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The Hoplopleurid Lice of the Indo-Malayan Subregion
(Anoplura: Hoplopleuridae)

Phyllis T. Johnson

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The Hoplopleurid Lice of the Indo-Malayan Subregion
(Anoplura: Hoplopleuridae)

Phyllis T. Johnson
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Abstract

The species of hoplopleurid sucking lice of the Indo-Malayan Subregion are discussed from the standpoint of their host and relationship with their vertebrate and invertebrate hosts. The species are described in the subfamily Hoplopleurinae, and the following genera are described: Hoplopleura, Diastepus, and Podoplypus. All species are deposited in the collections of the British Museum (Natural History) and in the Ferris collection, Museum of the American Museum of Natural History.

Introduction

This paper presents the available information on members of the anophthalmic family Hoplopleuridae from the Indo-Malayan Subregion of the Orient. The Oriental Region is characterized by its large number of species and genera of extant and extinct forms. The family includes the Malayan Peninsula, Java, Sumatra, Borneo, and the Philippines. The Indo-Malayan Subregion includes the Malayan Peninsula, Java, Sumatra, Borneo, and the Philippines. The host species from which the lice are collected are Malayan, Bornean, and Indonesian.

The family Hoplopleuridae includes the typical sucking lice of various mammals, including the rodents, monkeys, and lower primates. The genus Pediculus (Gervais from coelocerophyllum primatium) is not included in the present discussion. In Ferris (1951) it is listed as the only in¬cluded genus in the subfamily Pediculinae. The author of the Hoplopleuridae family opinion the differences between Pediculus and typical sucking lice are probably more important than the similarity. Hanabusa (1951) from the demapathic Cyphophus also included in Hoplopleuridae by Ferris (1951). The zoologically inadequate original description of the species of its only included species, H. palaeontologique Moberg, gave nothing which argued against its placement among the hoplopleurids. The types of H. palaeontologique Moberg, which are described in the present paper, were not collected. By happy chance, Dr. R. E. Kuntz, NAMAU, Formosan mous at U. S. Naval Medical Center, Bethesda, Maryland, made a small collection of ectoparasites in British North Borneo in 1950. The collection included specimens of H. palaeontologique Moberg, which is the only species of its kind in Borneo. These specimens were the only specimens in the collection. In addition, specimens were taken from various mammals, including the rodents, monkeys, and lower primates. The genus Pediculus (Gervais from coelocerophyllum primatium) is not included in the present discussion. In Ferris (1951) it is listed as the only included genus in the subfamily Pediculinae. The author of the Hoplopleuridae family opinion the differences between Pediculus and typical sucking lice are probably more important than the similarity. Hanabusa (1951) from the demapathic Cyphophus also included in Hoplopleuridae by Ferris (1951). 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collectors, and probably are much more abundant than records suggest. Four species have been de-
scribed from Indomalayan sources.

Enderleinella humadai Kuroko

Enderleinella humadai Kuroko 1954, 44, figs. 1, 2;
Johnson 1959, 575, figs. 6-9.

Enderleinella humadai was based on the male holotype, a female allotype, and a series of male and
female paratypes: collected from Callichirus ex-
clusus thailandicus, Oshika, Japan. The species is
nearly identical to Fornasaia, but had escaped from
a zoo. Johnson (1959) restricted this species from
Callichirus fulgaroides and Callichirus sp. from
Narathiwat and Chalawan provinces, Thailand.

In the Malayan-Bornean region, one female of E.
humadai was taken from Callichirus mosquitus (E-1918); Ranau, North Borneo, a second female from
C. punctatus (E-1914d, Ranau), a male from C.
perpositus (E-19203, Mt. Kinabalu, North Borneo),
and one male and two females from Gephyroptera
(E-19280, Mt. Kinabalu), and two females from C.
solitarius (E-42556, Selangor, Malaya). The hosts all
are tree squirrels. From representatives of this
closest affiliated genera, it seems that the host spec-
trum of E. humadai is probably more common than
records would indicate since these squirrels are
overlooked in the literature. Other Enderleinella spec-
s are known from Asia and Borneo. The number of
species may be separated from other Indomalayan
Enderleinella by one or more of the following
characteristics: paragittal plates are present on
segments 2-4, plate II has one apical plate, and plates
III-VI have two apical plates: spicules are present on
segments 3-5.

Enderleinella larici Férès

Enderleinella larici Férès 1920 (dated 1919), 17, figs.
7, 8; Férès 1911, 167.

The type series (holotype, a male) is from the skin
of a Larix sibirica (Siberian larch), Lening-
draud, Southwest Russia (U.S.N.M.). It has not
been reported as described and was not collected
during the present survey.

E. larici is distinguished from other Indomalayan
Enderleinella species by a combination of hav-
ing paragittal plates present only on abdominal
segments 2-4; with plates II and IV lacking apical
plates, while plate III has one apical plate. Also,
the head shape is a distinctive postangular angle.

Enderleinella malayensis Férès

Enderleinella malayensis Férès 1919 (dated 1918), 12,
figs. 4a, 5f; Wenzel 1927, 262, 263; Férès 1921, 150;
Johnson 1959, 575, figs. 6-9.

E. malayensis was described from the holotype male,
allotype female, and a large number of para-
types: all from skins in U.S.N.M. The holotype was
taken from the skin of a timor macaque (Macaca
arae)

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(continued from page 69)

2(1) First sternal plate of abdominal segment 3 not
extended laterally to meet the corresponding
paragittal plate; female lacking abdominal
plates on segments 4-6. (fig. 29) diaphora

2(2) First sternal plate of segment 3 articulated
with the corresponding paragittal plate; four
males with plates on abdominal segments 4-6
(fig. 28).

3(2) First sternal plate of segment 3 with the lateral
platelet on only slightly larger than other
abdominal segment (fig. 25); apical lobes of
paragittal plate on segments 4, 5, 6, narrow. (fig. 35)
malaysiana

3(2) Lateral platelet of first sternal plate of segment
3 enlarged (fig. 28); apical lobes of paragittal
plates on segments 4, 5, 6, not apically narrow,
(fig. 35)

4(3) Postanal area of head extremely broad;
paragittal plate VIII with two long apical
lobes, apex of abdomen of female with eight
stout setae on any prolongation of the exopre-
skeletal portion. Not as above

5(4) Postanal area of head marginally convex,
postanterior margins angled (fig. 17); no wind-
swelled setae on abdomen (fig. 18).

5(4) Paragittal plate VIII with a narrow dorsomesial
lobe (fig. 19). seta

5(4) Paragittal plate VIII with a narrow dorsomesial
lobe (fig. 18). seta

P. pacifica

Description—Antennae five-segmented, not
strongly sexually dimorphic although the male
may have enlarged dorsal setae on segment 3 and
sometimes segment 4. Segments 4-5 may be
large and contiguous or small and separate. Theoretical
sternal plate present. First pair of legs small with
shorter claws; second pair much longer, but third
pair much larger, much flattened and with a very
flat flattened claw, this pair of legs never with
blackish extension. Paragittal plates usually well
developed, those of segment 2 never produced into large Modelloidea extension, divided
inside small dorsal part and larger ventral parts
bearing (the small dorsal part may actually be the
paragittal plate of the first abdominal segment).
Paragittal plates always showing tendency for
partial division into two parts by reason of a longmedial umbilical extension. Functional spicules
present on segments 3-7. Always with indication
of a small triangular plate ventrally on abdomen between posterior extremities of the hind
scapes. Both sexes with second tergal row of seta
2 and 3 (two rows on this segments and first ter-
agal row of seta 3) with setae arranged in lateral
medial groups of two each on either side, so that
median part between groups is large; never with these setae arranged in lateral groups
modified in shape, usually with these setae longer and thinner than other
setae on dorsum of abdomen. Sternal plate of seg-
ment 2 extended laterally to articulate with, or
approximate, the corresponding paragittal plates.
First sternal plate of segment 3 usually but not al-
ways articulating with ventral plates III and IV
bearing two groups of 2-4 enlarged stout setae.
Usually, but not always, female with three rows
of setae on each of the typical segments dorsally
and ventrally: male with one row on each
typical segment dorsally and two ventrally.
There are about 35 described members of Hop-
loma with a few species occurring in the
Malayan and hystiorhodops rodents, but the majority
occur on myomorph rodents from all parts of the
world. Seven species, three of which are new, are
found in the Indomalayan subregion.

P. pacifica

(Feris, 1913, 9, 10, 11, 13)

P. pacifica occidentalis Feris 1921, 82 (female); Fer-
is 1912, 121 (paratypes); Feris 1917, 274; Feris
1921, 132 (paratypes).

P. pacifica var. pacifica Wenzel 1927, 9, figs. 8b; Johnson 1959, 577.

The type series of H. pacifica consists of five males and seven females collected from Rattus cranii hainanensis, Hawaiian Islands. The types are in the Bernice P. Bishop Museum, Honolulu.

H. pacifica is a typical parasite of Rattus rattus
spp., and the parasites were taken from these
animal in the Australian and Oriental regions. It
was collected in large numbers from Rattus rattus
nigerrimus (4 collections), R. r. fuscus (14 collec-
tions), R. r. pectoralis (4 collections), and R.
r. plan (4 collections) from Selangor and Palm
Jorak, Malaya. Apparently it occurs naturally also
on Rattus rattus (4 collections from Selangor). R.
australis is closely related to R. rattus. In Bangkok,
R. pacifica was found only twice, from Rattus r.
barciu and Rattus sp. Scattered single collections
occur supposedly from other species of Rattus, never
more than a single specimen to a collection, and
never from more than one or two of the total in-
dividuals of a particular species collected. Such
collections were undoubtedly due to mechanical
contamination during the collecting process.

For many years confusion has existed as to the
identity of H. pacifica. The original description con-
tains nothing that would serve to distinguish this
species from H. occidentalis. Until recently H.
occula (occidentalis) was the only known species,
but small points of difference between true H. occidentalis and H. pacifica simply could not be adequately investigated. As well, Feris had before him at the time he described H. occidentalis fewer than three
other species: H. trzeci Johnson from African Crassodon and H. aldabi from Asia; H. hystiorhodops Duszylnce; and H. pacifica from Philippine Rattus.

The amount of difference between H. occidentalis
and H. pacifica is very small, so that the amount of difference found between true H.
occula (occidentalis) and Feris' specimens of H.

pacific
from Philippine rats. Therefore it is not surprising that in 1932 Ferris felt justified in synonymizing H. pacifica under H. cunucui on a morphological basis. H. pacifica, however, has a laterally directed cuneus margin of the last maxilla which is distinct from H. cunucui. The relationships of H. pacifica to other H. cunucui species are as follows: H. cunucui is the type species of the genus, and H. pacifica is considered a junior synonym of H. cunucui.

North American authors, beginning with Pritchard in 1947, have accepted Ferris' views of the synonymy of H. cunucui and H. pacifica, with the result that the Hoplopleura of Rattus in the Southeastern States is always referred to as H. cunucui, not H. pacifica.

Furthermore, further specimens of H. cunucui from the type host (Otomys hypogaea) published in 1905 in the Proceedings of the Colorado and Arizona Academy of Sciences. Ferris have found the presence of H. cunucui under the names O. hypogaea, O. hypogaea from the Panamanian Islands, and O. hypogaea from the Philippine Islands. However, no specimens of H. cunucui have been found in the Western Hemisphere, and it is possible that the specimens reported from this area are H. cunucui, not H. pacifica.

A study of the type series of H. cunucui and H. pacifica suggests that the species are conspecific and that H. pacifica is a junior synonym of H. cunucui. Morphological differences between the type specimens of H. cunucui and H. pacifica are slight, and it is possible that the differences are due to individual variation rather than specific differences.

H. pacifica is a species of the Hoplopleura group of the genus Hystrix. It is closest morphologically to H. cunucui. Like H. cunucui, H. pacifica has a lateral abdominal seta, but the abdominal setae are much longer and the last maxilla has a distinct cuneus margin. H. pacifica is distinguished from H. cunucui by its larger size and the more pronounced lateral abdominal setae.

The type series of H. pacifica consists of a single specimen collected on May 13, 1953, in the Philippines. This specimen has a distinct lateral abdominal seta and a laterally directed cuneus margin of the last maxilla, characteristics that are typical of H. cunucui. The differences between H. cunucui and H. pacifica are slight and not all are constant. H. pacifica has the dorsal apical angle of the paragastral plate VI rugose and somewhat more deeply excavated than in H. cunucui. However, the dorsal apical angle of the paragastral plate VI is more deeply excavated in H. cunucui than in H. pacifica. The ventral apical angle of the paragastral plate VI is more deeply excavated in H. cunucui than in H. pacifica.

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female. Usually with one lateral set of tergal plates on segment 6 on each side, occasionally lacking these setae; ventrally one or more of segments 4-7 may also lack setae. Tergal setae also on plates. 

**Hoplolaccus cinereus** (Cunnings)  
Holotype female, holotype male, paratypes. 

**Hoplolaccus crassicaudatus** (Cunnings)  
Holotype female, paratypes. 

**Hoplolaccus fischeri**  
Holotype female, paratypes. 

**Hoplolaccus glaber**  
Holotype male, paratypes. 

**Hoplolaccus hirundinariae**  
Holotype male, paratypes. 

**Hoplolaccus latipes**  
Holotype male, paratypes. 

**Hoplolaccus longicollis**  
Holotype female, paratypes. 

**Hoplolaccus lunatus**  
Holotype female, paratypes. 

**Hoplolaccus modestus**  
Holotype male, paratypes. 

**Hoplolaccus murinus**  
Holotype female, paratypes. 

**Hoplolaccus multisetulosus**  
Holotype female, paratypes. 

**Hoplolaccus nigritus**  
Holotype female, paratypes. 

**Hoplolaccus notatus**  
Holotype female, paratypes. 

**Hoplolaccus oblongus**  
Holotype female, paratypes. 

**Hoplolaccus pallescens**  
Holotype female, paratypes. 

**Hoplolaccus paranensis**  
Holotype female, paratypes. 

**Hoplolaccus punctatus**  
Holotype female, paratypes. 

**Hoplolaccus rodriguezi**  
Holotype female, paratypes. 

**Hoplolaccus similis**  
Holotype female, paratypes. 

**Hoplolaccus tenuis**  
Holotype female, paratypes. 

**Hoplolaccus ventralis**  
Holotype female, paratypes. 

**Hoplolaccus viridis**  
Holotype female, paratypes. 

**Hoplolaccus wrightii**  
Holotype female, paratypes. 

**Hoplolaccus yucatanicus**  
Holotype female, paratypes. 

**Hoplolaccus zonatus**  
Holotype female, paratypes. 

**Hoplolaccus zonatus**  
Holotype female, paratypes.
of setae: a small slender plate associated with anterior row of each segment. Paratergal plates as in female. (fig. 31). Typical of Hepholopha,
not diagnostic.

LEGS.—Female holotype: 18 mm; paratypes: 16.1-19.5 mm. Male allotype: 1.85 mm; paratypes: 2.14-2.54 mm.

Although H. diaphora is highly modified, its basic relationships are with the genus Hepholopha. Typical of Hepholopha is the head settation: the two long, well-developed dorsal setae on the third antennal segment of the male: the presence of a small triangular sclerite between the ocelli on the third pair of legs; the divided condition of paratergal plate II: the pair of posteromarginal setae found on either side on the first two tergal plates of the abdomen, with the central part of the respective plate margin lacking setae; the form of the aedeagus; and the number of rows of setae per segment on the abdomen in both sexes. H. diaphora departs from the typical condition in having both most of its abdominal plates, in having only one set of each on paratergal plates IV-VI; in having the third pair of legs normal, not com- pressed; in lacking paired enlarged setae on the sternal plate of segment 3, and in not having this plate extending to paratergal plates III; and in reduction of paratergal plates VIII/IX. As well, the cuticle is flecked in appearance and the sclerotization of the legs, thorax is much heavier than usual in H. diaphora, suggesting the normal condi- tion of the family Linnaeidae.

Many of the departures from the norm exhibited by H. diaphora are paralleled in degree by other Hepholopha species. For example, H. diaphora II. Ferris and H. enigmatici Ferris do not have the large eyes, and in the paratergal plates, in the paratergal plates, H. agnusceptri Ferris has no apical setae on paratergal plates IV-VI, and H. cribrarum has accessory plates only on segments 2-3 in similar H. enigmatici. In H. diaphora, H. diagyna, H. malayana, and H. digyna, except in H. malayana the plate of segment 3 extends to the paratergal plates and there are paired slightly enlarged setae present. Although the length of the appendages, in all these species, are its closest relative among the Indo-Malayan Hepholopha in H. malayana. The hosts of H. malayana appear to be very different (L. bienetii and R. boiei respectively) are isolated forms of P. agasta. According to D. H. Johnson, R. bienetii is superficially similar to R. bienetii and the other R. bienetii species of the Indo-Malayan region.

**Chantarastrus Waterston, 1939, 1939:** 1939. Ferris 1932, 298; Ferris 1938, 1939.

**Type or Gen.** —Chantarastrus croceola Waterston, by monotypy.

**Description.** —Antennae four-segmented, sensillae of usual fourth and fifth segments coalesced into one. Antennae less slender, with shorter club, middle legs similar but larger, hind legs shorter, heavily sclerized and compressed, tarsus claw flattened. Thoracic sternal plate present. Spermatheca on segments 3-4. Paratergal plates 3-8, those of segment 2 divided into dorsal small and larger sclerite bearing part (the dorsal part may be the paratergal plate of segments plates posterior to appear to be divided longitudinally into two parts. Sternal plate of abdominal segment 2 divided into two parts, other sternal and tergal plates well developed, with each plates dorsally and ventrally on segments 3-6; male with one plate on each segment, the plate on segments 4-6 with two rows of setae, suggesting fusion of two plates on each of these segments: tergal plate of segment 6 with hyposternal angulus produced into free proc- ess which is bent appressed to midline of body.

This genus now contains two species, including one described in this paper. Both species infix ground shores of the subfamily Chortodinae. This genus is apparently most closely related to Schizorinae and Hactinamorphinae from India.

**Anistroplax nesia, new species.**

**TYPE DATA.** —Female holotype and one female paratype from "ground shrew," New Borneo: Tem Marl, Paganum, Ulu Kajang, 21 July 1953, (E. M. Swed.)

**Label Data.** —From "ground shrew," Bellamy: Pahang, Mt. Bhum- tung, 5000 feet, 10 January 1938, R. H. Ferris 4276; D. H. Johnson informs us that the host of this ho- tyne is probably either Suncus sp. or Crocuta sp. Unfortunately, further host data are not obtained at this time, but the discovery of a second species of this highly modified genus is of sufficient interest to warrant the description of the new form.

**Description.** —Separate from the only other de- scribed member of the genus (A. crocea Waterston, from Crocuta hemerodirum, Ceylon) in that para- tergal plates III and V are distinctly marked, the other tergal plates usually smaller and thinner than in A. crocea. Paratergal plates of the abdomen are more or less equally large, and the setae are mostly larger and thinner than in A. crocea. The antennae are four-segmented, with the second and fourth segments almost entirely coalesced (actual segments involved not involved). Anterior tergite of segment 3 is much larger than the others.

**Anistroplax croceola Waterston, by monotypy.**

**DESCRIPTION.** —Female (fig. 17): Head (fig. 36, dorsum). Anterior to antennae narrowed into a conical projection which is as long as broad. Antennae four-segmented, with the third and fourth segments almost entirely coalesced (actual segments involved not involved). Anterior tergite of segment 3 is much larger than the others.

**Anistroplax croceola Waterston, by monotypy.**

**DESCRIPTION.** —Female (fig. 37): Head (fig. 38, dorson). Anterior to antennae narrowed into a conical projection which is as long as broad. Antennae four-segmented, with the third and fourth segments almost entirely coalesced (actual segments involved not involved). Anterior tergite of segment 3 is much larger than the others.

**Anistroplax croceola Waterston, by monotypy.**

(11) Plates associated with all ventral abdominal rows of setae.

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(11) Plates associated with all ventral abdominal rows of setae.
The Boarmian specimens from Dremmysca pora are
a question. According to D. H. Johnson the type
host of X. cognatus, Mentex bedordieri, is found only
in Thailand. However, without this border, and Mentex
is probably a monotypic genus. Species of Drem-
mysca, on the other hand, are found in Thailand.
Mentex bedordieri seems to be almost the same two
species. In each case, the spine of Malayan specimens
is large, that of Boarmian specimens small.

A different type of variation occurs between speci-
mens of Dremmysca pora and those from Malay.
Glyptotaenia. In this case the spine on the basal
antenal segment of Glyptotaenia specimens (fig.
43E) is larger than that of Boarmian Collembolus
species, but distinctly smaller than the spine in
Malay specimens. Further, specimens from Drem-
mysca pora are smaller than ordinary N. cognatus (5
1.6-1.8 mm, from Glyptotaenia; 9.2-2.1 mm, from Malay
and Boarmian Collembolus). An extensive study
of the species of Xenacanthomatus from (col-
lembolus and Glyptotaenia from different areas
might shed light on the phenomenon of variation
in the Apomys. To date the study of intraspecific
variation within the Apomys, based on host or
geographical differences, has been confined to
study of variation in Pedias (kainkai) and ovirro-
tral conclusions have been drawn by the various in-
guist.s.

X. cognatus may be distinguished from other
Island-Malayan Xenacanthomatus, except X. cognatus
and X. cf. bedordieri, by having a posteriorly
strongly expanded posterior to antennal
basal antennal segment with ventral, flattened tubercle:
ventral on each of segments 4-6, and with only
one sternal plate on segments 4-6, although
two rows of setae are present on each of
these plates, each with each plate but
rents of setae on basal segments 4-7 dor-
sally and 3-6 ventrally. It differs from the closely
related X. cognatus in having an enlarged spinule
seta on the postero-distal angle of the basal an-
tenal segment, which is usually prolonged.
Like most other species of Xenacanthomatus, the
tarsal claw of the first leg is apically bifurcate.

The variation demonstrated in size of the postero-
distal spine on the basal antennal segment of X.
cognatus is of considerable interest. Specimens
from Formosa, Thai, and Malayan Collembolus species
are all much developed and the postero-
distal bearing it somewhat elongated (fig. 43A,
X. cognatus and C. spec. Specimens from Boarmian
Collembolus have a spine much smaller and the postero-distal prolongation slight or absent
(fig. 43B and D). The size difference is not de-
pendent upon the species of Collembolus involved,
and argues against the existence of an isolated
host for one of the two described species on Boarmian Collembolus. The variation appears
to be geographical in type. Figure 43.11 shows the difference in the Malayan C.
notatus and C. spec. spec. as opposed to Boarmian C. notatus and C. spec. spec., with the same two species. In each case, the spine of Malayan specimens is large, that of Boarmian specimens small.

X. cognatus was described from the male holotype and female allotype from Hydropotes inermis, North Borneo, 21st April, 1985. This species is distinguished from X. cognatus by having both the postcerebral and occi-
cipital angles of the head strongly marked, and with the postcerebral portion of the clypeus
slightly produced. It may be distinguished from X. cognatus in that the anal segments 2 and 3 do not bear a stout, sharp seta postero-distally, and the short, short, dorsal seta on the basal antennal segment is set more to the base of the spine than to the apex. The two species differ also in the female genitalia, see fig.
43E (X. cognatus), and 43F (X. cognatus) from
Johnson, 1957, fig. 83.(X. cognatus). It is easily separated from X. cognatus in that the
head is less longitudinally elongate than X. cognatus. The two species also differ in the form that the
boss is longer and less than in X. cognatus. The
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boss is longer and less than in X. cognatus. The
Neochactomatus robustus, new species

(Figs. 47, 48, 50, 56, 57, 66)

**Type Data.**—Male holotype, female allotype, one male, and two female paratypes from *Peleuria dolosus* pullata, Malay: Pulau, Sibuyan, etc., 3, 500 feet, 26 Sept. 1935, RTE 26729. One male and two female paratypes with data as above except: 1, 500 feet, 11 Jan. 1938, RTE B-7493.

**Description.**—*N. robustus* is an inhabitant of the group of *Neochactomatus* species which infect *Asian giant flying squirrels* of the genus *Peleuria*. It may be separated from *N. ferris* by a combination of the following characters: the abdomen of the type specimen is not strongly reduced; the body is slender, the thoracic sternal plate is obviously longer than broad (compare figs. 47 and 50); the female the lateral margins of the parameres are markedly convex and the pseudopenis extends well beyond the tips of the parameres (fig. 56). As well, there are fewer lateral setae on the tegumen and sternal plates of the abdomen, especially in male *N. robustus* which does not have the third to fifth setae on each side opposite each tegmental or sternal plate. *N. robustus* is distinct from *N. belahouane* and *N. pallidus* in having the tegumen and sternal plates of the abdomen normal and the typically shaped thoracic sternum plate (compare figs. 57 and 64). It further differs from *batunthus* in having larger parategumental plates bearing a prismatic seta as well as the plate bearing them (compare figs. 57 and 64).

**Description.**—(Fig. 48).—*Head.* Longer than broad, anteriorly flattened, lateral mandibular margins parallel, posterior mandibular margins oblique, anterior anal margins of the abdomen normal, and of the tegumen and sternal plates of the abdomen not much reduced and at times incomplete, and the cuticular covering not ridged or corrugated. **Type Data.**—Male holotype, female allotype, one male, and one female paratype from *Peleuria dolosus* pullata, Malay: Pulau, Sibuyan, etc., 3, 500 feet, 26 Sept. 1935, RTE 26729. Two males, three female paratypes from *Peleuria dolosus* pullata, Malay: Sibuyan, Pulau, Sibuyan, etc., 14 Dec. 1950, RTE 28-2822. (These specimens were reported as *N. belahouane* by Ferris in 1950). Two male, three female paratypes from *Peleuria dolosus* pullata, Malay: Sibuyan, Pulau, Sibuyan, etc., 14 Dec. 1950, RTE 28-2822.

**Description.**—(Fig. 51).—Head, Thorax, and Legs. As in male except third antennal segment unmodified. Abdomen. Tergum and sternal plates narrow but not strongly reduced, one to three setae present laterally off each side of most plates, both dorsi- and ventrally. Parategumental plates (fig. 57) as in male, trans- lated not distinct. **Length.**—Male holotype: 1.85 mm.; paratypes: 1.74-1.9 mm. Female allotype: 2.45 mm.; paratypes: 2.31-2.4 mm.

**Neochactomatus palidus**new species

(Figs. 49, 52, 53, 55, 60, 62, 65)

*Neochactomatus palidus* (Johnson, 1929, 294, err.)

**Type Data.**—Male holotype, female allotype, one male, and one female paratypes from *Peleuria dolosus* pullata, Malay: Pulau, Sibuyan, etc., 3, 500 feet, 26 Sept. 1935, RTE 26729. Two males, three female paratypes from *Peleuria dolosus* pullata, Malay: Sibuyan, Pulau, Sibuyan, etc., 14 Dec. 1950, RTE 28-2822.

**Description.**—(Fig. 48).—*Head.* Longer than broad, anteriorly flattened, lateral mandibular margins parallel, posterior mandibular margins oblique, anal margins of the abdomen normal, and of the tegumen and sternal plates of the abdomen not much reduced and at times incomplete, and the cuticular covering not ridged or corrugated. **Type Data.**—Male holotype, female allotype, one male, and one female paratypes from *Peleuria dolosus* pullata, Malay: Pulau, Sibuyan, etc., 3, 500 feet, 26 Sept. 1935, RTE 26729. Two males, three female paratypes from *Peleuria dolosus* pullata, Malay: Sibuyan, Pulau, Sibuyan, etc., 14 Dec. 1950, RTE 28-2822.
types, all from Yapnli, Malaya, as follows: one male, one female, and one holotype each except R. 47285. One female, Selangor, Finkid Loping Forest Reserve, 22 Feb, 1958, RT 41270. Eight males, eight females, Frank McCullow Hill,控股集团. 4900 ft, 20 Mar, 1958, RT 41278.

Description.—Male (fig. 68). Head. Longer than broad, narrowing anteriorly. Antennal and palpal segments narrowly annulate, broad, heavily setose. Postocular and occipital angles marked; postocellars heavily setose, stridulatory, situated posteriorly. Gular region of head center (fig. 71) covered with pointed tubercles; basal and second antennal segments tubercles, ventral center of base segment also with one squared flabellate hobe on procercus anterior part; third antennal segment with dactyl margin serrate in appearance ventrally, not especially prolonged antecostally, the two expanded spinellar setae close together, set on small protuberance of the dorsal surface (fig. 69). Thorax. Broader than head; prominent longitudinal sclerotizations dorsolaterally; thoracic sternal plate (fig. 72, d) somewhat longer than broad, posterior apical angles slightly produced. Legs. First pair with specialized elongate broad setae subapically and laterally on thrombopous edge of tibia which opposed tarsal claw (fig. 70, a) (a tendency toward the same modification occurring in certain species of Neocyboroponini). Abdomen. Radial setae of second plate on tergum 2 arranged in groups of three or four pairs of tubercles, with two to four heavy, straight setae in each of two rows; these rows very close together; ventrally rows on segments 3-4 with four or five slightly thinner setae; laterally one small seta on each side of segments 3-4 near corresponding paratergal plates. Paratergal plates II (fig. 74, a) wrapped around lateral margin of body, bearing one long and one short apical setae; plates HI-VI similar to one another in shape, diminishing in size from anterior to posterior, posterior margins of plate concave between setal bases, apical points rounded, pairs of apical setae all as long as plate bearing them; plates VII-VIII lacking posterior apical setae, apical setae long; plate V-X with three apical setae, the third being captured from the dorsal integument (a similar modification is common in Neocyboroponini). Thorax. (fig. 76) wings long, thin and broad; palpi, slightly convex, thin; pseudopods broad; basally, lacking sete lateral margins, arrow-shaped apex excised to form a spine. Male. (fig. 67). Head (fig. 72). As in male except third antennal segment not modified. The holotype has the antennae abnormal on one side, with only four segments; Thorax and Leg. As in male. Abdomen. Much smaller than male except no radial setae on tergum 2, rows of tarsi with highly variable number of tarsal setae; third tarsal row with five to five setae each. One paratype female is abnormal, having a shorter apical setae on paratergal plates HI on one side. Genitalia (fig. 77). With lateral sigillarate lobes of segment 8 incorporated into genital plate, bearing four or five medium-sized setae on tergum 2; one or two rows of setae 2-3, one on remaining sterna. Ventral plates of abdominal segments 2-3 never produced laterally to appear as appendages to the paratergal plates of these segments.

There are about 46 valid described species of Polyplyax. The distribution of this group is worldwide, usually on mangroves, although one species occurs on shrews and another on a South American tree. All subsequently listed are known to occur in the Indo-Malayan region. One of these species is described in this paper as new. Two of these are treated in the present distribution: P. splanulosa and P. rectilinear.


This cosmopolitan species has as its normal hosts Rattus rattus and Rattus norvegicus. Johnston (1909) found it to be a relatively rare species on Rattus rattus in Thailand; but from the above species plus P. splanulosa and P. tarsomys in having both apical setae on paratergal plates IV-VI about as long or longer than the plate bearing them.

Polyplyax tarsomys (Exley) 1869. 9. Female polyplyax tarsomys Exley 1869, 47; figs. 197, 198. Male polyplyax tarsomys: Ferris 1932, 187; figs. 190, 193, 194, 195. F. and H. Johnston 1906, 529, fig. 23.

The holotype male was taken from the skin of a Varmainsia species (Rattus rattus) inJava. The type species of the genus is Polyplyax rectilinear (Burmister) 1869. 9. Male polyplyax rectilinear: Exley 1869, 47; figs. 197, 198. Ferris 1932, 187; figs. 190, 193, 194, 195. F. and H. Johnston 1906, 529, fig. 23.

The 46 species of Polyplyax fall into four groups: (1) those that are found onshore; (2) those that are found offshore; (3) those that are found on mangroves; and (4) those that are found on trees. The following is a list of the species and a discussion of the morphological variation within the species.

During the present year two females were collected from a Sanuri nectarine taken at Kuta Laut, Selangor, Malaya (RT 41274). Like most Southeast Asian species of P. rectilinaria, these females have very large spindles. P. rectilinaria may be separated from P. splanulosa by the following characters: P. splanulosa and P. tarsomys in having both apical setae on paratergal plates IV-VI about as long or longer than the plate bearing them.
Polypax bullulense Johnson

Polypax bullulense Johnson 1958, 76, figs. 5, 6, 8, 9.

This name was based on the male holotype, female allotype, and four male and two female paratypes from Bululun bayaug, east slope of Mt. Mc-

Kady, Mindanao, Philippines. Chicago Natural History Museum (no. 5630) (holotype and three male paratypes), and C.N.I.M. (mammal no. 56280) (allotype, and one male and two female paratypes).

This species is immediately separated from P. reicornis, P. spinulosa, and P. tarsosa by having the abdominal plates normal and not at all reduced.

Description—Male (fig. 77): Head. Less than one and one-half times as long as broad; somewhat flattened anteriorly, with rounded angles; posteroventral head margins converging slightly toward occiput. Gular region not raised. Basal antennal segments not especially reduced. Third antennal segment with short antero-

vagal prolongations dorsal, bearing short dorso-

vagal segments slightly longer than in female. Third anten
cal segment with short antero-

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PLATE 1. *Hoplodrimeres* species

Fig. 1, 3–11. *parvus* from *Kronus nactus* sp. n. Fig. 1–Thoracic sternal plates: a, Malaya; b, Thailand (K. crinul); c, Thailand; d, Laos; e, Madagascar; f, Formosa; g and h, Borneo; i and j, Malaya. Fig. 5–Aegyptus (Malaya).

Figs. 2, 6–11. *aurouros* from *Kronus*. Fig. 2–Thoracic sternal plates: a and b, Congo; c, paratype female; d, Gabon. Fig. 6–Aegyptus, paratype.

Figs. 3–5. *sternum*, thoracic sternal plate, female paratype (B-Silo).

Fig. 4. *aurous*, thoracic sternal plate, female holotype.

PLATE 2. *Hoplodrimeres* species

Figs. 7, 8–11. *aurouros*. Fig. 7–Head: a, paratype female; b and c, Congo; d, Uganda. Fig. 8–Postanterior angles, paratype, Congo, Uganda.

Figs. 9, 10–11. *parvus* from *Kronus nactus* sp. n. Fig. 9–Postanterior angles, Formosa, Malaya, Thailand, Formosa, Madagascar. Fig. 10–Head: a, Borneo; b, Formosa; c, Madagascar; d, Thailand (K. crinul).
Plate 3. *Hoplolpluma* species

Figs. 11, 12, 15, 16. *parvula* from *R. rattus*, Malaya. Figs. 12, 13. Paratopical plates III-VIII, female. Fig. 15—Head, female.

Figs. 12, 13. *parvula* female paratype, paratopical plates III-VIII.

Figs. 12, 13. *parvula* female paratype (RT 8-1069). Figs. 12, 13. Paratopical plates III-VIII. Fig. 15—Head, female.

Figs. 16, 17. *lochmiana* female paratype (R 8626). Figs. 16, 17. Paratopical plates III-VIII. Fig. 17—Head.

Plate 4. *Hoplolpluma denticula*

Fig. 18. Female paratype (RT 8-8606). Figs. 19, 20, 21. Adenous, two male paratypes (R 45284).
Plate 5. *Hoplitesma siatoa*

Fig. 22.—Female holotype. Fig. 23.—Male allotype. Fig. 24.—Sedative, paratype (KT B-I90109).

Plate 6. *H. plegiopuncata* n.sp., from *Rattus sabanus*, Malaya

Fig. 25.—Female. Fig. 26.—Male. Fig. 27.—Anceps. Fig. 28.—Thoracic sternal plate, female.
PLATE 7. Haplopleura diaphana, female holotype, male allotype.

Fig. 29.—Female. Fig. 30.—Male. Fig. 31.—Andragus. Fig. 32.—Thoracic sternal plate, female.

PLATE 8. Haplopleura species

Figs. 33, 34.—H. diaphana, female holotype. Fig. 35.—Paratergal plates. Fig. 36.—Genital segments.
Figs. 37, 38.—H. subterranea Ferris from R. johnsoni, Malaysia. Fig. 37.—Paratergal plates III-VI, female. Fig. 38.—Paratergal plates III-VI, male.
PLATE LI. Xenothrombotaenia species.

Figs. 52, 53, 55.-N. patholax. Fig. 52.-Female allotype. Fig. 53.-Male holotype. Fig. 55.-Anterior, holotype.

Figs. 54.-N. tenacior.-Anterior, allotype (pseudopods broken off).

Figs. 56.-N. mera.-Anterior, holotype.

PLATE LI. Xenothrombotaenia species.

Figs. 57, 58.-N. robusta, female allotype. Fig. 57.-Paratenoal plates II-V. Fig. 58.-Thoracic sternal plate.

Figs. 59, 60.-N. tetrapodia, female paratype (from U.S.N.M. mammal No. 175471). Fig. 59.-Paratenoal plates II-V. Fig. 60.-Thoracic sternal plate.

Figs. 61, 62.-N. patholax, male holotype, female allotype. Fig. 61.-Paratenoal plates II-V. Fig. 62.-Thoracic sternal plate, male.

Figs. 63, 64.-N. mera, male allotype. Fig. 63.-Paratenoal plates II-V. Fig. 64.-Thoracic sternal plate.
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