


DISTRIBUTION: Caroline Is. (Tobi, Sonsorol, Ulithi, Sorol, Woleai).

This distinctive species is apparently confined to low atolls in the western Carolines. It has never been taken on any of the high islands in Micronesia.

27. **Caecilius leuroceps** Thornton, Lee & Chui, n. sp. (fig. 8, d; 10, c; 11, a; 12, d)

**FEMALE**: Coloration (after c. 20 years dry storage). Head buff, eyes black, apical nine
flagellar segments brown. Thoracic terga brown, pleura and legs buff. Forewing veins (fig. 8, d) brown, membrane suffused with pale brown, slightly darker in anal cell.

Morphology. I.O.: D. = 2.0: 1. Head sclerites shining. Thoracic terga glossy. Number of ctenidiobothria on basal hind tarsal segment: 23. Subgenital plate (fig. 11, a) with low broad lateral apophyses, pigmented area very weakly sclerotized. Gonapophyses (fig. 10, c) with both valves curved. A field of 15 trichobothria on each paraproct.

Body length (after softening in alcohol): 1.5 mm.

Male: Coloration (after c. 10 years of dry storage). As female, except forewing membrane darker, darker pigment along m + cu and basal section of cu, paler area posterior to basal half of pterostigma, along cu, and r. Antennae wholly brown.

Morphology. I.O.: D. = 1.0: 1. Head sclerites shining. Thoracic terga glossy, number of ctenidiobothria on basal hind tarsal segment: 23. Genitalia: Hypandrium with fairly straight posterior edge, a group of setae on each side placed extremely laterally. Penis frame (fig. 12, d) outer parameres with c. 15 hyaline, tubercles subapically. Epiproct without papillar field. A field of 17 trichobothria and a field of minute papillae on each paraproct.

Body length (after softening in alcohol): 1.4 mm.


**Figure 10.**—Female gonapophyses: a, *Caucilius fusciipennis*; b, *C. kraussi*; c, *C. leuroceps*; d, *C. pseudanalis*; e, *C. marianus*. Scales 0.1 mm.

**DISTRIBUTION:** S. Mariana Is. (Saipan, Guam).

This fairly large species exhibits considerable variation in the degree of pigmentation of the forewing, but in general, that of the male is more heavily pigmented than the female. In the glossy head sclerites and thoracic terga, as well as in the general pattern of pigmentation of the fore wing, this species is similar to *C. badiosigma* Okamoto which occurs in Japan and Hawaii. It differs, however, in the shape of the pterostigma, which is less angular and narrower at the vertex.

This species has been taken in the S. Mariannas, and a mutilated specimen from Truk may belong to this species.

**28. Caecilius marginatus** Thornton, Lee & Chui, n. sp. (fig. 9, a; 11, e, f; 12, e)

**MALE:** Coloration (after c. 12 years dry storage). Head buff, except genae brown, frons with a medium brown mark anterior to ocellar protubercance, clypeus brown, with fine darker brown striae, flagellum very dark brown, almost black. Eyes black, ocelli pale, protubercance brown. Mesothoracic terga very dark brown, almost black, no median pale line, metathoracic terga dark brown. Legs buff, except on all legs apical tarsal segment brown, tibia of prothoracic leg brown in basal half. Forewing (fig. 9, a) pale fuscous, veins narrowly bordered with brown pigment except *ae* and veins bounding pterostigma and areola postica basally, fairly extensive brown pigment within pterostigma postero-distally. Hindwing paler, veins dark. Abdomen brown dorsally with narrow transverse bands, ventrally buff.

Morphology. I.O.: D. = 0.3:1, eyes very large, slightly notched anteriorly opposite antennal bases. Ocellar protubercance elongate, anterior ocellus twice as large as posterior ones. Clypeus and frons shining. Thoracic terga glossy. Anterior tibia swollen subapically, narrowing abruptly apically. Number of ctenidiothalia on hind tarsal segment: 34. Genitalia: hypandrium (fig. 11, f) with four regions of sclerotization, setose. Penis frame (fig. 12, c) bowed basally, slightly wider medially, with peg-like inner projections at base of parameres. Epiproct with a central sclerotized ridge connecting two long stout setae (fig. 11, e). Paraproct with a field of 31 trichobothria, a pair of pointed tubercles or a single one on dorsal margin close to well-marked field of prominent papillae (fig. 11, c).

Body length (in alcohol, after softening): 2.4 mm.

**FEMALE:** Unknown.


**DISTRIBUTION:** Caroline Is. (Palau).

This very large member of the flavidus group is apparently confined to Palau, and only males have been taken.

**29. Caecilius marianus** Thornton, Lee & Chui, n. sp. (fig. 8, e; 10, e; 11, e; 12, f)

**FEMALE:** Coloration (after c. 6 years dry storage). Head generally buff, vertex brown,
brown area sharply demarcated anteriorly transversely between orbits. Eyes black, ocelli pale. Basal four segments of antenna pale, rest successively darker. Thoracic terga dark brown, an obvious cream arrow-shaped mark on mesothorax. Forewing distinctively patterned with brown and hyaline areas (fig. 8, e). Hindwing pale fuscous, a little darker adjacent to veins.


Body length (after softening in alcohol): 1.5 mm.

Male: Coloration (after c. 6 years dry storage). As female.

Morphology. I.O.: D. = 1.0:1. Number of ctenidiobothria on basal hind tarsal segment: 27. Thoracic terga shining. Genitalia: hypandrium posteriorly with lateral groups of long setae, a bare area medially. Penis frame (fig. 12, f) lacking inner peg-like structure at base of parameres. A field of 20 trichobothria and rather dense field of minute setae with associated pointed spine on each paraproct.

Body length (after softening in alcohol): 1.4 mm.

Holotype, ♀ (BISHOP 9527), Mariana Is., Guam, Mt. Lamlam, Feb. 1958,

DISTRIBUTION: S. Mariana Is. (Guam).
This species has not been taken in Micronesia other than on the island of Guam.

30. Caecilius pseudanalis Thornton, Lee & Chui, n. sp. (fig. 10, d; 11, d; 12, b,h)
   
   FEMALE: Coloration (after c. 6 years dry storage). As Caecilius analis.
   
   Morphology. Number of ctenidiobothria on basal hind tarsal segments: 18–21. Fusion of rs and m in forewing very short or point junction. Subgenital plate (fig. 11, d), lateral apophyses not projecting beyond margin. Gonapophyses (fig. 10, d). A field of 16–17 trichobothria on each paraprop.
   
   Body length (after softening in alcohol): 1.5 mm–1.8 mm.
   
   MALE: Coloration (after c. 6 years dry storage). As female.
   
   Morphology. Number of ctenidiobothria on basal hind tarsal segment: 26. Forewing as female. Genitalia: hypandrium (fig. 12, b) ciliation fairly uniform, except shorter setae medially on margin. Penis frame (fig. 12, h) somewhat angular basally, prominent internal peg-like structures at base of parameres. Epiproct and paraprop with prominent fields of large raised papillae. A field of 21 trichobothria on each paraprop.
   
   Body length (after softening in alcohol): 1.4 mm
   
   
   DISTRIBUTION: Gilbert Is. (Tarawa, Butaritari), Ocean I.

   This species is closely similar to the widespread C. analis, but differs in being generally smaller, and in that the fusion of rs and m in the forewing is always very short, or a point junction. Most of the specimens from Tarawa Atoll have the junction at a point, those from Butaritari Atoll are mixed, almost half having a point junction, half having a very short fusion.

31. Caecilius trukensis Thornton, Lee & Chui, n. sp (fig. 9, c; 12, g)
   
   FEMALE: Coloration (after c 10 years dry storage). Head buff, eyes black. Two basal flagellar segments buff, apical segments brown. Thoracic terga brown, no median band visible. Pleura and legs pale buff. Forewing (fig. 9, c) with anal cell filled with brown fuscous pigment, brown cloudiness along distal part of basal section of ca, and to a lesser extent along apical two-thirds of boundary vein of areola postica, otherwise hyaline; veins m, rs and their apical branches brown, otherwise veins pale. Hindwing hyaline. Abdomen buff.
   
   
   Body length (after softening, in alcohol): 1.2 mm.
MALE: Coloration (after c. 10 years storage in alcohol). As female, except flagellum dark brown, basal half of basal segment paling to brown; in forewing whole of basal section of cu, suffused with dark brown pigment, paler pigment cloud around apical two-thirds of \( m + cu \) and its connection to \( rs + m \), connection of \( r \) to \( rs + m \) brown.

Morphology. I.O.: D. = 0.6:1. Number of ctenidiobothria on basal hind tarsal segment: 9. Genitalia: hypandrium with groups of long setae on posterior margin placed extremely laterally, medially very short fine setae. Penis frame (fig. 12g) very angular basally,
without inner peg-like structures at base of parameres. Epiproct without papillar field of any kind, and no field of fine setae. Paraproct with a field of 17 trichobothria.

Body length (after softening in alcohol): 1.2 mm.


DISTRIBUTION: Caroline Is. (Truk).

This species resembles Caecilius fuscipennis from Yap and Palau, but is smaller, has relatively smaller eyes, and differs in forewing pattern, which in this species shows slight sexual dimorphism. It is apparently confined to Truk Atoll.

FAMILY PHILOTARSIDAE Pearman, 1936

CHARACTERISTICS: Venation complete, areola postica free, veins and wing margins setose, tarsi three-segmented; female subgenital plate with single apical lobe, gonapophyses complete.

KEY TO MICRONESIAN GENERA OF PHILOTARSIDAE

Phallosome with penial sclerites; subgenital plate of female tapering to apex which has an apical medial insertion; lateral valve of female gonapophyses broadly triangular; forewing hairs sited on dark spots; antennal segments with white apices.................Aaroniella
Phallosome without penial sclerites; female subgenital plate with strip-like apical process twice as long as wide; lateral valve of female gonapophyses oval; forewing hairs not sited on dark spots; antennal segments without white apices..................Haplophallus

Genus Aaroniella Mockford


KEY TO MICRONESIAN SPECIES OF AARONIELLA

Forewing with a wide band of pigment from pterostigma to areola postica, interrupted or continuous, more than half pterostigma covered with brown pigment; head with triangular patch of pigment over epicranial suture..................................32. gressitti
Forewing with a narrow, discontinuous series of brown patches from pterostigma to areola postica, pterostigma with pigment only around margin; pigmented bands either side of epicranial suture, suture itself without patch of pigment..........................33. trukensis

32. Aaroniella gressitti Thornton, Lee & Chui, n. sp. (fig. 13, a; 14, c; 15, a; 16, a, b; 17, a)

FEMALE: Coloration (after c. 10 years alcohol storage). Head generally buff, usual vertex
markings reddish brown, arrow-shaped mark on epicranial suture. Clypeus with distinct brown parallel bands not extending to anterior margin. Genae pale, brown round antennal socket, broad brown band along lower border, narrower band along posterior border. Eyes black; ocelli pale, bordered black along inner margins. Antennae buff, flagellar segments ringed with white apically. Head pattern shown in fig. 17, a. Thorax dark brown. Legs wholly dark brown. Forewing (fig. 13, a) with a broken or continuous wide transverse brown band, no cloudiness in apical cells, pterostigma largely dark brown, large brown clouds in basal half of wing, two or three apical veins with small fuscous clouds apically, setae on veins sited on dark brown spots. Hindwing hyaline. Abdomen buff-brown, no visible transverse bands.

Morphology. I.O.: D. = 4.5: 1. Hind tarsal segments with 13; 1; 0 ctenidiobothria. Claws with pre-apical tooth, Pearman's organ complete. In hindwing rs setose almost to point of origin from m. Subgenital plate (fig. 15, a) setose over whole of disc, up to suture marking off sclerotized portion, apical sclerite not markedly wider basally. Gonapophyses (fig. 14, c) with outer valve roughly triangular. A field of 12–15 trichobothria on each paraprostom.

Body length (in alcohol): 1.6 mm (average of 5 specimens, range 1.5–1.8 mm).

Male: Coloration (after c, 10 years alcohol storage). As female.

Morphology. I.O.: D. = 3.8: 1. Hind tarsal segments with 13; 1; 0 ctenidiobothria. Claws and coxae as female. In hind wing rs bare for a distance from point of origin from m. Genitalia: hypandrium (fig. 16, a) slightly emarginate apically, conspicuously setose. Penis frame (fig. 16, b) small, radula not prominent. A round field of 17–21 trichobothria on each paraprostom.

Body length (in alcohol): 1.4 mm (average of 5 specimens, range 1.3–1.5 mm).


DISTRIBUTION: Caroline Is. (Palau, Yap, Ponape, Kusaie).

This species differs from A. pulchra Thornton, and A. maculosa (Aaron), of which the male genitalia are known, as does the next, in lacking distinct internal phallic sclerites. It differs from Aaroniella trukensis in head pattern,
forewing pattern, subgenital plate, hypandrium and penis frame. It is also smaller, there being no overlap in forewing length between the two species. Nevertheless the species are clearly very closely related; both are similar to Caecilius guttulatus Banks, described from the Philippines, the genitalia of which are not described, but which clearly should not be placed in Caecilius.

The genus has a Pacific and circum-Pacific distribution.

33. **Aaroniella trukensis** Thornton, Lee & Chui, n. sp. (fig. 13, b; 14, d; 15, b; 16, c, d; 17, b)

**Female:** Coloration (after c. 10 years dry storage). As Aaroniella grossiti, with the following exceptions: no arrow-shaped mark on epieranal suture (fig. 17, b), pigment lateral to suture merges into a single band, isolated spots lateral to these dark. Forewing (fig. 13, b) sometimes with vague spots in outer cells, often 4 veins with quite large fuscous clouds apically, transverse band narrow, always interrupted, pterostigma clear, with a few brown spots round margin, proximal spots small, discreet. Legs pale, tibia with wide dark band distally, narrower band near proximal end.

Morphology. I.O.: D. = 5.0: 1. Claws with preapical tooth, Pearman’s organ complete. In hind wing rs bare for a distance from point of separation from m. Subgenital plate (fig. 15, b) setae end posteriorly in subdilatral row some distance from sclerotized section of plate; apical sclerite wider basally. Gonapophyses (fig. 14, d). A field of 14–15 trichobothria on each paraproct.

Body length (in alcohol): 1.7 mm (average of 4 specimens, range 1.6–1.8 mm).

**Male:** Coloration (after c. 10 years dry storage). As female, except pigment in forewing rather more extensive, pterostigma often wholly dark, spots of transverse band quite large but band always interrupted.

Morphology. Claws with preapical tooth, Pearman’s organ complete. Vein rs in hindwing bare for a distance from point of separation from m. Genitalia: hypandrium (fig. 16, d) distinctly emarginate posteriorly. Penis frame (fig. 16, c) with fairly distinct radula. A round field of 19 trichobothria on each paraproct. Male forewing usually rather shorter than female.

**Figure 14.**—*Haplolithus fuscistigma*: a, forewing; b, hindwing; female gonapophyses: c, Aaroniella grossiti; d, *A. trukensis*; e, *H. boninensis*; f, *H. fuscistigma*. Scales a–b = 0.3 mm; c–d = 0.1 mm; e–f = 0.2 mm.
Body length (in alcohol): 1.5 mm (average of 3 specimens, range 1.4–1.6 mm).
Holotype, ♀ (BISHOP 9531), Caroline Is., Truk, Tol I., Mt. Unibot, native forest, light trap, 32 m, Jan. 4, 1953, Gressitt. Allotype, ♂ (BISHOP), same data. Paratype, Truk: Tol I., Olei, Apr. 12, 1940, Yasumatsu and Yoshimura; Moen I., 180 m, Jul. 31, 1946, Townes; Mt. Unibot, native forest, Jan. 3, 1953, Gressitt.

DISTRIBUTION: Caroline Is. (Truk).

This species, which is apparently confined to Truk, is rather larger than A. gressitti, and differs in head pattern, forewings pattern, details of ciliation of subgenital plate and shape of apical apophyses, hypandrium, and penis frame.

Genus Haplophallus Thornton


**KEY TO MICRONESIAN SPECIES OF HAPLOPHALLUS**

Pterostigma pigmented round margin with a distinct hyaline "window" within the cell; dorsal valve of female gonapophyses more than twice as long as outer valve; subgenital plate apical lobe about three times as long as broad......................... 35. _fusciostigma_

Pterostigma fairly evenly pigmented, without distinct hyaline "window"; dorsal valve of female less than twice as long as outer valve; subgenital plate apical lobe about twice as long as broad......................................................... 34. _boninensis_

**34. Haplophallus boninensis** Thornton, Lee & Chui, n. sp. (fig. 13, c, d; 14, e; 15, d; 16, e, f; 17, c)

**FEMALE:** Coloration (after c. 7 years dry storage). Head pattern as in fig. 17c, a cream band from gena around head across anterior part of clypeus. Eyes black. Antenna with basal two segments dark brown, flagellum brown. Maxillary palps brown, apical segment dark brown. Thoracic terga brown, margin cream, scutella paler. Pleura brown. Legs brown; femora marked with darker brown, anterior femur prominently banded, brown bands more extensive and merging in posterior legs; posterior tibia brown, a pale band sub-basally; tarsi dark brown. Forewing (fig. 13, c) similar to _H. fusciostigma_, but dark brown pigments in apical angle of second cubital and anal cells less extensive, no faint transverse band, pterostigma wholly brown. Hindwing (fig. 13, d) fuscous in costal cell and apical angle of cell Cu₂. Abdomen grey-brown dorsally and ventrally.

Morphology. I.O.: D. = 7.5: 1. Number of ctenidioothria on basal hind tarsal segment: 15. Hindwing rs setose only along r₄₊₄. Pearman's organ complete. Subgenital plate (fig. 15, d) apical lobe rather abruptly truncate, with 8 apical setae; disc setose and with narrow sclerotized band along posterior margin. Gonapophyses (fig. 14, c): ventral valve narrow; dorsal valve appearing rectangular but bent on itself at right angles, a distinct conical lobe on posterior margin bearing short sharp setae, outer valve oval, almost as long as dorsal valve. A field of 17 trichobothria on each paraproct and two central setae not in rosette sockets.

Body length (in alcohol): 2.4 mm (average of 5 specimens, range 2.1–2.6 mm).

**MALE:** Coloration (after c. 7 years dry storage). As female.

Morphology. I.O.: D. = 4.0: 1. Flagellar setae over twice as long as those of female.
FIGURE 15.—Subgenital plate: a, Aaroniella gressitti; b, A. trukensis; c, Hoplophallus fusistigma; d, H. boninensis. Scales a–b = 0.1 mm; c–d = 0.2 mm.

Number of ctenidiobothria on basal hind tarsal segment: 17. Pearman's organ complete. Genitalia: hypandrium (fig. 16, f) as usual for the genus. Penis frame (fig. 16, e) normal. An oval field of 24 trichobothria and three additional setae (2 central, 1 marginal) not in rosette sockets on each paraproct.

Body length (in alcohol): 1.9 mm (average of 5 specimens, range 1.8–2.2 mm).

Figure 16.—Aaroniella grossiti: a, hypandrium; b, penis frame; A. trukensis: c, penis frame; d, hypandrium; Haplophalus boninensis: e, penis frame; f, hypandrium; H. fusistigma: g, hypandrium; h, penis frame. Scales = 0.1 mm.


This species, confined to the Bonin and Volcano Islands, may be distinguished from H. fuscistigma in the Marianas by the pterostigma pigmentation and head pattern, as well as by the female genitalia. Like H. fuscistigma, it is related to H. orientalis Thornton found on the Asian mainland.

35. Haplophallus fuscistigma Thornton, Lee & Chui, n. sp. (fig. 14, a, b, f; 15, c; 16, g, h; 17, d)

Female: Coloration (after c. 20 years in alcohol). Distinct brown head markings as in figure 17, d. Antenna mid-brown, flagellar segments paler apically. Eyes black. Segments of maxillary palp brown basally, paler apically, except distal segment wholly dark brown. Thoracic terga brown, sutures prominently bordered cream, except scutella cream with very dark brown along anterior sutures; pleura brown. Legs: coxa and femur dark brown, trochanter
pale, tibia brown, darker narrow sub-basal and wide subapical band on tibia of pro- and mesothoracic legs, tarsi brown. Forewing (fig. 14, a) with conspicuous dark brown pigmentation within pterostigma bordering a central hyaline area, stigma sac and central hyaline area white by reflected light; veins brown, except C_{1} and C_{1,2}; dark brown pigmentation at distal end of cell C_{1,2}, fainter brown cloud at distal angle of first cubital cell, veins forming distal angle of basal radial cell bordered by diffuse brown pigmentation, this continuing as a fainter transverse band across wing. Hindwing (fig. 14, b) with faint brown pigmentation throughout costal cell and at distal angle of second cubital cell. Abdomen dorsally grey-brown except cream extremely basally and a cream transverse band anterior to apical sclerites; ventrally grey-brown.

Morphology. I.O.: D. = 7.5: 1. Number of ctenidiobothria on basal hind tarsal segment: 17. On r_{2} in hindwing, setae on branch r_{4,5} only. Pearman’s organ complete. Subgenital plate (fig. 15, c) with apical lobe long, spear-shaped, bearing six setae apically, sclerotized areas on disc widening basally, a narrow sclerotized band on each side close to posterior margin of main plate. Gonapophyses (fig. 14, f) ventral valve styliform; dorsal valve long, folded on itself at right angles, an ill-defined lobe on posterior margin; outer valve oval, much shorter than dorsal valve, evenly covered with long setae. A field of 26 trichobothria on each paraprost and two setae not in rosette sockets.

Body length (in alcohol): 2.2 mm (average of 5 specimens, range 2.1–2.2 mm).

MALE: Coloration (after c. 20 years alcohol storage). As female.

Morphology. Flagellar setae over three times as long as those of female. Number of ctenidiobothria on basal hind tarsal segment: 16. Pearman’s organ complete. Genitalia: hypantrium (fig. 16, g) simple, evenly setose, a slight median notch posteriorly. Penis frame (fig. 16, h) complete ring, no median basal thickening, outer parameres with hyaline tubercles on apices. An oval field of 18 trichobothria on each paraprost, with additional setae (2 central, 1 marginal) without rosette sockets.

Body length (in alcohol): 1.7 mm (one specimen).


DISTRIBUTION: S. Mariana Is. (Saipan).

This species is closely similar in wing pattern to H. fenestristigma (End.) (Seychelles) and H. orientalis Thornton (Hong Kong). It differs from both in head pattern and leg markings, and from H. orientalis in female genitalia.

FAMILY LACHESILLIDAE Badonnel, 1955

CHARACTERISTICS: Wings glabrous, venation complete; gonapophyses reduced; male abdominal apex complex; tarsi 2-segmented.

Genus Lachesilla Westwood

Lachesilla Westwood, 1840, Synopsis of the genera of British Insects: 47 (see note in Badonnel 1943, Faune Fr. 42: 102).
36. **Lachesilla pedicularia** (L.)

*Hemerobius pedicularius* Linné, 1758, Systema Naturae: 551.

*Hemerobius flavicans* Linné, 1758, Systema Naturae: 551.

*Termes fateicicus* Linné, 1758, Systema Naturae: 610 (see Gurney, 1939, J. Wash. Acad. Sci. 29 (11)).

*Hemerobius abdominalis* Fabricius, 1775, Systema Entomologicae: 310.


**DISTRIBUTION:** Cosmopolitan.

S. MARIANA IS. SAIPAN: As Mahetog area, at light, May 1945, Dybas.

**FAMILY ECTOPSOCIDAE** Roesler, 1952

**CHARACTERISTICS:** 2 tarsal segments; forewing not much wider subapically, apex rounded, pterostigma subrectangular, areole postica lacking, rs and m joined by short fusion, point, or crossvein; in hindwing rs and m usually joined by long crossvein; female subgenital plate usually bloomed apically; gonapophyses sometimes with dorsal and ventral valves reduced or lacking; phallosome with dorsal and ventral sclerotized lamellae or tubular, radial sclerites asymmetrical; wings held rather flat at rest.

**KEY TO MICRONESIAN GENERA OF ECTOPSOCIDAE**

Ninth tergite of male with transverse "comb" of sclerotized tubercles; female gonapophyses complete .......................................................... **Ectopsocus**

Ninth tergite of male with complex sclerotized structures, possibly including a "comb", consisting of various apophyses and tubercles; female gonapophyses consisting of rudiments of outer valve only.................................................. **Ectopsocopsis**

**Genus Ectopsocopsis** Badonnel


37. **Ectopsocopsis cryptomeria** (Enderlein)


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DISTRIBUTION: S. Mariana Is. (Saipan, Tinian), Europe, Malaya, Hong Kong, Taiwan, Japan, North America, Hawaii.

S. MARIANA IS. SAIPAN: As Mahetog area, Jan. 1945; Obyan Point, May 1945; May 1945; all by Dybas. TINIAN: ridge 1 mile N. of Tinian Harbor, beating, Mar. 1945, Apr. 1945; NW slope Mt. Lasso, beating, Feb. 1945, Apr. 1945; ridge, SE section, Mar. 1945; Apr. 1945; all by Dybas.

Genus Ectopsocus McLachlan


Chautopsocus Pearman, 1929, Ent. Mon. Mag. 64: 105.


Key to Micronesian Species of Ectopsocus

(E. waterstradii End., 1901 keys to 9, but the genitalia are unknown and it cannot be keyed further. From the description (Enderlein, 1903) the ninth tergite of the male appears to be very similar to that of E. maladroni, and there is a possibility of synonymy).

1. Forewing with pattern of pigment. ................................................................. 2

2. Forewing pattern consisting only of small pigmented spots at rs-m junction and apices of veins ................................................................. 38. briggsi

3. Forewing with hyaline windows at margin of cells R₄ and M₁. ................. 4

4. Forewing without hyaline windows at margins of cells R₄ and M₁. .......... 39. fullawayi

5. Forewing with a distinct darker spot over rs-m junction, pterostigma with an extensive hyaline window ....................................................... 52. spilotoS

6. Forewing with pigmentation uniform apart from hyaline areas, pterostigma wholly and uniformly pigmented ........................................... 46. marginatus

7. In hindwing vein r₂₊₃ lacking ........................................................................ 44. denervus

8. Forewing margin bare or setae microscopic, hindwing bare; subgenital plate distinctly bilobed ................................................................. 9

9. Forewing margin with obvious long setae, hindwing margin setose between r₁ and r₂₊₃. ........................................................................ 14
9. Each sub-lobe of subgenital plate with 4 setae
Each sub-lobe of subgenital plate with 3 setae

10. On each sub-lobe of subgenital plate, at least one seta is clearly posterior to the most mesial
On each sub-lobe of subgenital plate, no seta is clearly posterior to the most mesial

11. In forewing, origin of veins m₁ and m₂ faint or hyaline
In forewing, origin of veins m₁ and m₂ as distinct as their distal portions

12. Apical lobes of subgenital plate triangular, most mesial seta clearly the most posterior
Apical lobes of subgenital plate rhomboidal, most mesial seta not clearly the most posterior

13. Each lobe of subgenital plate with one apical short stout seta and two lateral more slender setae; ninth tergite of male with a continuous posterior “comb” of sclerotized tubercles and a subapical rugose area each side; phallosome posteriorly with pair of thimble-shaped sclerites
Each lobe of subgenital plate with two apical long setae and one shorter more slender lateral seta; ninth tergite of male with two separate “combs” of close-packed sclerotized rods; phallosome posteriorly with tricorne median sclerite

14. Apical lobe of subgenital plate with 8 setae
Apical lobe of subgenital plate with 6 setae

15. Ninth tergite of male with subapical band of small tubercles
Ninth tergite of male with apical row and median subapical group of small tubercles

38. Ectopsocus briggsii McLachlan


DISTRIBUTION: Europe, Africa, Australia, New Zealand, North South and Central America, S. Mariana Is. (Saipan).

S. MARIANA IS. SAIPAN: May 1945, Dybas.

39. Ectopsocus fullawayi Enderlein


DISTRIBUTION: Fiji, Samoa, Laysan, Hawaii, Tubuai, Rapa, Tuamotu archipelago, Pitcairn, Oeno, Henderson, Wake (Peale Island).


40. Ectopsocus maindroni Badonnel

Thornton, Lee & Chui—Psocoptera


DISTRIBUTION: Arabia, Africa, India, Malaya, Hong Kong, Philippines, Taiwan, Japan, Hawaii, Galapagos, N. and Central America, S. Mariana Is. (Saipan, Tinian), Caroline Is. (Palau, Kusaie), Marshall Is. (Ujae, Eniwetok), Gilbert Is. (Butaritari, Marakei).

S. MARIANA IS. SAIPAN: As Mahetog area, Jan. 1945, Sep. 1945; near Garapan, Jan. 1945; Mt. Tagpochau, 1 mile NNE of summit, on dry bird’s skeleton, Jan. 1945; As Mahetog area, beating, Mar. 1945; all collected by Dybas; Jun. 1951, R.M. Bohart. TINIAN: NW slope Mt. Lasso, beating, Mar. 1945, Apr. 1945; beach cove, S. of Gurgan Point, Apr. 1945; all by Dybas.

PALAU. KOROR: in pan of formalin-preserved fish, Apr. 1957, Clagg. KUSAIE. 1 m, Tafunsak, ex fruit, Mar. 1953, Clarke.


41. Ectopsocus pumilis (Banks)


DISTRIBUTION: Africa, India, Hong Kong, North America, S. Mariana Is. (Saipan).

S. MARIANA IS. SAIPAN: May 1945, Dybas.

42. Ectopsocus waterstradi (Enderlein)


Ectopsocus waterstradi: Enderlein, 1907, Notes Leyden Mus. 29: 120.

DISTRIBUTION: Java, Borneo, New Guinea, Bismarck Archipelago, Guam.

This species was recorded from Guam by Banks.
43. *Ectopsocus boharti* Thornton and Wong


DISTRIBUTION: Bonin Is. (Chichi Jima).

BONIN IS. CHICHI JIMA: Jul. 1957, R.M. Bohart.

44. *Ectopsocus denervus* Thornton and Wong


DISTRIBUTION: Philippines, Samoa, S. Mariana Is. (Saipan, Guam), Caroline Is. (Palau, Yap, Truk, Ponape, Kusaie), Gilbert Is. (Butaritari).


TRUK. MOEN: Mt. Teroken, 80 m, light trap, Dec. 1952, Gressitt; Mt. Teroken, 30 m, light trap, Feb. 1953, Gressitt.

PONAPE. Colonia, 16 m, Ag. Exp. Sm., light trap, Jan. 1953, Apr. 1953, Gressitt.

KUSAIE. MUTUNLIK: Jan. 1953, Gressitt; Hill 1010, 300 m, light trap, Apr. 1953, Clarke; Malen R., 90 m, Apr. 1957, Clarke.


45. *Ectopsocus fenestratus* Thornton and Wong


DISTRIBUTION: S. Mariana Is. (Saipan, Tinian, Guam).


46. *Ectopsocus marginatus* Thornton and Wong


DISTRIBUTION: S. Mariana Is. (Saipan, Tinian, Guam).

S. MARIANA IS. SAIPAN: Lauau Bay area, beating, Dec. 1944, Dybas;

47. Ectopsocus ornatoideis Thornton and Wong


**DISTRIBUTION:** Bonin Is. (Chichi Jima), S. Mariana Is. (Saipan, Tinian), Caroline Is. (Palau, Truk, Ponape, Kusaie), Marshall Is. (Jaluit, Jemo), Fiji, Samoa, Hawaii.

**BONIN IS. CHICHI JIMA:** Jul. 1951, R.M. Bohart.


**TRUK. MOEN:** Civ. Ad. Area, at light, Mar. 1949, Potts.

**PONAPE. SE Nanponomal, Berlese, Jan. 1953, Gressitt.**

**KUSAIE.** Tafunsak, 1 m, ex fruit, Mar. 1953, Clarke; Lele I., 1 m, beating, Mar. 1953, Clarke.


48. Ectopsocus paraplesius Thornton and Wong


**DISTRIBUTION:** Caroline Is. (Truk).

**TRUK.** Tol: Mt. Unibot, 300 m, Feb. 1953, Gressitt.

49. Ectopsocus salpinx Thornton and Wong


**DISTRIBUTION:** Malaya, Palawan, Luzon, S. Mariana Is. (Guam).


50. Ectopsocus separatus Thornton and Wong


**DISTRIBUTION:** Caroline Is. (Kusaie).

**KUSAIE.** Malem R., 90 m, Apr. 1953, Clarke.
51. **Ectopsocus speciosus** Thornton and Wong


**DISTRIBUTION:** New Guinea, Caroline Is. (Palau), Philippines.

**PALAU:** Babelthuap: Ngiwal, May 1957, Sabrosky.

52. **Ectopsocus spilotus** Thornton and Wong


**DISTRIBUTION:** Fiji, Samoa, Hawaii, Marshall Is. (Arno), Gilbert Is. (Tarawa).

**MARSHALL IS. ARNO:** Majuro, Apr. 1950, La Rivers; Majuro, Jun. 1950, Usinger.

**GILBERT IS. TARAWA:** Betio I., Nov. 1957, Dec. 1957, Krauss.

53. **Ectopsocus thysanus** Thornton and Wong


**DISTRIBUTION:** S. Mariana Is. (Saipan, Tinian, Guam).

**S. MARIANA IS. SAIPAN:** Laulau Bay, Tuturam, beating, Jan. 1945; Kalabera area, beating, Jan. 1945, Feb. 1945; Halaihai-As Teo area, Feb. 1945; Sadog Talofou, Talofou area, beating, May 1945; near Garapan, MLN, beating, Mar. 1945; all by Dybas. **TINIAN:** NW slope Mt. Lasso, Feb. 1945–Apr. 1945; ridge, SE section, Mar. 1945; NE slope Mt. Lasso, Apr. 1945; all by Dybas. **GUAM:** Yigo, Feb. 1958, Krauss; Ritidian Point, on fern, Apr. 1936, Bryan.

54. **Ectopsocus villosus** Thornton and Wong


**DISTRIBUTION:** Caroline Is. (Truk, Ponape, Kusaie), Marshall Is. (Jaluit).

**TRUK. MOEN:** Mt. Teroken, Dec. 1952, Gressitt; **FFEAN:** Mt. Iron, 150 m, Jan. 1953, Gressitt; **TOL:** Mt. Unibot, 39 m, Feb. 1953, Gressitt.

**PONAPE. Ag. Exp. Stn., Jun.–Sep. 1953, Adams; Colonia, Jan. 1953, Clarke.**

**KUSAIE.** Tafunsak, 1 m, *ex fruit*, Mar. 1953, Clarke; Lele I., 1 m, beating, Mar. 1953, Apr. 1953, Clarke; 165 m, beating, Mar. 1953, Clarke; Mutunlik, attracted to drying *Cyathea* leaves, Apr. 1953, Clarke; Malem R., 90 m, Apr. 1953, Clarke.

**MARSHALL IS. JALUIT:** Jabor I., May 1958, Gressitt; Majetto I., Apr. 1953, Gressitt.

**FAMILY PERIPSCICIDAE** Pearman, 1936

**CHARACTERISTICS:** 2 tarsal segments; forewing considerably wider subapically, apex tapering, pterostigma wider subapically, areola postica lacking, *rs* and *m* joined by fairly
long fusion; in hindwing rs and m joined by fusion; female subgenital plate usually with single apical lobe; gonapophyses complete; phallosome frame-like, usually 3 symmetrical radula sclerites; wings held roof-wise at rest.

Genus *Peripsocus* Hagen


**Key to Micronesian Species of Peripsocus**

1. In forewing, pterostigma with large, reddish-brown spot in apical third, veins at rs-m junction faint, in hyaline area............................................55. *ferrugineus*
   In forewing, pterostigma not as above, veins at rs-m junction normal..............................2

2. Forewing veines generally bordered with brown pigment, pterostigma pigment not peculiar, pigment on apical margin no darker than in some other areas...56. *pauliani*
   Forewing without pigment along veins, pterostigma fairly uniformly reddish-brown, apical margin of wing darker than rest of membrane........................................57. *suffitus*

55. *Peripsocus ferrugineus* Thornton and Wong


DISTRIBUTION: S. Mariana Is. (Saipan, Tinian, Guam), Caroline Is. (Tobi, Yap, Woleai, Ifalik, Truk, Ponape, Kusaie, Kapingamarangi), Fiji, Samoa, Hawaii.


YAP. Yap, Oct. 1952; Yap Hill behind Yaptown, 60 m, Nov. 1952, Gressitt; Mt. Matade, 60 m, Dec. 1952, Gressitt.


TRUK. FEFAN: Mt. Iron, 180 m, Jan. 1953, Gressitt.

PONAPE. Jul. 1950, Adams; Jokaj I., 2 m, Jan. 1953, Gressitt.

KUSAIE. Mutunlik, Aug. 1953, Clarke.

56. *Peripsocus pauliani* Badonnel


DISTRIBUTION: Africa, Malaya, Hong Kong, Philippines, Galapagos, Volcano Is. (Iwo Jima), S. Mariana Is. (Saipan, Tinian), Caroline Is. (Palau,
Yap), Marshall Is. (Kwajalein).

VOLCANO IS. IWO JIMA: sweeping, May 1958, Snyder.

S. MARIANA IS. SAIPAN: Laulau Bay area, beating, Dec. 1944; Achugan, Dec. 1944; near Garapan, Dec. 1944, Jan. 1945, Mar. 1945; As Mahetoge area, Jan. 1945; hills E. of Garapan, beating, Jan. 1945; Mt. Tagpochau, 300 m, Feb. 1945; Kalabera area, Feb. 1945; Obyan Point, May 1945; all collected by Dybas. TINIAN: ridge, SE section, Mar. 1945; NW slope Mt. Lasso, Apr. 1945; Lake Hagoi, beating, Apr. 1945; all by Dybas.

PALAU. BABELTHUAP: Melekei, at light, May 1957, Clagg.


MARSHALL IS. KWAJALEIN: light trap, Sep. 1956, Clagg.

57. Peripsocus suffitus Enderlein


DISTRIBUTION: New Guinea, Guam.

This species was reported from Guam by Banks (1942). The record is regarded as questionable.

Family Hemipsocidae Pearman, 1936

CHARACTERISTICS: In forewing m 2-branched, areola postica joined to m by cross-vein, tarsi 2-segmented.

Genus Hemipsocus Selys-Longchamps


Key to Micronesian Species of Hemipsocus

Forewing with setae of veins sited on dark spots...........................................59. roseus

Forewing without dark spots on veins.........................................................58. chloroticus

58. Hemipsocus chloroticus (Hagen)


**DISTRIBUTION:** Ceylon, Vietnam, Java, Borneo, Philippines, Taiwan, Japan, Amami Is., Hawaii, S. Mariana Is. (Guam), Caroline Is. (Yap, Ulithi, Truk, Kusaie), Marshall Is. (Arno).


TRUK. MOEN: Mt. Tonaachau, S. valley, Apr. 1949, Potts.

KUSAIE. Malem R., 90 m, beating, Mar. 1953, Clarke.

MARSHALL IS. ARNO: Ine I., Aug. 1950, La Rivers.

59. **Hemipsocus roseus** (Hagen)


**DISTRIBUTION:** Ceylon, Thailand, Philippines, Hawaii, Central America, West Indies, Caroline Is. (Palau).


PONAPE. SE Nanponmal, at light, 70 m, Jan. 1953, Gressitt.

This is the same species as that occurring in Hawaii, and may be synonymous with _H. selysianus_ End., which is recorded from Singapore, Sumatra, Java, Taiwan and Samoa. We have also examined specimens of spotted winged _Hemipsocus_ which are apparently of this species from Vietnam and New Guinea. It has been trapped in ships’ aerial nets on two occasions near the Philippines.

**FAMILY PSEUDOCACILIIDAE** Pearman, 1936

**CHARACTERISTICS:** Forewing venation as _Caelifera_, sometimes with median vein but 2-branched, pterostigma long and flat, areola postica flat, veins and margin with long setae, setae sometimes also on membrane; gonapophyses complete, dorsal and ventral valves often lobed; tarsi 2-segmented.
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KEY TO MICRONESIAN GENERA OF PSEUDOCAECILIIDAE

1. In forewing, median vein 3-branched...............................................................2
   In forewing, median vein 2-branched.............................................................
   Pseudoscottiella

2. Apices of veins of forewing with cloudy pigment; rs stalk less than half length of \( r_{4+5} \) .................................................................
   Lobocaecilius
   Apices of veins of forewing without cloudy pigment; rs stalk at least as long as \( r_{4+5} \)........3

3. Dorsal and ventral valves of female gonapophyses each with distinct lobe and style,
   radula of penis with rod-like sclerites.........................................................Heterocaecilius
   Ventral valve always without lobe, dorsal valve without lobe or with indistinct lobe;
   males unknown..................................................Pseudocaecilius

Genus Heterocaecilius Lee and Thornton


KEY TO MICRONESIAN SPECIES OF HETEROCAECILIUS

1. Forewing membrane hyaline..........................................................................2
   Forewing membrane with some brown pigmentation and vague hyaline areas.......3

2. Forewing veins darker distally, areola postica shallow; posterior margin of ninth tergite
   of male with a pair of tubercular fields.......................................................62. campanula
   Forewing veins no darker distally, areola postica rather high; posterior margin of ninth
   tergite of male with a continuous row of tooth-shaped projections and a central field
   of spinellets.................................................................................................63. dybasi

3. In forewing, proximal half of areola postica hyaline, posterior border of pterostigma without
   distinct brown border; lobes of female subgenital plate sharply pointed, narrow
   .....................................................................................................................60. adamsi
   In forewing, areola postica uniformly pigmented light brown, posterior border of
   pterostigma with distinct brown border; lobes of female subgenital plate bluntly
   pointed, very broad and shallow.................................................................61. minotus

60. Heterocaecilius adamsi Lee and Thornton
    DISTRIBUTION: Caroline Is. (Ponape).

61. Heterocaecilius minotus Lee and Thornton
    SW, 25 m, light trap, Dec. 1952, Gressitt.
PONAPE. Jan. 1953, Gressitt; Sep. 1950, Adams; Mt. Tamatamansakir, 180 m, Jan. 1953, Gressitt.
KUSAIE. Mutunlik, Jan. 1953, Gressitt; Mt. Matante, 580 m, beating, Mar. 1953, Clarke.
MARSHALL IS. EBON: Sep. 1953.

62. Heterocaecilius campanula Lee and Thornton
DISTRIBUTION: Caroline Is. (Ponape, Kapingamarangi), Marshall Is. (Majuro), Gilbert Is. (Butaritari, Tarawa).
PONAPE. light trap, Jan. 1953, Gressitt.
CAROLINE ATOLLS. KAPINGAMARANGI: Aug. 1946, Townes.
MARSHALL IS. MAJURO: Aug. 1946, Townes.

63. Heterocaecilius dybasi Lee and Thornton
DISTRIBUTION: S. Mariana Is. (Saipan, Tinian), Gilbert Is. (Butaritari).
S. MARIANA IS. SAIPAN: beating vegetation, Jan. 1945, Dybas.
TINIAN: NW slope, Mt. Lasso, Apr. 1945, Dybas.

Genus Lobocaecilius Lee and Thornton


Key to Micronesian Species of Lobocaecilius

In forewing, pigment over extremities of veins diffuse, vein r of male without papillae; 4 apical lobes of female subgenital plate distinct...........................64. cynara
In forewing, pigment over extremities of veins not diffuse, vein r of male with papillae;
apical lobes of subgenital plate low, not clearly divided into 4................65. fennecus

64. Lobocaecilius cynara Lee and Thornton
DISTRIBUTION: Caroline Is. (Palau).

65. Lobocaecilius fennecus Lee and Thornton


YAP. Nov. 1952, Gressitt.


Genus **Pseudocaecilius** Enderlein


**KEY TO MICRONESIAN SPECIES OF PSEUDOCAECILIUS**

1. Forewing uniformly greyish hyaline..........................................................67. marshalli
   Forewing with cloudy pigmented band across areola postica to media and across apical half of pterostigma......................................................2

2. Mesial borders of apical sublobes of subgenital plate about half length of apical setae, sublobes well developed, tapering distally........................................66. criniger
   Mesial borders of apical sublobes of subgenital plate less that a quarter length of apical setae, sublobes very short and little wider than setal bosses......................68. tahitiensis

66. **Pseudocaecilius criniger** (Perkins)


DISTRIBUTION: Bonin Is. (Chichi Jima), S. Mariana Is. (Saipan, Tinian, Guam), Caroline Is. (Palau, Yap, Ponape), and tropicopolitan.


67. Pseudocaecilius marshalli Karny


DISTRIBUTION: Fiji, S. Mariana Is. (Guam).


68. Pseudocaecilius tahitiensis (Karny)


DISTRIBUTION: Tahiti, S. Mariana Is. (Saipan, Tinian).


Genus Pseudoscottiella Badonnel


KEY TO MICRONESIAN SPECIES OF Pseudoscottiella

1. Forewing hyaline, or if pigment present it is confined to one or all of: pterostigma, areola postica, cell Ax
   Forewing pigmented in areas other than pterostigma, areola postica, cell Ax
2. 3
3. Arcola postica uniform faint grey or hyaline
Areola postica with a proximal pigmented band. 3.

**Cell Ax of forewing pigmented; hypandrium apically with small pointed projections**

...........................................................................................................................................................................

73. **fuscistigma**

Cell Ax of forewing as rest of wing, greyish hyaline; hypandrium simple, with apical serrations just discernible. ............................72. **clarkei**

4. In hindwing, veins r+s, and m setose, in forewing pterostigma cell as rest of membrane

...........................................................................................................................................................................

75. **pallida**

In hindwing, veins r+s, and m without long setae, in forewing pterostigmal cell granular

...........................................................................................................................................................................

76. **postica**

5. In forewing, whole of cell R3 pigmented. ............................77. **pseudornatus**

In forewing, cell R3 not completely pigmented. ............................6

6. In forewing, cell R3 unpigmented........................................7

In forewing, at least half of cell R3 pigmented. ............................8

7. In forewing, both areola postica and cell Ax uniformly pigmented. 74. **gressitti**

In forewing, areola postica pigmented only in basal half; cell Ax pigmented in basal and apical thirds only. ............................70. **bifasciata**

8. In forewing, cell R3 completely covered with pigment, which does not extend into cell R4. ............................71. **circularis**

In forewing, cell R3 not completely pigmented, pigment extending into distal part of cell R4 up to pterostigma. ............................69. **ornatus**

**69. Pseudoscottiella ornatus** (Banks) NEW COMBINATION (fig. 18, a; 19, f; 20, c; 21, a)


**Morphology.** I.O.: D. = 0.9: 1. In forewing rs and m fused for a short distance; r+s, r+s, m, and m, rather long; pterostigma long and narrow; areola postica elongated. Hindwing with r+s and m setose. Proximal hind tarsal segment with 14 etenidiobothria; claws unoothed. Genitalia: hypandrium (fig. 20, a) apically bilobed, bearing laterally a pair of short posteriorly directed pointed sclerotized rods, and mesially a field of fine papillae. Penis frame (fig. 19, f) with broad base, outer paramerae slightly divergent, inner paramerae narrow, united at apex, point of fusion serrated; a pair of narrow sclerotized radula sclerites. Ninth abdominal tergite (fig. 21, a) with anterior band of sclerotization; along posterior margin at base of epiproct a pair of papillose strips. Paraproct with 10 trichobothria. Epiproct bears an apical field of papillae.

**Body length** (in alcohol): 1.9 mm.

Banks' figure of the forewing of this species (fig. 1, h, Banks 1942) is obviously upside down.

**DISTRIBUTION:** S. Mariana Is. (Guam).

S. MARIANA IS. GUAM: Plesiotype, ♂ (BISHOP) Pott's Junction, Oct. 1952, Krauss; Piti, Jul. 1936, Swezy & Usinger; Barrigada Jun. 1936,

70. **Pseudoscottiella bifasciata** Thornton, Lee & Chui, n. sp. (fig. 18, b; 22, a,e,i)

**Female:** Coloration (after softening in dil. NaOH following 13 years dry storage). Head
generally pale with vertex and mesial borders of eyes brown. Eyes and ocelli pale. Maxillary palp very light grey. Antenna (damaged) light grey. Dorsum and antedorsum of meso- and metathorax dark grey brown. Thoracic pleura very pale grey. Forewing (fig. 18, b) hyaline, with a brown oblique band stretching from proximal angle of areola postica along the proximal region of m, the junction of rs and m and the bases of both; brown pigmentation in wing membrane on either side of distal tip of an and at proximal angle of cell An; veins light yellow brown. Hindwing hyaline, with brown band similar to forewing. Legs with pale grey coxa, trochanter and femur, light grey-brown tibia and tarsus. Abdomen very pale buff.

Morphology. I.O.: D. = 4.0: 1 (3.5: 1 in paratype). In forewing rs and m fused for a short distance, M cell distally rather narrow, areola postica long. Hindwing with r<sub>4+5</sub> and m setose. Proximal hind tarsal segment with 13 ctenidiobothria; claw untoothed. Subgenital plate (fig. 22, c) simple and undivided, bearing 2 pairs of long setae. Gonapophyses (fig. 22, i): ventral valve slightly lobate with an apical bristled stylet; dorsal valve lobate, bearing a subapical stylet, bristled and projecting well beyond lobe; outer valve narrow at base and apex, with a broad middle portion and bearing about 11 long setae. Ninth abdominal tergite (fig. 22, a) with a submarginal sclerotized pattern along anterior border. Paraproct with 9 trichobothria.

Body length (in alcohol): 2.0 mm (2.1 mm in paratype).

**Male:** Unknown.


**DISTRIBUTION:** Caroline Is. (Truk).

71. **Pseudoscottiella circularis** Thornton, Lee & Chui, n. sp. (fig. 18, c; 19, a; 20, b; 21, b; 22, b, f, j)

**Male:** Coloration (after softening in dil. NaOH following about 16 years dry storage). Vertex, frons, gena and clypeus brown; area between ocelli and clypeus lighter; rest of head very pale whitish grey. Eyes and ocelli pale. Antenna (damaged) with dark grey-brown scape and pedicel, grey-brown flagellum. Maxillary palp very pale grey. Dorsum and antedorsum of meso- and metathorax dark grey-brown. Pleura and sterna of thorax grey-brown. Forewing (fig. 18, c) hyaline with an oblique grey-brown apical band and grey-brown pigmentation around region of rs and m junction, An and Cu<sub>1</sub> cells and proximal half of costal region; veins r<sub>1</sub> and m near rs-m junction pale, otherwise dark brown. Hindwing greyish hyaline, fainter in some areas; veins yellow-brown, lighter distally. Legs with grey tibia and tarsus, rest of leg pale grey. Abdomen very pale grey with dark grey apex.

Morphology. I.O.: D. = 2.6: 1 (2.8: 1 in paratype). In forewing rs and m fused for a distance; r<sub>2+3</sub> and r<sub>4+5</sub> distally divergent forming a bell-shaped R<sub>1</sub> cell; pterostigma long and narrow, areola postica long, slightly angular. Hindwing: veins with very fine hairs; r<sub>2+3</sub>, r<sub>4+5</sub> and m without long setae. Proximal hind tarsal segment with 13 ctenidiobothria; claw untoothed. Genitalia: hypandrium (fig. 20, b) bilobed, with shallow mesial indentation between lobes; bearing laterally a pair of short, posteriorly directed, pointed sclerotized rods; at base of lobes a field of fine papillae. Penis frame (fig. 19, a) with broad base; outer parameres broad and divergent; inner parameres united at apex; with a pair of broad, pointed sclerotized radula rods. Ninth abdominal tergite (fig. 21, b) with anterior band of sclerotization; its posterior margin, at base of epiproct, with a pair of knob-shaped thorn-covered projections. Paraproct with 10 trichobothria. Epiproct without apical field of papillae.

Body length (in alcohol): 1.5 mm.
Female: Coloration (after softening in dil. NaOH following about 16 years dry storage). Head generally grey. Eyes and ocelli pale. Antenna (damaged) light yellow brown. Maxillary palp lost. Thorax light grey brown. Forewing hyaline with grey-brown pigmentation around region of rs and m junction, proximal and distal angles of Cu$_2$ and Au cells and proximal angle of areola postica; vein r$_{4+5}$ grey-brown, other veins faint and indistinct. Hindwing hyaline. Bases of rs and m, their junction and cu$_1$ brown, other veins faint. Abdomen very light grey.

Morphology. I.O.: D. = 4.0:1. In forewing rs and m fused for a distance, r$_{1+3}$, r$_{4+5}$, m$_1$, and m$_2$ long, areola postica elongate. Hindwing: r$_{2+3}$, r$_{4+5}$ and m without long setae. Legs lost. Subgenital plate (fig. 22, f) simple, undivided, bearing five long setae. Gonapophyses (fig. 22, j): ventral valve slightly lobate with apical stylet bearing spinelets; dorsal valve lobate with subapical stylet bearing spinelets and projecting well beyond lobe; outer valve barrel-shaped, covered with more than eight long setae. Ninth abdominal tergite (fig. 22b) with submarginal sclerotized pattern along anterior border. Paraproct with 10 trichobothria.

Body length (in alcohol): 1.6 mm.

Kolonia, Jan. 16, 1938, Esaki.

**DISTRIBUTION:** Caroline Is. (Ponape).

**72. Pseudosciellia clarkei** Thornton, Lee & Chui, n. sp. (fig. 18, d 19, b; 20, c; 21, c)


Morphology. I.O. : D = 0.9 : 1. In forewing rs*, rs, m* and m* rather long; rs and m* fused for a distance; pterostigma slightly rounded distally, areola postica long. In hindwing m forked, m* incomplete; veins r2+3, r4+5, m, and m* without long setae. Proximal hind tarsal segment with 13 ctenuidothoraxia; claw untoothed. Genitalia: hypandrium (fig. 20, c) simple, undivided, serrated at apex. Penis frame (fig. 19, b) broad; inner parameres united at apex, point of fusion serrated; with a pair of sclerotized radula rods. Ninth abdominal tergite (fig. 21, c) with anterior sclerotized band. Paraproct with 10 trichobothria. Apex of epiproct with a field of papillae.

Body length (in alcohol): 2.0 mm.

**FEMALE:** Unknown.


**DISTRIBUTION:** Caroline Is. (Palau).

**73. Pseudosciellia fuscistigma** Thornton, Lee & Chui, n. sp. (fig. 18, e; 19, c; 20, d; 21, d)

**MALE:** Coloration (after softening in dil. NaOH following about 9 years dry storage). Head generally grey, vertex and mesial borders of eyes grey-brown. Eyes and ocelli pale. Antenna and maxillary palps lost. Thoracic sclerites grey-brown. Forewing (fig. 18, e) proximal portion damaged, hyaline, with grey-brown pigmentation in pterostigma and an, light grey pigmentation in Cu2; veins grey-brown. Legs with grey-brown tibia and tarsus, rest of leg very pale grey. Abdomen very pale with grey apex.

Morphology. I.O. : D = 2.7 : 1. In fore wing rs and m* fused for a distance, R3 cell bell-shaped, pterostigma long and narrow, areola postica elongate, flat. Proximal hind tarsal segment with 13 ctenuidothoraxia; claw untoothed. Genitalia: hypandrium (fig. 20, d) simple, undivided, bearing apically a pair of small pointed sclerotized projections. Penis frame (fig. 19, c); outer parameres slightly convergent; inner parameres united at apex for a distance, point of fusion serrated; a pair of sclerotized radula rods. Ninth abdominal tergite (fig. 21, d) with an anterior sclerotized band. Paraproct with 19 trichobothria. Apex of epiproct with a field of papillae.

Body length (in alcohol): 1.8 mm.

**FEMALE:** Unknown.


**DISTRIBUTION:** Caroline Is. (Palau).
**Thornton, Lee & Chui—Psocoptera**

Figure 20.—Hypandrium: a, *Pseudoscottiella ornatus*; b, *P. circularis*; c, *P. clarkei*; d, *P. fuscistigma*; e, *P. gressitti*; f, *P. postica*; g, *P. pseudornatus*. Scales a–b, f = 0.2 mm; c–e, g = 0.1 mm.

74. **Pseudoscottiella gressitti** Thornton, Lee & Chui, n. sp. (fig. 18, f; 19, d; 20, e; 21, e)

**Male:** Coloration (after softening in dil. NaOH following about 13 years dry storage). Vertex, frons, clypeus and gena dark brown with two paler areas on either side of ocelli near antero-mesial border of eyes; rest of head very light grey-brown. Eyes very light yellow-brown. Ocelli pale. Antenna (damaged) with dark grey-brown scape and pedicel. Maxillary palp very light grey. Dorsum and anteculum of meso- and metathorax dark grey-brown, rest of thorax slightly lighter. Forewing (fig. 18, f) hyaline with dark grey-brown pigmentation in areola postica and cell *An* extending into distal angle of *Cu*; light grey-brown pigmentation along costal region and distal half of *M* cell; entire *m* vein including its fusion with *s* and *m*1 dark grey-brown, rest of veins light yellowish brown. Hindwing greyish hyaline, veins *r*2+3, *r*1+4, and *an* faint, other veins grey. Legs light grey-brown. Abdomen grey with dark grey-brown apex.
Morphology. I.O.: D. = 1.0: 1. In forewing rs and m fused for a distance, M₁ cell very narrow, areola postica long and flat. Hindwing: \( r_{5+3}, r_{6+5} \) and \( m \) without long setae. Proximal hind tarsal segment with 13 ctenidiothorae; claw without preapical tooth. Genitalia: hypandrium (fig. 20, c) with a pair of pointed apical lobes without accessory sclerites. Penis frame (fig. 19, d); outer parameres convergent; inner parameres fused for a distance, point of fusion serrated; a pair of sclerotized radula rods. Ninth abdominal tergite (fig. 21, e) heavily sclerotized along anterior margin. Paraproct with a field of 10 trichobothria. Epiproct with an apical field of papillae.

Body length (in alcohol): 1.8 mm.

**FEMALE:** Unknown.

**HOLOTYPE,**  ♂  (US 71415), Caroline Is., Palau, Koror, NE, limestone ridge, 40 m, Dec. 14, 1952, Gressitt.

**DISTRIBUTION:** Caroline Is. (Palau).

75. **Pseudoscottiella pallida** Thornton, Lee & Chui, n. sp. (fig. 18, g; 22, c, h)

**FEMALE:** Coloration (after softening in dil. NaOH following 13 years dry storage). Head very pale grey. Eyes and ocelli pale. Antenna (damaged) with flagellum light grey, scape and pedicel slightly lighter. Maxillary palp very pale grey-brown. Thorax very pale grey. Forewing (fig. 18, g) hyaline except a proximal yellow-brown band in areola postica; veins faintly yellow-brown, darkening distally. Hindwing hyaline, veins faint and indistinct. Legs: tibia and proximal tarsal segment grey, rest of leg pale grey. Abdomen very pale grey.

Morphology. I.O.: D. = 3.3: 1. In forewing rs and m fused for a distance; \( r_{5+3} \) and \( r_{6+5} \) rather long; \( R₁ \) cell long and narrow; veins \( m₁ \) and \( m₂ \) distally slightly convergent, areola postica long and flat. In hindwing \( r_{4+5} \) and \( m \) setose. Proximal hind tarsal segment with 14 ctenidiothorae; claw untoothed. Subgenital plate and gonapophyses (except dorsal valve) missing. Dorsal valve (fig. 22, h) lobate, bearing a bristled stylet projecting well beyond lobe. Ninth abdominal tergite (fig. 22, e) with submarginal sclerotized pattern along anterior border. Paraproct with 10 trichobothria.

Body length (in alcohol): 2.6 mm.

**MALE:** Unknown.

**HOLOTYPE,** ♀  (US 71416), Caroline Is., Palau, Koror, NE, limestone ridge, 40 m, Dec. 14, 1952, Gressitt.

**DISTRIBUTION:** Caroline Is. (Palau).

76. **Pseudoscottiella postica** Thornton, Lee & Chui, n. sp. (fig. 19, e; 18, h; 20, f; 21, f)


Morphology. I.O.: D. = 0.6: 1. In forewing rs and m fused for a distance, \( r_{5+3} \) and \( r_{6+5} \) long and distally slightly divergent, \( m₁ \) and \( m₂ \) short; areola postica long and flat, pterostigma long. Hindwing membrane with small fine hairs; \( r_{5+3}, r_{6+5} \) and \( m \) without long setae. Proximal hind tarsal segment with 4 ctenidiothorae; claw untoothed. Genitalia: hypandrium (fig. 20, f) simple, undivided, laterally bearing a small pair of pointed, posteriorly directed sclerotized rods. Penis frame (fig. 19, e) with rather broad lateral sclerites; outer parameres more or less...
parallel; inner parameres united at apex for a distance; with a pair of sclerotized radula rods. Ninth abdominal tergite (fig. 21, f) with anterior band of sclerotization. Paraproct with 10 trichobothria. Epiproct with an apical field of papillae.

Body length (in alcohol): 1.8 mm.

**Female**: Unknown.

**Holotype, ♀ (US 71417), Caroline Is., Yap, Map I., E, Jul.–Aug. 1950, Goss.**
DISTRIBUTION: Caroline Is. (Yap).

77. Pseudoscottiella pseudornatus Thornton, Lee & Chui, n. sp. (fig. 18, i; 19, g; 20, g; 21, g; 22, d,g,k)

Female: Coloration (after softening in dil. NaOH following 13 years dry storage). Vertex, frons, gena and clypeus grey-brown with a lighter area on either side of ocelli, rest of head very light brown. Eyes and ocelli pale. Antenna (damaged) with dark brown scape and pedicel, pale grey flagellum. Maxillary palp very light grey. Thorax dark brown. Forewing (fig. 18, i) dark grey-brown, with three large hyaline areas; veins brown. Hindwing greyish hyaline with brown veins. Legs: femur and trochanter very pale grey, coxa pale grey with a dark grey-brown area, rest of leg grey-brown. Abdomen light brown with dark brown apex.

Morphology. I.O.: D. = 3.5: 1. In forewing rs and m fused for a distance, r_{2+3} and r_{4+5} long and distally divergent; areola postica elongate. Hindwing: r_{2+3}, r_{4+5} and m without long setae. Proximal hind tarsal segment with 14 ctenidiaobothria; claw untoothed. Subgenital plate (fig. 22, g) simple, undivided, bearing 2 pairs of long subapical setae. Gonapophyses (fig. 22, k): ventral valve lobate, with apical stylet bearing spinelets; dorsal valve lobate, subapical stylet long, projecting well beyond lobe and bearing spinelets; outer valve elongated, cylindrical, bearing about 10 long setae. Ninth abdominal tergite (fig. 22, d) with anterior submarginal sclerotized patterns. Paraproct with 10 trichobothria.

Body length (in alcohol): 2.0 mm.

Male: Coloration (after softening in dil. NaOH following 13 years dry storage). Color pattern as female, slightly darker.

Morphology. I.O.: E. = 2.7: 1. Venation of forewing as female. Hindwing and legs damaged and lost. Genitalia: hypandrium (fig. 20, g) medially with field of small spines, incipient lateral lobes. Penis frame (fig. 19, g) peculiar, with a pair of tapering radula rods and a median serrate sclerite. Epiproct (fig. 21, g) with apical field of papillae.

Body length (in alcohol): 1.6 mm.


DISTRIBUTION: Caroline Is. (Palau).

The Pseudoscottiella species from Micronesia differ from those collected from Africa in general in the following features: the areola postica in the forewing is larger and longer, and the branches of the radial fork are longer; the structure of the hypandrium and penis frame (with sclerotized radula rods); the subgenital plate (possessing a well-developed and clearly marked-off apical lobe); the shape of the outer valve of the gonapophyses.

Examination of the species in Micronesia for morphological similarities in order to suggest relationships, leads to an impasse, as so often in archipelago studies unless numerical methods are used and complete overall similarities compared. The characteristics of the species show a mosaic distribution—groups of species which show similarities in one character or group of characters do not fall together if other groups of characters are considered.

Thus, P. bifasciata (Truk), P. circularis (Ponape), P. pseudornatus (Palau)
Figure 22.—Ninth abdominal tergite, epiproct and paraproct of female: a, *Pseudoscottiella* bifasciata; b, *P. circularis*; c, *P. pallida*; d, *P. pseudornatus*; subgenital plate of female: e, *P. bifasciata*; f, *P. circularis*; g, *P. pseudornatus*; female gonapophyses: h, *P. pallida* (dorsal valve); i, *P. bifasciata*; j, *P. circularis*; k, *P. pseudornatus*. Scales a–d = 0.2 mm; e–k = 0.1 mm.
and P. ornatus (Guam) are similar to each other, and differ from other Micronesian species in possessing a well-marked and in general fairly similarly distributed forewing pattern. If, however, male genitalia are considered, then P. ornatus and P. circularis must be grouped together with P. clarkei and possibly P. gressitti in possessing a similarly constructed penis frame, which differs from that of the other species, including P. pseudornatus. On hypandrial characteristics, P. ornatus and P. circularis again show similarity with P. pseudornatus.

In female genitalia, the three species which are sufficiently known are all fairly similar, P. bifasciata and P. circularis being rather closer to each other than either is to P. pseudornatus.

From the evidence available, it can be said that P. fusca (Palau) and P. postica (Yap) are very closely related; that P. ornatus (Guam) and P. circularis (Ponape) are also closely related and show some similarities to P. pseudornatus (Palau) and P. bifasciata (Truk), and a rather more tenuous relationship to P. clarkei (Palau), which stands somewhat apart. The relationships of P. gressitti (Palau) and P. pallida (Palau) are difficult to determine. When more specimens of these and other Pseudocottiiella species are available from Micronesia, including where possible material of both sexes, it should be possible to subject them to a comprehensive and quantitative analysis of overall similarities, which together with distributional data should provide a better basis for suggesting relationships.

**FAMILY ARCHIPSOCIDAE** Pearman, 1936

**CHARACTERISTICS:** Wings setose, venation incomplete, wings often reduced or absent; gonapophyses reduced or absent (if viviparous); tarsi 2-segmented.

**Genus Archipsocus** Hagen


**KEY TO MICRONESIAN SPECIES OF ARCHIPSOCUS**

Macropterous, hindwing without setae on membrane of posterior basal cells; female gonapophyses lacking.................................................................78. dybasi

Macropterous, hindwing posterior basal cells setose, or micropterous; female gonapophyses complete.........................................................79. spinosus

**78. Archipsocus** (Archipsocopsis) dybasi Thornton, Lee & Chui, n. sp. (fig. 23, a, b, h)

**FEMALE:** Coloration (after c. 20 years alcohol storage). Whole insect very pale brown, wings hyaline.
Morphology. Forewing venation (fig. 23, a) as in the following species but veins unpigmented and discerned only with extreme difficulty. Hindwing (fig. 23, b) without setae on membrane of basal cells. Subgenital plate (fig. 23, h) setose, somewhat straight-edged posteriorly. Without gonapophyses. Paraproct without trichobothria in basal rosette sockets, reduced, ciliation sparse.

Body length (in alcohol): 1.6 mm.

**Male**: Unknown.

**Holotype**, ♀ (FM), Mariana Is., Tinian, ridge 1 mile N. of Tinian Harbor,
beating, Apr. 10, 1945, Dybas. Paratype, ♀ (BISHOP), Tinian: Gurgan Pt., beach coves, sifting leaf litter, Apr. 5, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Tinian).

This presumably viviparous species, included in the subgenus Archipsocopsis by virtue of the fact that gonapophyses are absent, differs from *A. intermedius* Smithers in being macropterous, from *A. bifurcatus* Smithers and *A. machadoi* Bad. in forewing venation, from *A. albofasciatus* Bad. and *A. fernandi* Pearman in forewing pattern, from *A. minitus* Bad., *A. balli* Bad., *A. biguttatus* Pearman, *A. bicolor* Bad. and *A. frater* Mockford in coloration and from *A. mendax* Bad. in wing pigmentation and in lacking setae on the membrane of the basal cells of the hindwing.

It resembles *A. aneura* Bad. (Africa) in a number of respects, notably in the reduction, in size and chaetotaxy, of the paraprocts. *A. aneura*, however, has brown forewings; it seems unlikely that this species has faded completely in the 20 years of storage in view of the fact that the following species, after being stored for the same time, still possesses pigmented forewings.

79. **Archipsocus** (*Archipsocus*) **spinusus** Thornton, Lee & Chui, n. sp. (fig. 23, e–g, i–l)

*Macropterus form*

**Female:** Coloration (after c. 20 years alcohol storage). Head and thorax light brown; antennae, maxillary palps and legs somewhat paler; abdomen cream, pale brown laterally. Forewing light brown; hindwing hyaline.

**Morphology.** Forewing (fig. 23c) with veins in apical third not distinguishable, rs and m fused for a long stretch, arcola postica well formed. Hindwing (fig. 23, d) setose in basal cells, venation complete. Subgenital plate rounded, setose, sclerotized area irregularly emarginate antero-mesially (fig. 23, i). Gonapophyses (fig. 23, j) complete, dorsal and ventral valves styliform, outer valves wide, with 10–12 setae along posterior margin. A single trichobothrium on each paraproc.

**Body length (in alcohol):** 1.6 mm.

*Micropterus form*

**Female:** (micropteron). Coloration. As macropteron form.

**Morphology.** As macropteron form except for reduction of wings (fig. 23, e, f) and the fact that there is no trichobothrium on the paraproc with a rosette basal socket.

**Male.** Coloration (after c. 20 years alcohol storage). As female.

**Morphology.** Micropteron, forewing (fig. 23, g) not reaching first abdominal tergite, hindwings absent. Penis frame (fig. 23, k) oval, posteriorly with an inner ring-shaped sclerite. Ninth abdominal tergite each side with a dense field of very stout pointed spines (fig. 23, l).

**Body length (in alcohol):** 1.5 mm.


DISTRIBUTION: S. Mariana Is. (Saipan, Tinian).
This oviparous species with fully developed female gonapophyses differs from all previously described forms notably in the presence on the male ninth abdominal tergite of the two conspicuous fields of stout spines and the peculiar ring-shaped sclerite on the penis frame. The presence of setae on the membrane of the basal cells of the hindwing, a trichobothrium on the paraproct, and a pale abdomen and light brown head and thorax, also serve, either separately or in combination, to distinguish it from other described species.

**Family Myopsocidae** Enderlein, 1903

**Characteristics:** In forewing areola postica fused to media for a short distance or connected to it by a short crossvein; forewings glabrous, often mottled with more or less irregular and confluent brown spots; gonapophyses complete, with very long thin dorsal valve; tarsi 3-segmented.

**Key to Micronesian Genera of Myopsocidae**

Apex of forewing with posterior margin incurving between apices of veins...*Lophosterygella*

Forewing margin normal...........................................*Myopsocus*

**Genus Lophosterygella** Enderlein

*Lophosterygella* Enderlin, 1907, Notes Leyden Mus. 29: 121.

**80. Lophosterygella cineticornis** Thornton, Lee & Chui, n. sp. (fig. 24, a; 25, c; 26, a, f)

**Female:** Coloration (after c. 20 years alcohol storage). Head buff, vertex flecked with fairly small distinct brown spots, in usual pattern. Frons medially with two pairs of spots, a narrow brown line along posterior border and a wider curved brown line just mesial to antennal sockets. Clypeus with converging striae of separate brown spots. Genae unmarked, except a brown line below orbit, another below antennal socket, a third along distal edge of gena. Eyes black; ocelli very dark brown along inner margins. Antennae buff, scape and pedicle flecked with brown, basal flagellar segment with alternating buff and brown stretches, eight brown stretches in all, these longer apically, second segment with seven rather longer brown stretches, third segment with five, succeeding segments with longer and fewer brown stretches. Maxillary palps buff, tip of apical segment brown. Thoracic terga generally buffish brown, a darker brown median line along dorsum of thorax. Pleura buff, a narrow irregular brown line above coxae. Legs buff. Forewing (fig. 24, a), similarly patterned to that of *L. camelina*. Hindwing without any apparent banding on margin. Abdomen cream, dark grey-brown transverse bands dorsally, widening laterally, ventrally four such bands on basal portion, fusing laterally; abdomen cream laterally.

Morphology. I.O.: D. = 4.0:1, occiput mesial to orbits raised into rounded humps, a median depression. Clypeus prominent, bulging. Basal hind tarsal segment with 24 ctenidio-bothria. Forewing with anal flap (fig. 24, a). Subgenital plate (fig. 25, c) with a pair of longitudinal sclerotized ridges, margin with a pair of small, fairly wide-set lobes. Gonapophyses (fig. 26, a). A field of 29 trichobothria and a prominent band of setae on each paraproct (fig. 26, f).

Body length (in alcohol): 2.0 mm.

**Male:** Unknown.

Holotype, ♀ (FM), Mariana Is., Tinian, Lake Hagoi, beating, Apr. 4, 1945, Dybas.
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![Image](image.png)

**Figure 24.**—Forewing (female): a, *Lophopterygella cincticornis*; b, *Myopsocus clunius*; c, *M. palauensis*; d, *M. punctatus*. Scales = 0.5 mm.

**DISTRIBUTION:** S. Mariana Is. (Tinian).

This species is similar to *L. camelina* End., which occurs in Taiwan, the Philippines, and Java. It differs, however, in the subgenital plate (that figured by Enderlein having smaller, more closely adjacent apical lobes), and in the markings of the flagellar segments, those of *L. camelina* having but a single apical brown band per segment.

Other species of this genus are reported from China (*L. lunata* Navas), Pemba (*L. bursulipennis* End.), Haiti (*L. haitiensis* Banks), and the United States (*L. lichenatus* (Walsh)). Another species occurs in Fiji, as yet undescribed.

**Genus Myopsocus** Hagen


The species below are provisionally assigned to the genus *Myopsocus* sens. lat. (see discussion by Smithers, 1964, *Proc. R. Ent. Soc. Lond. (B)* **33**: 133).

**Key to Micronesian Species of Myopsocus**

1. Dark oblique band in basal half of forewing narrowing posteriorly to a quarter its anterior width; female subgenital plate with club-shaped apical process carrying 2 long and about 8 short setae.........................................................84. *punctatus*
   
   Dark oblique band in basal half of forewing narrowing posteriorly to no less than half its anterior width; female subgenital plate apical process not club-shaped, not bearing setae of two distinct lengths.........................................................2

2. Female subgenital plate apical process gradually narrowing to apex which bears a pair of setae; penis frame ring-like, oval.........................................................82. *clunius*
   
   Female subgenital plate apical process 2-pronged apically, with a number of short setae at base of fork; penis frame broad basally, very narrow in apical half...83. *palauensis*
81. **Myopsocus bakeri** Banks


**DISTRIBUTION**: Philippines, S. Mariana Is. (Guam).

S. MARIANA IS. GUAM: Tarague, May 1936, Swezey and Usinger (Banks 1942).

This record by Banks is questionable.

82. **Myopsocus clunius** Thornton, Lee & Chui, n. sp. (fig. 24, b; 25, d; 26, d; 27, e,g)

**Female**: Coloration (after 24 years dry storage). Not clearly discernible, apart from: forewing (fig. 24, b) similar to those of *Myopsocus palauensis* and *M. punctatus*, except that basal dark patch is different in shape; hindwing with costa clearly banded only distal to apex of vein r; hind leg femur brown, tibia light brown, darker apically, basal tarsal segment light brown, distal segments dark; abdomen with dark transverse bands dorsally, these often interrupted each side of mid-line; eyes grey, mottled with dark brown.

**Morphology**. I.O.: D. = 2.0: 1. Basal hind tarsal segment with 18 ctenidiobothria. Subgenital plate (fig. 25, d) apical process without subapical setae, with a pair of fairly short

![Figure 25](image-url)

**Figure 25**.—Hindwing (female): a, *Myopsocus punctatus*; b, *M. palauensis*; female subgenital plate: c, *Lophopterygella cinetecoris*; d, *M. clunius*; e, *M. palauensis*; f, *M. punctatus*. Scales a–b = 0.5 mm; c–f = 0.2 mm.
straight setae apically, disc distinctly sclerotized. Gonapophyses (fig. 26, d). A field of 20 trichobothria on each paraproct.

Body length (after softening in alcohol): 2.0 mm.

**MALE**: Coloration (after c. 24 years dry storage). As female.

Morphology. **I.O.: D. = 0.8:1. Basal hind tarsal segment with 19 ctenidiobothria, Pearman's organ present. Genitalia: hypandrium (fig. 27, c) simple, with an apical sclerotized flap, a subapical pair of very long setae, a similar seta each side of hypandrium close to a field of smaller setae. Penis frame (fig. 27, e). Epiproct dorsally with a pair of projecting processes posterior to a raised spinous area. A field of 21 trichobothria on each paraproct, apical hook (fig. 27, g) narrow, sclerotized on mesial edge, bare at apex.

Body length (after softening in alcohol): 1.9 mm.

**Holotype, ♀ (KU), Pata I., Truk, Caroline Is., Sabote-Epin, Apr. 9, 1940, Yasumatsu and Yoshimura. Allotype, ♂ (KU), Truk, Pata I., Sabote, Apr. 4, 1940, Yasumatsu and Yoshimura. Paratypes, Saipan: Garapan-Sadog Tasi, May 5, 1940, Yasumatsu and Yoshimura; As Mahetog area, at light, May 1–6, 1945, Dybas. Additional specimen, Truk: Moen I., Teroken, 70–60 m, Feb. 1, 1953, Gressitt.**

**DISTRIBUTION**: S. Mariana Is. (Saipan); Caroline Is. (Truk).

This species is closely related to *M. incomptus* Smithers and *M. furcatus* Smithers from Australia, which have the same type of penis frame and epiproct ornamentation. *Philotodes griseipennis* (McLachlan) and *M. hickmani* Smithers, also from Australia, are apparently also related, though more distantly, to this group of forms, as is the only extra-Australian representative so far described, *Rhaptonera eatoni* (McLachlan) from North Africa and Europe.

The specimens from Saipan differ in some ways from those captured on Truk. The Saipan male has narrower wings and different wing pattern (fewer brown spots), while one of the Saipan females has but a single seta on the apical process of the subgenital plate, the wings being as those of the females from Truk. Whether these differences warrant a subspecific separation of the Truk and Saipan forms cannot be decided on the basis of the few specimens available at the present time.

**83. Myopsocus palauensis** Thornton, Lee & Chui, n. sp. (fig. 24, c; 25, b,e; 26, b,e; 27, a,d,h)

**FEMALE**: Coloration (after c. 10 years dry storage). Vertex with irregular brown markings dorsally, fewer anteriorly, an isolated median small brown mark posterior to ocellar protuberance and about same size, a line of merging spots from orbit towards occellar protuberance. Frons similarly mottled with brown marks, brown round antennal bases, line of merging brown spots from posterior edge of antennal socket towards occellar protuberance fusing with similar line on vertex, another line from anterior edge of antennal socket along fronto-clypeal suture. Clypeus pale, converging striae discernible antero-laterally. Labrum dark brown. Genae pale, mottled brown particularly near sutures. Eyes grey, mottled with small dark brown marks which tend to form irregularly bent antero-posterior lines. Ocelli pale, dark brown inner margins. Maxillary palp pale, apical segment wholly dark brown. Antennae buff, two basal flagellar
segments dark brown for apical sixth of their lengths, third and fourth very pale basally, darker sub-basally and apically, succeeding segments dark except for basal pale stretch. Thoracic terga pale brown, except anterior of mesothoracic antedorsum and dorsal lobes dark brown. Pleura brown. Legs: pro- and meso-femora with three brown transverse bands, hind femur with but one subapically; tibiae brown, very dark brown apically; basal tarsal segment pale brown, dark brown apically except on hind tarsus, distal tarsal segments dark brown. Forewing (fig. 24, c) mottled in various shades of brown, extent of hyaline areas in apical half of wing somewhat variable. Hindwing (fig. 25, b) very pale fuscous, costa with light and dark stretches. Abdominal color not discernible.

Morphology. I.O.: D. = 1.8:1. Basal hind tarsal segment with 23 ctenidiobothria; claws sharply bent with preapical tooth a long way from apex; Pearman's organ present. Forewing venation as figured. Subgenital plate (fig. 25, c) apical process with a few short sharp...
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setae sub-distally, two long curved setae distally. Gonapophyses (fig. 26, b) A field of 21–22 trichobothria on each paraproct, apical hook (fig. 26, c) narrow, serrate on mesial surface, with minute setae at apex.

Body length (after softening in alcohol): 2.3 mm.

Male: Coloration (after c. 10 years dry storage). As female except pterostigma in forewing somewhat darker, and hyaline patches in apical half of forewing less extensive.

Morphology. I.O.: D. = 0.5: 1, eyes very large. Basal hind tarsal segment with 21 ctenidiobiorthia; claws as female; Pearman’s organ present. Genitalia: hypandrium (fig. 27, a) fairly simple, but with minute tubercles posteriorly, a larger pair in middle of posterior margin. Penis frame (fig. 27, d) of an unusual shape for this family. Epiproct beset with small tubercles as those on hypandrium (fig. 27, h). Paraproct (fig. 27, h) with a field of 20 trichobothria.

Body length (after softening, in alcohol): 2.0 mm.


DISTRIBUTION: Caroline Is. (Palau).

This species is similar in subgenital plate to Phlatodes angolensis Badonnel, from Africa; although the penis frame is quite different, the hypandria of the two species also show marked similarities. A species with a penis frame of a somewhat similar type occurs in Fiji.

84. Myopsocus punctatus Thornton, Lee & Chui, n. sp. (fig. 24, d; 25, f; 26, c; 27, b, f, i)

Female: Coloration (after c. 20 years alcohol storage). Vertex mottled with brown marks, these darker and closer each side of median suture. Frons with a narrow curving line from each side of ocellar protuberance to a dark spot postero-mesial to antennal socket, a short dark transverse line just anterior to this dark spot, two fainter spots medially near anterior border of frons. Clypeus with convergent striae of confluent spots. Genae with angular brown line from underside of orbit to anterior edge of antennal socket, rest of genae mottled brown, except in distal quarter. Eyes grey with dark brown mottling, ocelli heavily margined dark brown on inner edges. Antenna pale brown, each flagellar segment with a short paler section extremely distally. Maxillary palpae pale brown, apical segment darker in distal half. Thoracic terga brown, broad pale buff arrow-head mark on antedorsum of mesothorax, other terga widely bordered buff. Pleura of mesothorax pale brown, those of metathorax buff. Legs pale buff, except tibiae darker distally, two distal tarsal segments brown. Forewing (fig. 24, d) very similar to that of Myopsocus palaunensis in apical half, but differs in shape of the dark oblique transverse band in basal half. Abdomen with grey-brown dorsal and lateral bands, much fainter ventral bands.

Morphology. I.O.: D. = 2.0: 1. Basal hind tarsal segment with 21 ctenidiobiorthia; claws with prominent preapical tooth; Pearman’s organ present. Subgenital plate (fig. 25, f) apical process with a pair of straight fairly short setae apically, beset with shorter finer straight setae subapically. Gonapophyses (fig. 26, c). A field of 21 trichobothria on each paraproct.

Body length (in alcohol): 2.6 mm (3 specimens, 2.5–2.8 mm).

Male: Coloration (after c. 20 years alcohol storage). As female, but abdominal bands not visible dorsally.

Morphology. I.O.: D. = 1.0: 1. Basal hind tarsal segment with 18–20 ctenidiobiorthia;
Figure 27.—Hypandrium: a, *Myopsocus palaensis*; b, *M. punctatus*; c, *M. clunius*; penis frame: d, *M. palaensis*; e, *M. clunius*; f, *M. punctatus*; male terminalia: g, *M. clunius*; h, *M. palaensis*; i, *M. punctatus*. Scales = 0.2 mm.
claws and Pearman’s organ as female. Genitalia: hypandrium (fig. 27, b) with a median and each side a lateral shallow rounded lobe, a pair of long setae on median lobe, a field of short setae and one long one in association with each lateral lobe. Penis frame (fig. 27, f). Epiproct without dorsal processes. A field of 23 trichobothria on each paraproct, apical hook (fig. 27, i) broad, bare at tip.

Body length (in alcohol): 2.2 mm (3 specimens, 2.0–2.3 mm).


DISTRIBUTION: S. Mariana Is. (Saipan, Tinian, Guam), Caroline Is. (Lamotrik), Marshall Is. (Jaluit).

This species can be distinguished from the other two described in this work on the general pattern of the basal half of the forewing. Although there is variation of the detailed shape of the dark oblique band within the species, its general shape is constant, and differs from each of the other species. The genitalia are quite distinct, though closest to those of Myopsocus clunius, the male genitalia in particular resembling the Australian forms mentioned under that species. A species with very similar male genitalia occurs in Fiji.

FAMILY PSOCIDAE Stephens, 1892

CHARACTERISTICS: In forewing areola postica fused to media, gonapophyses complete and well developed; hypandrium of male often complex; tarsi 2-segmented.

Genus Ptycta Enderlein


KEY TO MICRONESIAN SPECIES OF PTYCTA

1. Cells R and Cu in forewing without brown patches......................................................2
   Cells R and Cu in forewing with brown patches.....................................................3

2. Thoracic terga very dark brown, shining........................................................................89. nitens
   Thoracic terga pale brown, not shining.......................................................................85. angulata

3. Forewing with brown pigments over rs-m junction............................................90. parvula
   Forewing rs-m junction without pigment...................................................................4
4. Apical vein (m) of discoidal cell of forewing without pigmented cloud, transverse fascia almost continuous...........................................87. *marianensis*

Apical vein (m) of discoidal cell of forewing with pigmented cloud, transverse fascia interrupted ............................................................5

5. Forewing with a cloud of brown pigment across cell M1, near margin, pterostigma with brown pigment within its borders except at vertex, more than half its area pigmented.................................................................86. *maculata*

Forewing without a cloud of brown pigment across cell M1, pterostigma only pigmented in distal quarter.................................................................88. *micromaculata*

85. *Ptycta angulata* Thornton, Lee & Chui, n. sp. (fig. 28, e; 29, b; 30, b; 31, b; 32, f)

**Female:** Coloration (after c. 20 years storage in alcohol). Head generally cream, brown vertex markings sparse, median epicranial suture dark; an inverted brown chevron in middle of frons, a brown line from antennal socket to ocellar protuberance, a short brown transverse line each side of median chevron. Clypeal striae very faint, darker for a short section forming a transverse band across clypeus. Eyes black; ocelli pale, dark brown inner margins. Antennae pale brown, maxillary palps cream. Thoracic terga pale brown, widely bordered cream, except anterior face of mesothoracic antedorsum dark brown. Pleura pale brown. Legs: coxa and apical tarsal segment pale brown, otherwise cream. Forewing (fig. 28, e) with small discreet brown patches, hindwing hyaline. Abdomen cream, diffuse grey-brown granulated pigment laterally.

**Morphology** I.O.: D. = 3.5:1. Thoracic terga not shining. Number of ctenidiobothria on hind tarsal segments: 20; 2 + 1. Pearman’s organ complete. Subgenital plate (fig. 30, b) with narrow straight bands of sclerotization on disc. Gonapophyses (fig. 29, b): ventral valve very short; dorsal valve narrow, tapering throughout its length; outer valve without a posterior lobe.

**Body length** (in alcohol): 1.8 mm (10 specimens, 1.5–2.1 mm).

**Male:** Coloration (after c. 15 years alcohol storage). As female.

**Morphology.** I.O.: D. = 1.0:1. Thoracic terga and Pearman’s organ as female. Number of ctenidiobothria on hind tarsal segments: 22; 2 + 1. Genitalia: hypandrium (fig. 32, f) asym-

![Figure 28](image_url)

**Figure 28.** Forewing: a, *Ptycta nitens*; b, *P. micromaculata*; c, *P. maculata*; d, *P. marianensis*; e, *P. angulata*; f, *P. parvula*. Scales = 0.5 mm.
metrical, median tongue with three distinct teeth on right margin, two on left. Penis frame (fig. 31, b) broad and angular anteriorly, posterior tine short. A field of 22 trichobothria and an apical, abruptly hooked spine on each paraproct. Posterior dorsal lobe of epiproct very finely tuberculate.

Body length (in alcohol): 2.2 mm (10 specimens, 2.0–2.4 mm).


DISTRIBUTION: S. Marianas Is. (Saipan, Tinian, Guam), Caroline Is. (Eniwetok, Kusaie), Marshall Is. (Majuro, Taka, Ujae, Jaluit).

This rather pale species, which has quite distinctive genitalia, occurs in the S. Marianas, and in the eastern Carolines and Marshalls, but has not been taken on the high islands of the West or Central Carolines.

86. Ptycta maculata Thornton, Lee & Chui, n. sp. (fig. 28, c; 29, d; 30, d; 31, e, h; 32, d)

Female: Coloration (after c. 15 years dry storage). Head cream, usual vertex marks faint brown. A brown line along vertex-frons suture from ocellar protuberance to antennal socket. Frons with large triangular median brown patch. Clypeal striae faint. No markings discernable on genae. Eyes black; ocelli pale, not with dark margins. Antennae lacking. Maxillary palp pale except apical segment dark brown. Thoracic terga brown, darker on anterior face of mesothorax. Pleura brown. Forewing (fig. 28, c) with numerous dark brown patches, apices of veins cloudy, a cloud of brown pigment across cell M₁ near margin. Hindwing nyaline, faint cloudiness in apical angle of cell Cu₅. Legs: coxa and apical tarsal segment dark brown, basal tarsal segment brown; tibiae very pale brown, brown apically; femur cream, pale brown on
outer apex; trochanter cream. Abdominal color not discernible.

Morphology. I.O.: D. = 3.0: 1. Hindwing with 4 fine marginal setae. A very short spur-vein at vertex of pterostigma. Number of ctenidiobothria on hind tarsal segments: 22; 2 + 1. Pearman's organ complete. Subgenital plate (fig. 30, d). Gonapophyses (fig. 29, d) with outer valve having small distinctly shaped posterior lobe. Spermapore plate (fig. 29, d) well sclerotized. A circular field of 21 trichobothria and 3 setae not in rosette sockets on each paraproct.

Body length (in alcohol): 2.4 mm.

Male: Coloration (after c. 15 years dry storage). As female, but brown patches on forewing less extensive.

Morphology. I.O.: D. = 1.2: 1. Hindwing with 2 or 3 fine marginal setae. Spur-vein on pterostigma very short or lacking. Number of ctenidiobothria on hind tarsal segments: 20–21, 2 + 1. Pearman's organ complete. Genitalia: hyandrium (fig. 32, d) symmetrical, three widespread stout pointed teeth each side of median tongue, apical one stoutest and blunt-test, beyond this two or three smaller close-set serrations. Penis frame (fig. 31, e) rounded anteriorly, tapering evenly posteriorly to wide, blunt, apical tine beset with minute pointed tubercles. A field of 17–18 trichobothria and an evenly curved apical spine on each paraproct. Dorsal lobe of epiproct (fig. 31, h) with distinct sclerotized boundaries, the posterior one finely tuberculate.

Body length (in alcohol): 1.9 mm.


DISTRIBUTION: Caroline Is. (Ponape).

This distinctive species is apparently confined to Ponape. The hyandrium somewhat resembles that of Ptycta parvula but the penis frame and wing pattern are quite different.

87. Ptycta marianensis Thornton, Lee & Chui, n. sp. (fig. 28, d; 29, e; 30, e; 31, e,g; 32, e)


Body length (in alcohol): 2.3 mm.

Male: Coloration (after c. 20 years alcohol storage). As female, but pigmented fascia lacking in forewing.

Morphology. I.O.: D. = 2.0: 1. Thoracic terga as female. Number of ctenidiobothria
on hind tarsal segments: 21–22; 2 + 1. Pearman's organ complete. Hindwing with 5–6 stout marginal setae. Genitalia: hypandrium (fig. 32, c) symmetrical, median tongue with many marginal teeth. Penis frame (fig. 31, c) wide and rounded anteriorly, narrowing posteriorly to a fairly long, broad apical tine. A field of 21 trichobothria and a long, fairly straight spine on each paraproct. Posterior lobe of epiproct with fairly large tubercles (fig. 31, g).

Body length (in alcohol): 2.1 mm (10 specimens, 1.8–2.4 mm).

DISTRIBUTION: S. Mariana Is. (Saipan, T'nian, Guam).

88. Ptycta micromaculata Thornton, Lee & Chui, n. sp. (fig. 28, b; 29, e; 30, e; 31, f, i; 32, e)

Female: Coloration (after e. 7 years alcohol storage). Head largely buff, usual markings on vertex and frons brown, clypeal striae very faint except medially, forming darker band in mid-line of clypeus. Eyes black; ocelli with dark brown inner borders. Antennae pale brown; maxillary palps brown, apical segment darker. Thoracic terga pale, anterior of mesothoracic antedorsum and posterocephal portion of dorsal lobes brown, dorsal lobes of metathorax with more extensive brown pigment. Pleura brown. Legs: pale brown apart from brown coxae. Forewing (fig. 28, f) with small discreet brown patches. Hindwing faintly infuscate at distal angle of cell Cu4. Abdomen buff, grey-brown granulation dorsally.

Morphology. I.O.: D. = 3.5: 1. Thoracic terga dull. Number of ctenidiobothria on hind tarsal segments: 22; 2 + 1. Pearman's organ complete. Subgenital plate (fig. 30, e) apical lobe as broad as long, sclerotized area of disc narrow. Gonapophyses as in fig. 29, e. Spermapore plate (fig. 29, e) with sclerotized anterior folds. A field of 21 trichobothria on each paraprost.

Body length (in alcohol): 2.5 mm.

Male: Coloration (after c. 14 years alcohol storage). Not distinguishable, faded, except forewing marked as female.

Morphology. I.O.: D. = 1.0: 1. Thoracic terga dull. Number of ctenidiobothria on hind tarsal segments: 20; 2 + 1. Pearman's organ complete. Genitalia: hypandrium with toothed margin to median tongue (fig. 32, c). Penis frame (fig. 31, f) with fairly long apical projection. A field of 22 trichobothria and a large curved spine on each paraproct. Posterior lobe of epiproct only sparsely and finely spinous (fig. 31, i).

Body length (in alcohol): 1.5 mm, smaller than female.

Figure 30.—Female subgenital plate: a, Ptycta nitens; b, P. angulata; c, P. marianensis; d, P. maculata; e, P. micromaculata. Scales = 0.1 mm.

DISTRIBUTION: Bonin Is. (Chichi Jima).

This species is fairly distinctive in wing pattern, the markings being discreet
and well-marked. The female gonopore plate is quite different from that of any Micronesian species.

89. **Ptycta nitens** Thornton, Lee & Chui, n. sp. (fig. 28, a; 29, a; 30, a; 31, a; 32, a, b)


   **Morphology.** I.O.: D. = 1.5:1. Thoracic terga glossy. A short spur-vein at vertex of pterostigma. Hindwing with 4 to 7 fine marginal setae. Number of ctenidiobothria on hind tarsal segments: 26 to 27; 3 + 1 to 4 + 1. Subgenital plate (fig. 30, a). Gonapophyses (fig. 29, a); ventral valve fairly long; dorsal valve abruptly narrowing to fine pointed apex; outer valve with sharply truncate posterior lobe. A field of 23 trichobothria on each paraproct.

   **Body length (in alcohol, after softening):** 1.5 mm.

   **Male:** Coloration (after c. 12 years dry storage). As female, but genae wholly yellowish buff.

   **Morphology.** I.O.: D. = 0.6:1. Thoracic terga and pterostigma as female. Hindwing with 2–8 fine marginal setae. Number of ctenidiobothria on hind tarsal segments: 25 to 28; 2 + 1 to 3 + 1. Genitalia: hypandrium (fig. 32, a) symmetrical, median tongue with fine, blunt, closely set marginal teeth, each side of this a sclerotized ridge bears a series of larger serrations (paratype, fig. 32, b). Penis frame (fig. 31, a) of distinctive shape, with prominent "shoulders" and a long lightly sclerotized apical line bearing minute pointed spines. A field of 24 trichobothria and smoothly curved apical spine on each paraproct. Posterior lobe of epiproct closely set with fairly large pointed tubercles.

   **Body length (in alcohol):** 1.4 mm.


   **DISTRIBUTION:** Caroline Is. (Palau, Truk).

   This large species, easily distinguished by the very dark polished thorax is quite distinct in male genitalia and in the outer valve of the female gonapophyses from any other Micronesian species. In all specimens examined, a distinct spur-vein is present at the vertex of the pterostigma.

90. **Ptycta parvula** Thornton, Lee & Chui, n. sp. (fig. 28, f; 31, d; 32, g)

   **Male:** Coloration (after c. 8 years alcohol storage). Head markings not discernible. Antennae and maxillary palps lost. Eyes black; ocelli black, dark brown inner margins. Thoracic terga brown, pleura brown. Legs: coxa, tarsal segments and distal end of tibia brown, other-
Figure 32.—Hypandrium: a, b, Pycsta niens; c, P. marianensis; d, P. maculata; e, P. micromaculata (hypandrial tongue only); f, P. angulata; g, P. parvula. Scales = 0.1 mm.


Morphology. I.O.: D. = 0.8: 1. Number of ctenidiobothria on hind tarsal segments: 18; 2 + 1. Pearman’s organ complete. Hindwing with 2 fine marginal setae apically. Genitalia: hypandrium (fig. 32, g) symmetrical, three prominent teeth on each margin of median tongue. Penis frame (fig. 31, d) angular basally, apical spine very short. A field of 19 trichobothria and a large abruptly hooked apical spine on each paraproct. Posterior dorsal epiproct lobe finely tuberculate.

Body length (in alcohol): 1.5 mm.

Female: Unknown.

Holotype, ♂ (US 71422), Caroline Is., Palau, Babelthuap, Ngiwal, at light,
Thornton, Lee & Chui—Pscoptera


DISTRIBUTION: S. Mariana Is. (Guam), Caroline Is. (Palau).

This small species is clearly similar to Ptycta angulata from the Marianas, Eastern Carolines and Marshalls; the male genitalia and wing patterns of the two species are very similar. Ptycta parvula may be distinguished by the rather more extensive wing markings, the brown thorax, and the symmetrical hypandrium.

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