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The Identity of Megachile rotundata (Fabricius) and M. argentata (Fabricius) (Hymenoptera: Apoidea).

By
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For more than 150 years the identity of *Megachile rotundata* and *M. argentata* have quite apparently been based chiefly, if not entirely, on interpretations of the original descriptions supplied by Fabricius (1787, 1793). It also appears that even though Fabricius provided remarkably informative type locality statements, the import of these were either overlooked or not considered seriously. Only Mitchell (1962:122-124) has questioned the identity of one of these species (*M. rotundata*). Unfortunately, as the type studies reported herein reveal, these names have become associated with species of *Megachile* other than those described by Fabricius. This is particularly unfortunate since a large literature, both economic and systematic, is tied to these names. Equally disturbing is the realization that neither of the Fabrician names are, as has been supposed (Mitchell, 1937; Krombein, 1948; Daly, 1952; Hurd, 1954; and Stephen and Torchio, 1961), the correct names for two of the accidentally introduced species of *Eutricharaea* in the United States. This state of affairs is especially troublesome because the so-called *Megachile rotundata,* which has shown much promise as a pollinator of alfalfa in the United States and Canada (Bohart, 1962; Stephen, 1962; Hobbs, 1965; and Bacon, *et al.,* 1965), is not *Megachile rotundata* (Fabricius) and is, as a consequence of this investigation, left without a name. Moreover the geographic origins are presently unknown for both of these introduced species.

The purpose of this study is to set forth in some detail the results stemming from my examination of the extant type specimens of *M. rotundata* (Fabricius) and *M. argentata* (Fabricius).

As is discussed in the accounts which follow, the first is a synonym of *Megachile* (*Megachile*) *centuncularis* (Linnaeus) in the sense of modern authors, while the second is a North African species of *Megachile* belonging to the subgenus *Eutricharaea.*

These investigations were made possible by a grant from the National Science Foundation of the United States and were greatly facilitated by Drs. S. L. Tuxen and Børge Petersen of the Zoological Museum of Copenhagen. I am also indebted to Miss Ella Zimsen of that institution for allowing me free access to her manuscript entitled, The type material of I. C. Fabricius, which was published shortly after my visit (Zimsen, 1964).

I wish to express my gratitude to Professor E. Gorton Linsley, University of California for a critically helpful review of the manuscript.

Megachile rotundata (Fabricius).

Apis rotundata Fabricius, 1787, Mant. Insect., 1:303 ("Habitat Hafniae D. Pflug."); Fabricius, 1793, Ent. Syst., 2:332-333 ("Habitat Hafniae Dr. Pflug."); Zimsen, 1964, The type material of I. C. Fabricius, p. 419 ("Copenhagen 1 specimen").

Anthidium rotundatum Fabricius, 1804, Syst. Piezatorum, p. 367 ("Habitat Hafniae Dr. Pflug.").

Although specimens labeled as this species are contained in both the Copenhagen and Kiel Collections, I have designated the single male specimen in the Copenhagen Collection as the lectoholotype. Unlike the four specimens in the Kiel Collection, which represent the genera *Megachile* and *Osmia,* the Copenhagen specimen agrees in every detail with the original description. In addition to the lowermost lectotype label affixed to the pin supporting the specimen (LECTOTYPE, *Apis rotundata* Fabricius, ♂ P. D. Hurd '64), there are two labels, the uppermost a red label with a machine-printed inscription "Type" and below it a white label which carries in ink script: "A rotundata [final "a" overwritten with "um"] D. Pflug". In the lower right corner of this latter label there is a pencilled "x" presumably put there by Ella Zimsen during her search for eligible type specimens. This specimen is the basis of the Zimsen (1964:419) statement "Copenhagen 1 specimen".

The four specimens in the Kiel Collection are males and are pinned in a transverse row behind two large labels which are secured to the bottom of the box by note pins. The first label in

ink script reads "Osmia angustata Zett" and behind it, just before the row of specimens, is a typewritten label by Ella Zimsen: "Anthidium rotundatum F. Syst. Piez. 1804, p. 367.8". From left to right the row of specimens, all males, represent the following:

(1) A specimen of the genus *Osmia,* in good condition, bears a single white label which reads: "Fabr. Saml. unter Anthid. rotundatum".

(2) A representative of the genus *Osmia* which has been rather severely eaten by museum pests such that only a shell of the head, the thorax and appendages are left. The metasoma is missing. A single white label is affixed to the pin and reads in ink script: "rotundata".

(3) An unlabeled specimen of the genus *Megachile,* subgenus *Eutricharaea.* It is in good condition, but the very pallid vestiture and reddened integument suggests that it may have been exposed to light for a protracted period of time.

(4) A specimen of the genus *Megachile,* subgenus *Eutricharaea,* which in spite of damage to the eyes and antennae by museum pests, is otherwise in good condition. The eyes have been largely eaten away and only the scape, pedicel and first flagellar segments of the antennae remain.

The lectoholotype of *Apis rotundata* is in remarkably good condition. The head was boldly glued to the thorax in such a manner as it was impossible to see the mouth-parts or even the bases of the fore legs. Fortunately the glue is readily soluble in water and a sufficient portion of the obscuring mass was dissolved away so as to expose the mandibles and fore coxae. Once visible it became immediately evident that the specimen represents the well known *Megachile (Megachile) centuncularis* (Linnaeus) in the sense of current usage.

According to the type statement provided by Fabricius (1787: 303), the original description of *Apis rotundata* is founded upon material from "Hafniae" which, as Dr. Børge Petersen points out, is the equivalent of Copenhagen. In the entomological collections of the Zoological Museum of Copenhagen I was able to locate a male of *M. centuncularis* that matches the lectoholotype of *Apis rotundata* in almost every detail. This specimen, which had been collected in Copenhagen, was loaned to me by Dr. Petersen for subsequent comparative type studies centering on *M. centuncularis,* the type species of *Megachile* (see Opinion 219, Ops. Decls. int. Comm. Zool. Nomencl. 4:95-101, 1954).

Upon my arrival in London Dr. I. H. H. Yarrow kindly made arrangements with Mr. W. H. T. Tams for Dr. Yarrow and I to visit Burlington House, Linnean Society of London, in order to examine the putative type of *Apis centuncularis* Linnaeus. Not unexpectedly our examination of that specimen reveals the same findings previously reported by Richards (1935:175). The specimen is a female of *Megachile ligniseca* (Kirby) and consequently does not agree with the current concept of *M. centuncularis*. However, as Richards (*ibid.*) concludes "... there is no reason why *Megachile centuncularis* of modern authors should not continue under this name". This is obviously not only a desirable objective but is also essential if we are to achieve a concordance in the nomenclature and taxonomy for the type species of the genus *Megachile*. To secure this basis, the selection and designation of a neotype appears necessary. If this is done then it would seem appropriate to obtain specimens of *Megachile centuncularis* (current concept) from the gardens of Linnaeus' home.

In any event, the lectoholotype of *Apis rotundata* Fabricius is synonymous with *Megachile* (*Megachile*) *centuncularis* (current concept) and is not, as has generally been supposed, a representative of *Megachile,* subgenus *Eutricharaea*. The correct name for "*Megachile* (*Eutricharea*) *rotundata* (Fabricius)" remains to be established. It is indeed a regrettable state of affairs since this species, which has masqueraded under the name of "*Megachile rotundata* (Fabricius)", is economically important to agriculture and has been both accidentally and purposely introduced into the New World.

Megachile argentata (Fabricius).

Apis argentata Fabricius, 1793, Ent. Syst., 2:336 ("Habitat in Barbaria Mus. Dom. Desfontaines."); Zimsen, 1964, The type material of I. C. Fabricius, p. 421 ("Kiel 4 specimens").

Anthophora argentata, Fabricius, 1804, Syst. Piezatorum, p. 377 ("Habitat in Barbaria, Gallia Dom. Desfontaines.").

This species was described by Fabricius (1793:336) on the evidence of his type statement from material collected in "Barbaria" by René Louriche Desfontaines. According to Zimsen (1964: 17), Desfontaines traveled in Tunisia and Algeria around 1790 where he collected, in addition to plants, insect specimens which served as the basis for some 100 of the species described by Fabricius. Zimsen (*ibid.*) mentions that Walter Horn states that the

Desfontaines collection was deposited in the museum in Paris, but the staff there were unable to supply her with any information as to its whereabouts. However, the personal collection of Fabricius (Kiel Collection) contains 4 specimens of *Apis argentata* Fabricius (Zimsen, 1964:421). These specimens, three of which are pinned in a transverse row with the fourth specimen pinned behind the second, are preceded by two large labels that are secured to the bottom of the box by note pins. The first label in ink script reads "Megachile argentata F" and behind it, just before the specimens, is a typewritten label: "Anthophora argentata F. Syst. Piez. 1804, p.p. [sic!] 377.2". From left to right the first row of specimens represent the following:

(1) An unlabeled male of the genus *Megachile,* subgenus *Eutricharaea* in poor condition. The head and all the legs, except right hind one, are missing.

(2) A female of the genus *Megachile,* subgenus *Eutricharaea* with some museum pest damage, as noted below, to the antennae and legs. It is impaled on a pin some 22 mm in length. The scape and pedicel of both antennae are present, but all of the flagellar segments are missing except the basal one of the right antenna and the basal two of the left antenna. All legs except the right fore leg are reduced to coxal stumps or shells but some fragments of the left front femur and its tibia remain. The wings are intact and are partly spread in a drooping attitude. Two labels are affixed to the pin, the uppermost a red label with a machine-printed inscription "Type" and below it a white label which carries in ink script: "argentata". As discussed below this specimen is selected to serve as the lectoholotype and thus a third label (LECTOTYPE, *Apis argentata* Fabricius, ♀ P. D. Hurd '64) is affixed as the lowermost label on the pin.

(3) An unlabeled female of the genus *Megachile,* subgenus *Eutricharaea* in poor condition. The head is missing and the legs have been partly eaten by museum pests.

The fourth specimen in this group is, as noted above, pinned behind the second specimen of the transverse row of three specimens and is:

(4) A male of the genus *Melitta* with the head eaten away most noticeably on the left side. There are two labels consisting of white paper, the upper in ink script which reads: "Fab Samml

unter Anthophora argentata" and the lower label in ink handprinting: "Cilissa melanura Nyl.".

The second specimen (2) is selected and designated to serve as the lectoholotype. It is selected not only because of its better state of preservation but more importantly the species it represents has been subsequently collected from the type locality. Of the specimens known to me from "Barbaria", the one that agrees in virtually every detail with the lectoholotype is a female in the collection of the British Museum (Natural History) and is labeled from Algeria (Frederick Smith Collection, presented by Mrs. Farren White, 99-303). As discussed earlier, since Desfontaines collected the material upon which Fabricius based the original description of *Megachile argentata,* and since the collections of Desfontaines in North Africa were made in Algeria and Tunisia, the type locality "Barbaria" is by these facts restricted to either Algeria or Tunisia. On the evidence of subsequently collected material of this species in North Africa it appears almost a certainty that the type locality is in Algeria. Even so I hesitate to so restrict the type locality until such time that more adequate samples become available from this area of North Africa.

In any event it is certain that the so-called *Megachile argentata* of northern and central Europe is not the same species described by Fabricius. Of course this is unfortunate in itself, but is further irksome because Thomson (1872:228) has based the subgenus *Eutricharaea* clearly and unambiguously upon the so-called *Megachile argentata* of Scandinavia. He has thus based *Eutricharaea* on a misidentified type species. This is, perhaps, a trivial matter since the so-called *Megachile argentata* properly belongs to the subgenus *Eutricharaea.* Obviously a critical revision is indicated for the *M. argentata* complex of northern and central Europe. *Megachile* (*Eutricharaea*) *leachella* Curtis (1828:219) is an available name and appears to be the senior name for the northern and central European *M. argentata* of authors. *Apis albiventris* Panzer (1798) is not, as his illustration reveals, a species of the genus *Megachile* or for that matter a member of the family Megachilidae.

The following descriptive comments are based on the lectoholotype female of *Apis argentata* Fabricius and are offered to facilitate its identification. The measurements, which follow, were taken in accordance with the methods outlined by Hurd and Moure (1963:41-43).

Length of body 10 mm. Forewing including tegula, ± 7.0 mm. Maximum width of abdomen, as seen from above, 3.4 mm.

Eye, 71:60:55:51; clypeus, 27 x — : — : 42; inter-ocellar, 19:15: 12:11, ♀ 7; malar area, 0 × 14; interalveolar, 19:15:25:29, ♀ 6; antennae, 29:5:6:6: — : —, ♀ —.

Vestiture chiefly white or silvery, that on sixth metasomal tergum consisting of two large lateral patches of appressed whitish hairs which are narrowly separated medially and are bordered anteriorly and posteriorly by pallid, almost whitish brown pubescence. Apices of metasomal sterna II-V each with a narrow intensely white band of decumbent and posteriorly projecting pubescence which strongly contrasts with the long, yellowish-white, over projecting scopal hairs; scopal hairs on first metasomal sternum white, disposed laterally; tegulua reddish-brown, scarcely darker than wing nervures; apex of first metasomal sternum, although partly eaten away, evidently broadly and semicircularly emarginate; ocelli small, individually scarcely as large as an antennal socket.

Although the male specimen (1, above) is a *Eutricharaea* and perhaps may have been collected by Desfontaines with the lectoholotype female, I hesitate to designate it at this time as the allolectotype. Preferably this might be best reconsidered when and if the type locality is more precisely fixed.

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Entomologiske Meddelelser 35 (1967)

Noona Dan Papers No. 40.

The burrower bugs collected by the Noona Dan Expedition mainly in the Philippines and Bismarck Islands (Hemiptera: Cydnidae).

By
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Through the kind cooperation of Dr. Børge Petersen of the Zoological Museum, Copenhagen, Denmark, the 270 Cydnidae collected by the Danish Noona Dan Expedition in the Philippines (1961) and the Bismarck Islands (1962) (Petersen, 1966, Ent. Meddr. 34:283-304) were forwarded to me for study. Confident placement of some of the species was possible only because NSF Grant G 7118 enabled the author to study types in certain European museums in 1959.

The four genera and ten species (four new to science) of Cydnidae taken included three common and widespread species of the Pacific area which range onto one or more of the continents of the Old World: *Aethus indicus* (Westwood), *Geotomus pygmaeus* (Dallas) and *Macroscytus transversus* (Burmeister). The other species appear from available distribution records to have very limited ranges. This total of genera and species represents about half of those described from the general regions visited by the expedition.

All specimens of the type series for the species described here, except for a few paratypes noted as deposited elsewhere, belong to the Zoological Museum, Copenhagen. Measurements are given in millimeters.

Aethus Dallas, 1851 List Hemip. Brit. Mus., 1:112.

The exact limits of this genus are still not clear to me, but because the following species is the type of *Aethus* I do not hesitate to use this combination.

Aethus indicus (Westwood).

Cydnus indicus Westwood, 1837 in Hope, Cat. Hemip., 1:19
Aethus indicus; Dallas, 1851 List Hemip. Brit. Mus., 1:114

Although this is a very common and widely ranging species of the Old World, it was represented by surprisingly few specimens —only ten. The range of *indicus* given in literature is quite unreliable as examination of many identified specimens makes it clear that several species have been confused under the name. However, I have seen specimens from the continents bordering the Indian Ocean and from several of the islands in that body of water; in addition from numerous islands in the Pacific Ocean from the Philippine Islands south and southeast.

Solomon Islands. — GUADALCANAL: Honiara, July 27-August 4, 2 ex.

Philippine Islands. — TAWI TAWI: Lapid Lapid, November 21, 7 ex., mercury lights; Tarawakan, November 14, 1 ex.

Chilocoris Mayr, 1864 Verh. Zool. Bot. Gesell. Wien, 14:907.

In this collection of *Chilocoris,* as in most others including members of this genus, there were very few specimens of each species. This problem of limited series has made it difficult to evaluate the significance of the many small differences noted between collections from separate localities. Nevertheless, identifications, at least tentative ones, must be made.

Chilocoris entzii Horvath.

Chilocoris entzii Horvath, 1919 Ann. Mus. Nat. Hungarici, 17:260

A specimen is identified as *entzii* whose type locality was "Friedrich-Wilhelmshaven", now Madang, on the north coast of New Guinea. The original description and my notes on the type encompass this specimen very well.

Bismarck Islands. — LAVONGAI: Banatam, March 23, 1 ex.

Chilocoris incomptus, new species.

Diagnosis: Among those members of the genus with the uninterrupted transverse impression of the pronotum and virtually concolorous pronotum, scutellum and corium, this new species is recognizable by the two subapical "pegs" on the clypeus coupled with the single, subapical "peg" on each jugum.

D e s c r i p t i o n: Holotype female, brownish yellow; polished; length of body, 2.46 mm. Oval, widest across bases of hemelytra.

Head: With three primary setigerous punctures on each jugum; length nearly three-fourths width, 0.43 : 0.58, interocular width, 0.30; clypeus as long as juga, with two subapical "pegs"; juga each on basal half with three submarginal, coarse, setigerous punctures bearing fine, hair-like setae, subapically with one setigerous puncture bearing a peg; ocellus separated from eye by a space subequal to half an ocellar diameter; dorsum without further punctures. Antennal segments, I, 0.11; II, 0.66; III, 0.23; IV, 0.23; V, 0.33 [left antenna abnormal, with but 4 segments]. Bucculae almost as high as labial segment II, abruptly and convexly terminated at posterior and anterior ends. Labium reaching between middle coxae; segment II slightly compressed, without foliaceous expansion; segments I, 0.15; II, 0.38; III, 0.23; IV, 0.20.

Pronotum: Polished; length more than half width, 0.74: 1.33; anterior margin broadly emarginate; lateral margins converging from base, more convexly so on apical third; hind margin weakly convex; transverse, submedian impression with widely separated punctures and extending uninterruptedly across the disc nearly to the side margins; anterior lobe evenly convex, with a complete, subapical line, a small patch of distinct punctures subapically on midline and two setigerous punctures antero-laterally and one submarginally near posterior angle, elsewhere impunctate; posterior lobe with a submarginal setigerous puncture on each side and a transverse row of strong, distinct, widely spaced punctures across middle of disc.

Scutellum: Length less than width, 0.70: 0.80; polished, basal transverse impression and lateral submarginal grooves with distinct punctures; disc with widely scattered, somewhat foveate punctures.

Hemelytron: Polished, colored similar to but more translucent than pronotum and scutellum; clavus with a row of punctures on basal half; mesocorium with a distinctly punctate, impressed line paralleling clavo-corial suture, and with numerous well separated, small punctures on apical half; exocorium with an interrupted row of distinct punctures from base almost to apex; costa without setigerous punctures; membranal suture very indistinct due to fusion of corium with polished, coriaceous basal part of membrane; remainder of membrane hyaline, slightly yellowed, distinctly surpassing apex of abdomen.

Propleuron: Polished, impunctate except in impressions; prosternal carinae absent.

Mesopleuron: Entire surface dulled by evaporatorium.

Metapleuron: Evaporatorium covering all but peritreme and posterior lamella; peritreme a polished, grooved band extending all the way to lateral margin of sclerite and there bent posteriorly into a lobe.

Legs: Not specifically modified.

Sternites: Polished, impunctate except in basal sutures and a row of fine, setigerous punctures near apical margin of each segment.

Type data: Holotype ♀ and one paratype ♀, Philippine Islands, PALAWAN: Brooke's Point, Uring Uring, August 14, 1961, Noona Dan Expedition (Zool. Mus., Copenhagen; paratype USNM).

The species name is the Latin adjective meaning unadorned.

Chilocoris peterseni, new species.

Diagnosis: The large size (4.05-4.10), highly polished, virtually impunctate dorsal surface (including apical third of mesocorium) coupled with the absence of a transverse, postmedian impressed line on the pronotum permit ready recognition of this species within the genus.

Description: Holotype female. Polished, piceous, length of body, 4.10 mm. Form rather oval, sides nearly parallel.

Head: Length about three-fourths width, 0.69-0.91, interocular width, 0.82; with three primary setigerous punctures; anterior outline semicircular; clypeus as long as juga, with two subapical pegs; each jugum with a submarginal row of setigerous punctures, four setae at apex of row peglike but becoming finer toward eyes and then replaced by hair-like setae; dorsum of head elsewhere impunctate; ocelli distinct, separated from eye by a space subequal to ocellar diameter. Antennal segments, I 0.26; II, 0.13; III, 0.40; IV, 0.40; V, 0.53. Bucculae almost as high as labial segment II, tapering anteriorly and posteriorly from about posterior sixth. Labium reaching posterior margin of midcoxae, segment II weakly compressed, without foliaceous expansion; segments, I, 0.26; II, 0.64; III, 0.46; IV, 0.31.

Pronotum: Length more than half width, 1.43 : 2.31; anterior margin broadly concave; lateral margins entire, gently converging from base, more abruptly so in apical third; posterior margin

broadly convex; transverse discal impression absent; anterior lobe apically with a distinct, submarginal impressed line reaching from one anterior angle to the other, laterally with small, vague, longitudinal impression near margin; posterior lobe with few, very widely scattered, fine punctures.

Scutellum: Length less than basal width, 1.10 : 1.36; apex not reaching base of membrane; basal and submarginal impressed line coarsely punctured; disc polished, with very few, widely separated, small punctures.

Hemelytron: Polished; with strong punctures forming a short row on clavus, two incomplete rows on mesocorium paralleling claval suture, and one diagonal row on exocorium; exocorium also with a few fine punctures; costa without setigerous punctures; membranal suture straight; membrane hyaline, faintly amber yellow, surpassing apex of abdomen.

Propleuron: Weakly alutaceous, impunctate except behind anterior acetabula; prosternal carinae very low, rounded, not at all carinate.

Mesopleuron: Except for polished antero-lateral angle, dulled by impunctate evaporatorium.

Metapleuron: Except for polished peritreme, posterior lateral angle of supporting sclerite and posterior lamella, dulled by impunctate evaporatorium; peritreme typical of genus, extended as a narrow, polished, grooved band almost to lateral margin of segment and there with a prominent, posteriorly expanded lobe.

Sternites: Mostly polished, with fine, longitudinal rugulae laterally.

T y p e d a t a: Holotype ♀, Bismarck Islands, NEW BRITAIN: Yalom, 1000 m, May 20, 1962, Noona Dan Expedition, Malaise trap (Zool. Mus., Copenhagen). Paratype ♀, NEW GUINEA: Hudewa, Rev. L. Wagner (S. Austral. Museum).

The paratype has considerably less rugulae present on lateral part of abdomen, but otherwise appears conspecific with the holotype.

The dedication of this species is to Dr. Børge Petersen who was a member of the field party which collected these cydnids and was generously instrumental in making them available to me for study.

Chilocoris species.

One specimen is too teneral for specific placement or descrip-

tion as a novelty. It belongs among the species having the discal transverse pronotal impression complete, not interrupted medially. The anteocular part of the head is quite short, being distinctly less than the length of an eye.

Philippine Islands. — TAWI TAWI: Tarawakan, November 11, 1 ex.

Geotomus Mulsant and Rey, Ann. Soc. Linn. Lyon (n. ser.) 13:324.

Although this genus is recorded widely from the Palearctic, Ethiopian and Austro-Oriental regions, only one of its more than forty nominal species occurs on the Pacific islands.

Geotomus pygmaeus (Dallas).

Aethus pygmaeus Dallas, 1851 List Hemip. Brit. Mus., 1:120
Geotomus pygmaeus; Signoret, 1881 Ann. Mus. St. Nat. Genoa, 16:650

This species is extremely common and very widely spread on the islands of the Pacific. The extensive, complicated and as yet incompletely solved synonymy of *pygmaeus* prevents giving accurate distribution notes, but in general, materials seen by me have come from much of the southern Asiatic mainland and many of the far-flung islands of the Pacific world as far north as Japan and Hawaii. How much of this extensive range is due to "natural" spread and how much is due to human agency is not yet known.

The present series comprises 220 of the 270 specimens of Cydnidae taken by the expedition. As in all large series of this species, some variations in size and in extent of punctation on pronotum and scutellum exist; and an occasional individual possesses three instead of the usual two preocular, submarginal setigerous punctures. Two specimens, one a nymph, were noted from "open grass land" on May 16.

Bismarck Archipelago. — MANUS: Lorengau, June 18, 1 ex. — MUSSAU: Malakata, February 15, 5 ex.; Schadel Bay, February 14, 1 ex.; Talumalaus, January 17-20, 41 ex. — NEW IRELAND: Lemkamin, 900 m, April 5-21, 114 ex. — NEW BRITAIN: Yalom, 1000 m, May 16, 1 ad, 1 ny.

Philippine Islands. — TAWI TAWI: Tarawakan, October 20-24, 24 ex., November 11—14, 7 ex.; Lapid Lapid, November 21, 2 ex. — PALAWAN: Brooke's Point, Uring Uring, August 14-23, 21 ex.

Macroscytus Fieber, 1861 Europ. Hemip., pp. 83 and 362.

With more than thirty species, this genus occurs widely and only in the Old World. Three of the five species described from the general areas visited by the expedition were collected. In addition, two new species were found and are described below.

Macroscytus annulipes Horvath.

Macroscytus annulipes Horvath, 1919 Ann. Mus. Nat. Hungarici, 17:242

The 13 examples taken by the expedition agree well with specimens identified by comparison with Horvath's two types from New Guinea.

Bismarck Archipelago. — MUSSAU: Malakata, June 9, 11, 2 ex.; Talumalaus, January 19, 3 ex. — NEW BRITAIN: Cape Hoskins, Vaisisi, at Kavuvu River (St. 81), July 9, 1 ex.; Valoka, July 10, 12, 7 ex.

Macroscytus aquilus, new species.

Diagnosis: The single, submarginal setigerous puncture immediately anterior to the eye coupled with a single costal setigerous puncture and the unicolorous legs will separate both sexes of this species from all known species in the genus.

Description: Holotype male. Length of body, 7.78; elliptical, widest at mid-length.

Head: Length slightly greater than half width, 1.09 : 1.85; interocular width, 0,97; anterior outline a flattened semicircle; juga as long as clypeus, dorsally impunctate except for the three primary setigerous punctures; ocellus large, separated from eye by a space much less than its own diameter; jugum ventrally impunctate; maxillary plate closely punctate on posterior three-fifths; antennal segments, I, 0.36; II, 0.44; III, 0.45; IV, 0.56; bucculae about three-fourths as high as labial II, with few scattered large punctures; labium reaching apices of middle coxae, segments, I, 0.86; II, 1.03; III, 1.06; IV, 0.61.

Pronotum: Unicolorous black except for piceous hind margins and humeral angles; length slightly more than half width, 2.03: 3.87; anterior margin broadly, deeply, doubly emarginate; lateral margins converging from just anterior to basal notch, more abruptly and convexly so in apical third; hind margin weakly convex; five lateral submarginal setigerous punctures on anterior lobe, one at subbasal angle; anterior lobe impunctate except for

few scattered small punctures laterally and subapically; transverse impression absent, its site marked by an irregular, broad band of distinct punctures; hind lobe with scattered small to fine punctures almost to posterior margin.

Scutellum: Longer than wide, 2.89: 2.60, polished; discally, especially on apical third, with widely scattered, distinct punctures a little larger than those of pronotum.

Hemelytron: Piceous to black, concolorous with pronotum and scutellum; clavus with one complete, impressed row of punctures and a few extra basally; mesocorium with two complete, impressed rows of punctures, disc for full length with punctures more crowded than on scutellum and varying in size; exocorium with scattered punctures finer than those of scutellum; costa somewhat flattened, with one setigerous puncture subbasally and a row of fine, elongate punctures for much of its length; membranal suture very weakly bisinuate; membrane just surpassing apex of abdomen, hyaline with weak brown infuscation centrally.

Propleuron: Anterior convexity alutaceous, impunctate except for patch of small punctures lateral of acetabulum; impression strong, with a few punctures at bottom; posterior convexity polished, virtually impunctate; prosternal carina low but sharp.

Mesopleuron: Evaporatorium covering all of surface except broad, curved, polished band from antero-lateral angle to middle of posterior margin.

Metapleuron: Evaporatorium reaching more than three-fourths of distance to lateral margin of supporting sclerite; osteolar peritreme without a polished lobe apically.

Sternites: Shining, weakly and irregularly wrinkled laterally; each segment with a spattering of small punctures posterior to spiracles; visible sternites IV and V each with a setigerous tubercle near postero-lateral angle.

Legs: Unicolorous; anterior and middle pair not specifically modified; hind tibia with weak basal emargination followed by about 5-7 weak denticules.

Terminalia: Genital capsule smooth, polished, virtually impunctate; apical margin virtually straight.

Female: Very similar to male, but with lateral abdominal wrinkles stronger and more numerous and hind tibia not modified as there.

T y p e d a t a: Holotype ♂ (April 12), allotype ♀ (April 5) and

two paratype females (April 12 and 17), all from Bismarck Islands, NEW IRELAND: Lemkamin, 900 m, 1962, Noona Dan Expedition (Zool. Mus., Copenhagen; one paratype, USNM).

Comments: In the absence of outstanding characters, the euphonious and generally descriptive name *aquilus* is given. It is Latin for dark colored or blackish.

Macroscystus noonadanae, new species.

Diagnosis: Among those species of the genus with a single preocular, submarginal setigerous puncture on each jugum, and unicolorous femora, this species differs from all except *pfeifferi* by having a sharply impressed row of punctures across the transverse pronotal impression and no abdominal punctures mesad of the triangular patch of crowded fine punctures posterior to the spiracles. From *pfeifferi* the males differ mainly by having one to three faint tubercles distad of the basal emargination on the ventral margin of the posterior tibia rather than the large, triangular angulation of *pfeifferi* (see comments below for separating females).

Description: Holotype male. Length of body, 7.95. Elongate, elliptical, sides subparallel; surface, except minutely alutaceous coria, polished.

Head: Length nearly two-thirds of width, 1.20 : 1.89; interocular, width 0.92; anterior outline semicircular; juga as long as clypeus, dorsally impunctate except for the three primary setigerous punctures; ocellus large, separated from eye by a space distinctly less than its own diameter; jugum ventrally impunctate; maxillary plate coarsely and closely punctate on posterior three-fifths; antennal segments, I, 0.39; II, 0.45; III, 0.65; IV, 0.79; V, 0.97; bucculae almost as high as labial segment II, with a few scattered large punctures; labium reaching hind margin of middle coxae, segments, I, 0.70; II, 1.17; III, 1.04; IV, 0.52.

Pronotum: Unicolorous; length about half width, 1.95 : 3.71; anterior margin broadly, shallowly concave; side margins converging from basal notch, more convexly so in apical third; hind margin weakly convex; 3 lateral submarginal setigerous punctures on anterior lobe and 1 in subbasal angle of posterior lobe; anterior lobe with distinct punctures forming an arcuate, subapical transverse band and irregular patch on each side; transverse impression abruptly impressed, with a row of strong punctures, both inter-

rupted medially; hind lobe with several irregularly spaced punctures discally.

Scutellum: Longer than wide, 3.06 : 2.47; polished, with numerous coarse, weakly sunken punctures irregularly spaced over most of surface except on base and in basal angles.

Hemelytron: Virtually unicolorous, little paler than pronotum and scutellum; clavus with one complete impressed row of punctures and some punctures basally; mesocorium with two complete, strongly impressed rows of punctures paralleling claval suture, elsewhere with scattered punctures becoming coarser basally; exocorium with very few punctures, these finer than those of mesocorium; costa with two setigerous punctures; membranal suture very weakly bisinuate; membrane just surpassing apex of abdomen, hyaline, faintly clouded with fuscous on apical half.

Propleuron: Anterior convexity alutaceous, with numerous small punctures anteriorly and widely scattered minute ones on disc; impression strong, with crowded, very coarse punctures which become finer and sparser posteriorly, hind margin impunctate.

Mesopleuron: Dull and wrinkled evaporatorium covering all except curved, broad, polished band extending from antero-lateral angle to middle third of hind margin.

Metapleuron: Evaporatorium reaching about four-fifths to lateral margin of supporting sclerite; osteolar peritreme without a polished lobe apically.

Sternites: Shining, weakly and irregularly wrinkled except on middle third; each segment with triangular patch of dense, fine punctures posterior to spiracle; visible sternites II-V each with a small setigerous tubercle in postero-lateral angle.

Legs: Unicolorous; anterior and middle pair not specifically modified; posterior femur ventrally with a short but distinct spine subapically on each margin; posterior tibia (viewed anteriorily) ventrally with a weak basal emargination followed by a weak, blackened tubercle.

Terminalia: Genital capsule smooth, polished, virtually impunctate, apical margin very weakly sinuate medially.

Female: Very similar to male except hind tibia not modified as there.

T y p e d a t a: Holotype ♂, allotype ♀ (both October 8) and three paratype females (October 8-12), all from the Philippine Islands, BALABAC: Dalawan Bay, 1961, mercury lamp, Noona

Dan Expedition (Zool. Mus., Copenhagen; one paratype, USNM).

Comments: In structure this species is so very close to *pfeifferi,* with which it was collected, that one might readily consider it but a variant. However, experience with other members of the genus has convinced me that the secondary sexual characters of the male's hind leg are quite constant and serve reliably for separating species. The females of *noonadanae* are even more similar to that sex of *pfeifferi* and may be difficult to separate therefrom unless both species are present: *pfeifferi* females are longer, measuring 9.90-10.05 and have the color of the corium more nearly as dark as the scutellum and pronotum; the females of *noonadanae* are shorter, 7.65-8.40, and have the coria noticeably browner than the general blackish shade of the pronotum and scutellum.

Macroscytus pfeifferi Signoret.

Macroscytus pfeifferi Signoret, 1883 Ann. Soc. Ent. France, ser. 6, 3:468, pl. 13, fig. 126.

On the little island of Balabac, just north of the type locality island of Borneo, two males were collected. They agree very closely with specimens I determined by comparison with the type in the Naturhistorisches Museum in Vienna, Austria. A second species which is very similar to *pfeifferi* and collected with these two specimens is described elsewhere in this paper as *aquilus.*

Philippine Islands. — BALABAC: Dalawan Bay, October 7, 12, 2 ex., mercury lamp.

Macroscytus transversus (Burmeister).

Cydnus transversus Burmeister, 1834, Nov. Ac. Leop. Carol, 16 (supplement):291, pl. 1

Macroscytus transversus; Stål, 1876 Svenska Vet. Ak. Handl., 14(4):19

This species is reported for many localities from India, China and Japan south to Java and New Guinea.

The series taken by the expedition consists of two large (9.60 and 9.92) females from New Ireland and three small individuals, two males (7.28 ond 8.10) and one female (7.94) from the Philippine Islands. There appears to be no other reason to doubt their specific identity.

Bismarck Archipelago. — NEW IRELAND: Lemkamin, April 12, 17, 2 ex., mercury lamp.

Philippine Islands. — BONGAO I: Port Bongao, November 26, 2 ex. — PALAWAN: Uring Uring, Brooke's Point, August 25, 1 ex.

Summary.

The 270 Cydnidae collected by the expedition to the Philippine Islands and the Bismarck Archipelago contained ten species in four genera. These numbers represent about half of the genera and species described from the areas visited. Four of the species were new, two in *Chilocoris* and two in *Macroscytus*.

Entomologiske Meddelelser 35 (1967)

Ny dansk vikler, Laspeyresia conicolana Heylaerts (Lep., Tortr.).

Af
Niels L. Wolff
Zoologisk Museum, København.

De til viklerslægten *Laspeyresia* Hb. hørende arter afviger med hensyn til larvernes levevis fra den for de fleste viklere sædvanlige, idet de ikke findes mellem sammenspundne blade, men indboret i plantedele, oftest frø eller frugter. De enkelte arter lever monofagt, men blandt foderplanterne er repræsenteret en række forskellige plantefamilier såsom ærteblomstrede, skærmblomstrede, rosenfamilien m.m.

En gruppe af arterne er knyttet specielt til nåletræ (Coniferae), hvor larverne lever i barken eller for fleres vedkommende i koglerne; en enkelt i de harpixklumper, som er forårsaget af tidligere angreb af en anden vikler. I en med genitaltegninger (♂, ♀) illustreret oversigt over de i Finland forekommende *Laspeyresia*-arter, der er tilknyttet nåletræer, opregner Krogerus (1962) følgende 8 finske arter: (1) *Laspeyresia* (eller *Pseudotomoides* Obr.) *strobilella L.* (larven i grankogler), (2) *Laspeyresia cosmophorana* Tr. (larven i harpixklumper, tidligere beboet af *Evetria resinella* L.), (3) *L. coniferana* Sax. (larven under bark, særlig af skovfyr), (4) *L. illutana* HS. (larven i grønne kogler af rødgran), (5) *L. cognatana* Barr. (larven i bark af skovfyr), (6) *L. pactolana* Zell. (larven under bark, særlig af rødgran), (7) *L. interruptana* HS. (larven ikke kendt, formentlig knyttet til fyr) og (8) *L. duplicana* Zett. (larven under bark, særlig på enebærbuske). Af disse 8 arter er de 6 (nemlig no. 1, 2, 3, 5, 6 og 8) tillige fundet såvel i Sverige som i Danmark.

Gruppen omfatter imidlertid endnu en art, *Laspeyresia conicolana* Heyl. (larven i kogler af skovfyr), som ikke er kendt fra de skandinaviske lande. Denne arts udbredelse er mere sydlig

(fra det sydøstlige hjørne af England, over Holland, Frankrig, Nordvesttyskland, Østrig til Albanien og Tyrkiet). En afbildning af imago samt af ♂-genitalierne ses hos Bradley (1959) og Hannemann (1961), af ♀-genitalierne hos Bradley (1959).

Blandt forstkandidat C. S. Larsen's tiloversblevne materiale af danske micros, som jeg har arvet, henstod nogle kasser med ikkeordnede dyr, han selv havde fanget i de seneste år. Nogle af disse satte jeg til side til nærmere undersøgelse ved lejlighed. En *Laspeyresia,* etiketteret »Rislebæk, Faaborg 27/3 42«, som jeg først for nyligt har dissekeret, viste sig at være en ♂ af *L. conicolana* Heyl. Af etiketten ses dels, at den var et af de sidste dyr, sandsynligvis det sidste, Larsen tog i sin ejendom, inden han flyttede til Odense, dels at den må være fundet indendørs. Larven overvintrer i koglerne af skovfyr, og klækningen må være fremskyndet af varme, hvorfor den antagelig stammer fra fyrrekogler, som Larsen fra sine plantninger ved Fåborg har bragt indendørs.

Arten kan forvexles med *L. cosmophorana,* da den har samme skarpe sølvlinier tværs hen over forvingen som denne. Bradley (1959) gør opmærksom på, at disse linier er omtrent usynlige set ovenfra, hvilket også fremgår af hosstående fig. 1, der viser et fotografi af det danske exemplar af *conicolana,* og hvor linierne end ikke kan anes. Dette forhold skyldes imidlertid, at sølvskællenes reflexvirkning er anderledes end hos *cosmophorana,* hvorved tegningerne hos *conicolana* først træder frem, når lyset falder skråt på vingen. Et godt kendetegn, som også nævnes af Bradley, er at bagbenene er mørkebrune hos *conicolana,* hvide hos *cosmophorana.* Fig. 2—3—4 viser tre andre nåletræsarter, der kan minde om *conicolana,* nemlig henholdsvis *L. cosmophorana, L. coniferana* og *L. strobilella.*

♂-genitalierne af de fire omtalte arter er afbildet som henholdsvis fig. 5—6—7—8. Foruden forskellen i formen af valverne bemærkes, at cornuti-besætningen er klart forskellig fra art til art. Hos *conicolana* består cornuti af 18—20 ret korte, omtrent lige lange torne anbragt i række, hos *cosmophorana* af tre adskilte sæt, det ene med 3—4 lange, de to andre med 6—7 korte torne, hos *coniferana* af ét sæt med 9—11 korte torne i række, og endelig hos *strobilella* af to sæt, det ene med 3—4 lange, det andet med 3—6 korte torne i række.

Det danske fund af *Laspeyresia conicolana* Heyl. betegner en nordgrænse for denne arts hidtil kendte udbredelse.

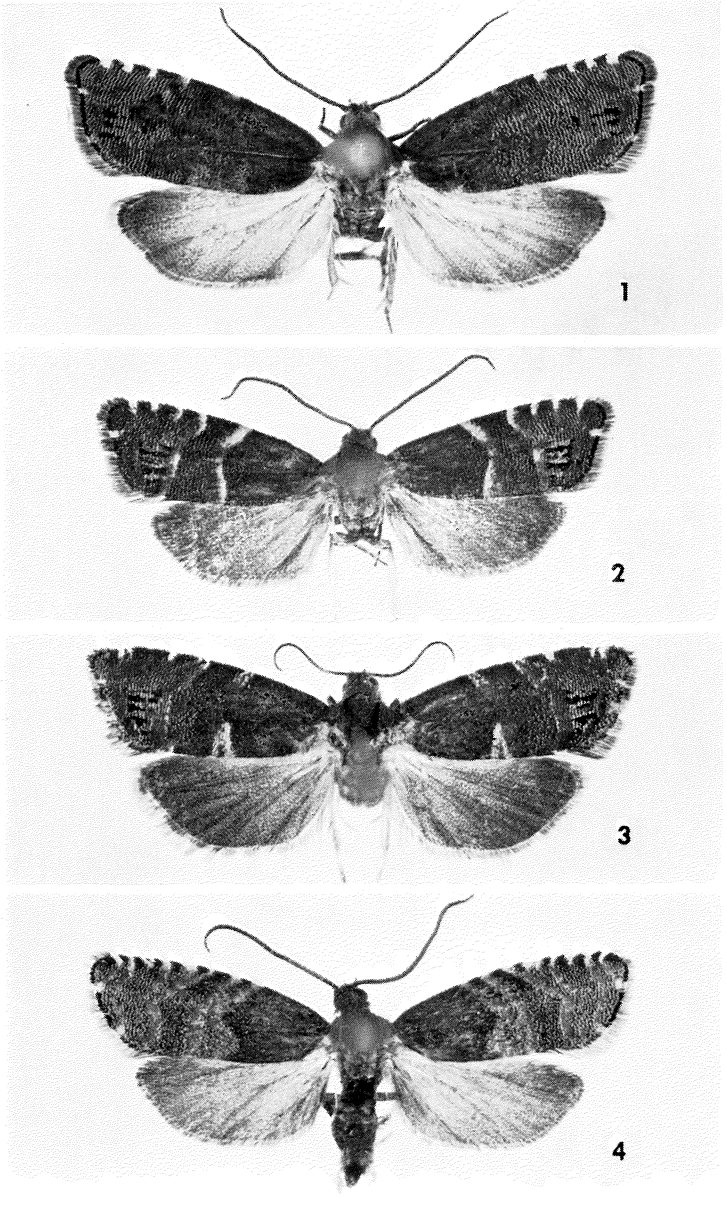
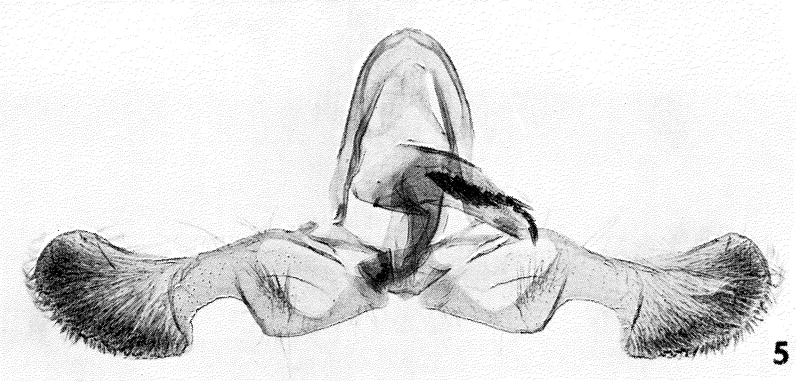


Fig. 1—2—3—4: *Laspeyresia*-arter. Dania (× 6). Fig. 1: *L. conicolana* Heyl. Rislebæk, Fåborg 27.III.1942. C. S. Larsen leg. — Fig. 2: *L. cosmophorana* Tr. Asserbo 2.VI.1949. Niels L. Wolff leg. — Fig. 3: *L. coniferana* Sax. Pedersker, Bornholm 5.VIII.1953. Niels L. Wolff leg. — Fig. 4: *L. strobilella* L. Grib Skov 21.V.1943. Niels L. Wolff leg.



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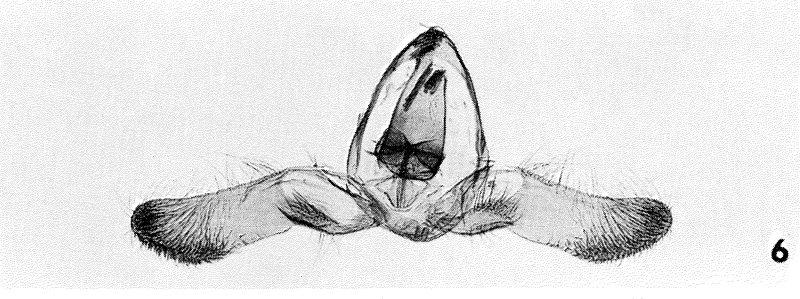

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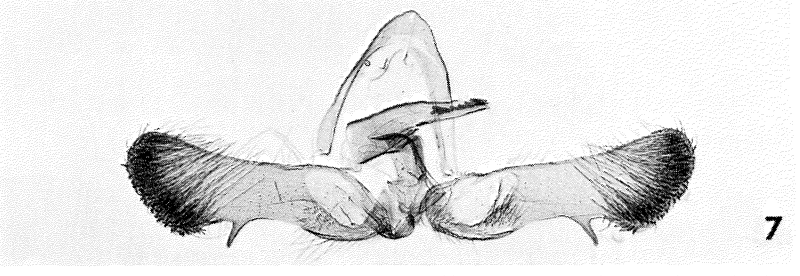

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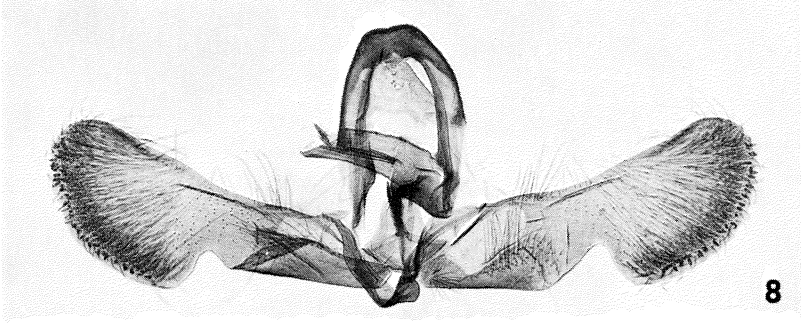

8

Jeg takker stud. mag. Bent W. Rasmussen, der har taget alle fotografierne, for hans værdifulde hjælp.

Summary.

Examination of some undetermined Danish Microlepidoptera collected by the late Mr. C. S. Larsen has disclosed a specimen of *Laspeyresia conicolana* Heyl. from Funen.This locality represents a new point of the northern border of distribution of this species. Photographs of *L. conicolana* Heyl., *L. cosmophorana* Tr., *L. coniferana* Sax., and *L. strobilella L.* including their male genitalia are added.

Litteratur.

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Fig. 5—6—7—8: ♂-genitalier af *Laspeyresia-arter* (× 40). Fig. 5: *L. conicolana* Heyl. (præp. NLW 3254). Samme ex. som vist fig. 1. — Fig. 6: *L. cosmophorana* Tr. (præp. NLW 2640). Samme ex. som vist fig. 2. — Fig. 7: *L. coniferana* Sax. (præp. NLW 2641). Asserbo 26.VII.1952. Niels L. Wolff leg. — Fig. 8: *L. strobilella* L. (præp. NLW 3255). Stenholt Vang ex l. 1.V.1944. Niels L. Wolff leg.

Om indsamling af Cryptocephalus biguttatus Scop. (Col., Chrysomelidae).

Af
Ole Jensen.
Strandvejen 63, Bredballe strand pr. Vejle.

Ifølge Victor Hansen: Fortegnelse over Danmarks biller (Ent. Meddr. 33, p. 361) er *Cryptocephalus biguttatus* kun fundet i 5 eksemplarer og alle i Jylland, nemlig: 1 eks. Ringkøbing (for mindst 100 år siden), Silkeborg-egnen: 1 eks. Jenskær ved Gedsø, 1 eks. Lysbro skov 30/6 1929, 2 eks. Rye Nørreskov nær Himmelbjerget 4/7 1946 og 26/7 1962. Endvidere oplyses, at arten angives at være knyttet til Erica tetralix, på hvis blomster den træffes.

Jeg har eftersøgt arten på tre jyske lokaliteter og kan oplyse følgende resultater:

Den 6/6 1964 ketsede jeg tre eksemplarer på klokkelyng (Erica tetralix) i Draved. Lokaliteten var en hede- og klokkelyng bevoksning, som var omgivet af små og store birke. Temperaturen var ca. 22° C, og der var helt vindstille — klokken var ca. 17.

Fra 14—21/8 1965 undersøgte jeg en lokalitet ved Søndervig ved Ringkøbing. Her var uhyre meget blomstrende klokkelyng; temmelig solrigt, dog fandt jeg ingen dyr — antagelig har tidspunktet været for sent på året.

Den 12/6 1966 besøgte jeg en lokalitet syd for Kolding, Svanemose, hvor jeg fra tidligere besøg kunne huske, at der fandtes klokkelyng. Jeg ketsede på en lokalitet, som meget ligner den i Draved, hvor jeg i 1964 havde ketset *C. biguttatus:* hede- og klokkelyng bevoksning med enkelte mindre birke imellem og omgivet af høje birke — altså en rigtig »gryde«. Temperaturen var 24° C, og tidspunktet var midt på eftermiddagen, men der var ingen *C. biguttatus.* — Sidst på eftermiddagen havde jeg sat mig midt på lokaliteten, og pludselig ser jeg et dyr kravle på klokkelyngen; det var arten — og nu udviklede det hele sig meget hurtigt — i løbet af et øjeblik kunne jeg inden for et område af ca. 10 m^2 se temmelig mange eksemplarer sværmende, krybende på klokkelyngen enten alene eller i parring. Dette varede ca. en halv time, så var solen nede bag de høje træer, og ingen dyr var mere at se.

Summary.

Till now considered a very rare species in Denmark *Cryptocephalus biguttatus* Scop. is recorded in numbers on Erica tetralix from two new localities (Jutland); in both places taken in June under certain conditions: calm weather, high temperature (22—24°C), and at about 5 p.m.

Entomologiske Meddelelser 35 (1967)

The Heteroptera fauna of Korshage, Zealand, in relation to vegetation in late summer.

By
Jens Böcher
Zoological Laboratory, Copenhagen.

CONTENTS

I. Introduction 28
II. Aims and methods 28
Sample lines 28
Collection 29
Time of collections, weather conditions etc. 31
III. The vegetation 33
IV. The Heteropterous fauna of the whole area 35
Dominance 35
Constancy 36
V. The Heteropterous fauna of the plant communities 38
1. Beach 39
2. Green dune
a. Outer green dune 40
b. Mixed green dune 40
c. Inner green dune 41
3. Dune pasture and swamp 41
4. Dune grassland
a. Thalictrum dune grassland 42
b. Carex dune grassland 43
c. Dune slack grassland 43
d. Grey dune 44
5. Dune scrub 45
6. Dune heath 45
7. Notes on the frequent species 47
8. The variation along the sample lines 50
VI. Heteroptera communities and concluding remarks 55
VII. List of species 58
VIII. Addendum 62
Acknowledgements 63
Summary 63
Tables 1—15 64

I. Introduction.

Korshage marks the western entrance to the Isefjord in the northern part of Zealand. It constitutes the northeastern point of the sandy, marine foreland which surrounds the diluvial, hilly Rørvig peninsula. Since 1939 part of Korshage has been a nature reserve. From a scientific point of view this area is of particular interest. Here one of the few remaining dune heaths on Zealand is found in connection with an element of continental plant species. Here also is a rapidly changing coastline: along the Kattegat erosion and smoothing of the coast-line is taking place, whereas opposite Korshage, on the Isefjord coast, a considerable amount of soil is accumulating and the land is extending eastward.

Schou (1945) has studied the evolution of land at Korshage from a geographical point of view. Botanically the area is well known as my father, T. W. Böcher (1945, 1952, 1954, etc.) has extensively analized the plant communities, and since 1934 has followed the vegetational succession connected with the build up of land.

During the late summers of 1963 and 1965 an investigation was carried out of the Heteropterous fauna (Geocorisae) of Korshage. The area investigated was restricted to the territory mapped in Fig. 1. Lying just southeast of the point, it measured about 500 $\times$ 200 m. Here the system of beach ridges, due to the exceedingly rapid accumulation of material, attains its maximum width and is especially distinct (Fig. 2). In connection with this accumulation of land, there is a well defined succession of plant communities from the Isefjord coast westward.

II. Aims and methods.

The purpose of the investigation was

1) qualitative, faunistic: What species of Heteroptera are living in the area?
2) distributional: Where in the area, in relation to the plant communities, are the different species found?
3) quantitative: In what numbers, relative to each other and/or to area-unit, do the different species occur?

Sample lines.

From the eastern coast into the land three "sample lines" (I, II and III, Fig.1) extends so as to traverse as many different plant

communities as possible. The lines were marked at 10 m intervals by means of stones or sticks. The purpose of the lines was 1) to facilitate the field work and 2) to serve as axes along which most of the samples were taken.

Collection.

The collection was undertaken in three ways: By sweeping the herbaceous[1]) vegetation with a heavy insect net, by searching directly on the ground, and by sifting the very low vegetation, especially mosses. In this way the main strata of the area were investigated, by far the most conspicuous of which is the herb (field) stratum (cf. next section).

Sweep net collections.

The predominance of the herb stratum made it natural that the main part of the samples was in the form of sweeping.

The value of sweeping as a method for quantitative research has been very much discussed (e.g. Palmgren 1930, Zubareva 1930, De Long 1932, Gray and Treloar 1933, Beall 1935, Carpenter and Ford 1936, Kontkanen 1937, Romney 1945, Jürisoo 1964). It is unnecessary to review the discussion here, but a few points may be stressed.

Theoretically, if two or more sweeping samples are to be fully comparable, they must be taken in a strictly uniform way by the same person at the same time (!) in vegetation, which has to be homogeneous, dry, neither too low nor too tall, and the weather must be optimal. The "optimal" weather conditions are difficult to define, depending on e.g. the climatic zone, but calm is preferable, and it must be neither unusually cold nor too hot for the season.

Some compromises are of course necessary to comply with these impossible demands. The operator has to perform the strokes with the net as uniformly as possible during the same (short) interval of the day (cf. Marchand 1953, Fewkes 1961, Jürisoo 1964) and more or less identical climatic conditions, and the whole period of investigation should be as short as possible in order to avoid too much change in the faunal composition (if it is not the seasonal changes that are to be studied).

[1]) As regards method of collection, the heath vegetation is considered "herb stratum" — in spite of the fact, that dwarf shrub is the main constituent.

Considering the huge mass of possible sources of error, it is really astonishing, that a number of earlier investigators (Sanders and Shelford 1922, Smith 1928, Shackleford 1929, R. Krogerus 1932, Romney 1945) independently found the yield of 50 sweeps[2]) to be approximately equivalent to the invertebrate population of one square meter[3]). This speaks in favour of the value of sweeping. The present author, however, is only willing to consider it a useful relative method, i.e. it is extremely difficult to relate sweep-net catch to area-unit. In any case, however, so far no other quantitative method has been able to replace the sweep-net; the various cylinder methods etc. (e.g. Beall 1935, Romney 1945, H. Krogerus 1948, Johnson, Southwood and Entwistle 1958) may be more accurate, but they are disproportionately laborious or costly and time consuming. — Sweeping has been used as the only sampling method in a good many modern quantitative investigations of Hemiptera (e.g. Kontkanen 1950, Marchand 1953, Schwoerbel 1957, Jürisoo 1964).

In the present investigation the u n i t s w e e p i n g s a m p l e was chosen as 5 0 s t r o k e s (cf. above). This is in accordance with Smith 1928, Shackleford 1929, R. Krogerus 1932, H. Krogerus 1948 and Marchand 1953. Collection was undertaken as follows. — The sweep net consisted of a bag 50 cm in depth fixed on a circular metal frame of 38 cm diameter and a short handle (45 cm). The sweeps were synchronized with the investigators stride when walking slowly along more or less straight lines. For every 10 strokes the contents of the net was examined and the bugs sorted out by means of a suction-bottle; after one sample (50 sweeps) the catch was killed by means of ethylacetate.

It may be pointed out, that the Heteroptera are among those groups of insects which are best suited for quantitative sweep-net collection. The majority of the species are plant suckers, but even the predators are often closely connected with the vegetation. As with the other hemipterous insects, the feeding habits of adults and immature stages, which are found together in the same environments, are usually identical. Only very few species (at least in northern Europe) are good performers on the wing or powerful leapers. That they are not powerful leapers is an advan-

[2]) With an insect net of about 30 cm diameter. — Sanders and Shelford: about 60 sweeps.

[3]) Romney: one square yard.

tage when compared with the leafhoppers (Homoptera Auchenorrhyncha); on the other hand, this latter group is more homogeneous ecologically, as it is made up of purely vegetarian species moving principally in plant cover accessible to the net (Kontkanen 1950), whereas many of the Heteroptera are more or less confined to the soil surface. This is the reason why it is necessary to introduce other means of collection besides sweeping into an investigation of the land bugs of a certain area.

Other methods of collection.

In localities with relatively sparse vegetation, the soil surface was searched directly, in most cases for one hour, which was considered the unit sample for this type of collection. No attempt was made to correlate the catch obtained by this method with the yield of the sweeping, i.e. to express the results with the same unit e.g. on a square meter basis. It was possible to examine 10—20 square meters per hour. It is inevitable that by searching a selection of the species belonging to the herb- and moss strata is caught in addition to the more permanent ground dwellers.

Samples were taken by sifting from places where mosses and other low plants were prominent. One tenth of a square meter was cut out by means of a sharpened circular metal frame, and the material immediately sifted through a coarse sieve onto a piece of plastic, from which the bugs were caught.

Only very few collections were obtained from the scattered trees and shrubs by beating branches below which a net was held.

Time of collection, weather conditions etc.

Information regarding date and hour of the collections together with some notes on the weather, is to be found in Table 1, which includes all the quantitative samples from the investigation (1—73) in chronological order. Nos. 1—51 date from 1963, Nos. 52—73 from 1965. It will be noticed that the samples were taken during a period of respectively 25 days (14/8—7/9 1963) and 37 days (24/8—29/9 1965). However, the period of sweeping in 1965 was more restricted (24/8—11/9: 19 days).

Most of the samples (66 %) were taken during two and a half hours in the afternoon (1^{30} to 4 p.m.) and the majority during approximately uniform weather conditions: air temperature 17—19°C (84 % of samples), more or less bright sunshine (92 % of

samples) and light to moderate breeze (71% of samples). The catch of six sweep-net samples may be negatively influenced by too strong a wind.

The weather of the two summers in question was relatively cool and wet. Unfortunately so, because this fact made the periods of study longer than desired, owing to the frequent rainy days during which collection was impossible and whereupon it was necessary to await the drying of the vegetation.

The sweep-net collection in 1965 was carried out in order to supplement the material obtained in 1963; most of the searching and sifting was done in 1965. Samples originating from 1963 and 1965, respectively, are combined and treated as a whole in the present paper. This is, admittedly, a very disputable procedure, considering the multitude of factors that might cause the fauna of the two years to be quite different. Pooling of the data seems justified when the following points are taken into account. 1) As mentioned above, the weather was very similar during each of the two summers, i.e. rather cool and wet. 2) It appears from the sweep-net samples that the general composition of the Heteropterous fauna was the same each late summer (cf. Table 3). However, there are some differences, e.g. it looks as if *Phytocoris varipes* in 1965 had exchanged places with *Notostira elongata* as regards abundance, and *Plagiognathus chrysanthemi* was commoner, apparently, in 1965 as compared with 1963. 3) When sweeping samples taken in some localities which in 1963 showed a peculiar fauna composition, are compared with samples obtained from the same places in 1965, they are seen to be fairly identical; (cf. No. 3 to 54 and Nos. 18—19—20 to 56, Table 3). — Notice, that sweeping samples from the oldest part of the dune heath were taken only in 1965. It is accordingly not possible to compare directly the considerable yield of the two samples in question (Nos. 65 and 66) with that of the samples from younger parts of the heath taken in 1963.

It must be stressed that the present investigation deals only with the late summer Heteropterous fauna. This is partly due to an erroneous assumption, based upon previous collections, that the species-composition was relatively constant in mid- and late summer. In addition, the paucity of immature stages in late summer facilitated identification. Recently I have found that the mid-summer aspect of the Korshage Heteropterous

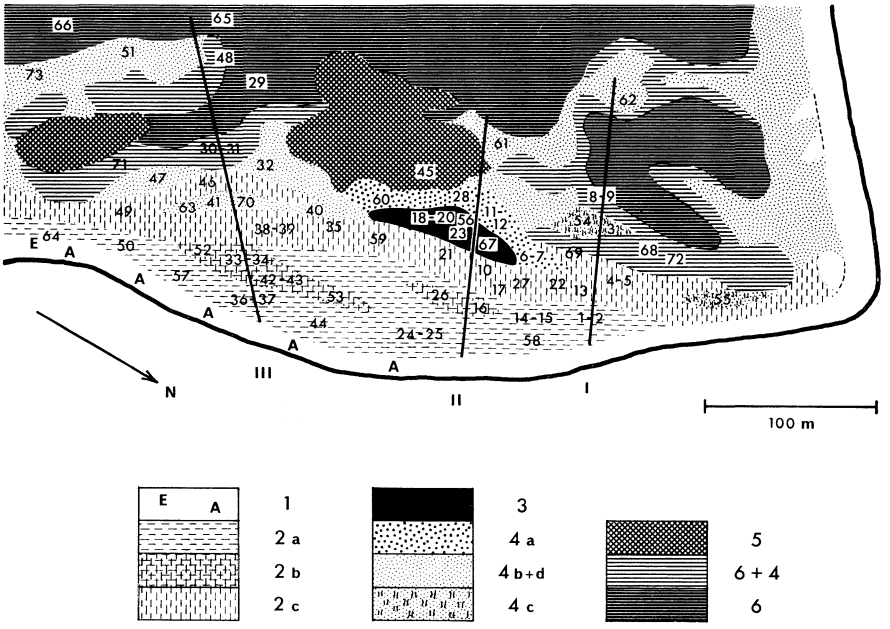

Fig. 1. Map of Korshage with plant communities and sample-localities indicated. 1—73: the numbers of samples (see Table 1). I, II, III: the three sample lines. — Signatures: (1) beach (and "white dune") with fore shore community dominated by *Atriplex* spp. (A) and *Elymus* (E), (2a) outer green dune, (2b) mixed green dune, (2c) inner green dune, (3) dune pasture and swamp, (4a) Thalictrum dune grassland, (4b+d) Carex dune grassland and grey dune, (4c) dune slack grassland, (5) dune scrub, (6+4) dune heath intermingled in dune grassland, (6) dune heath.

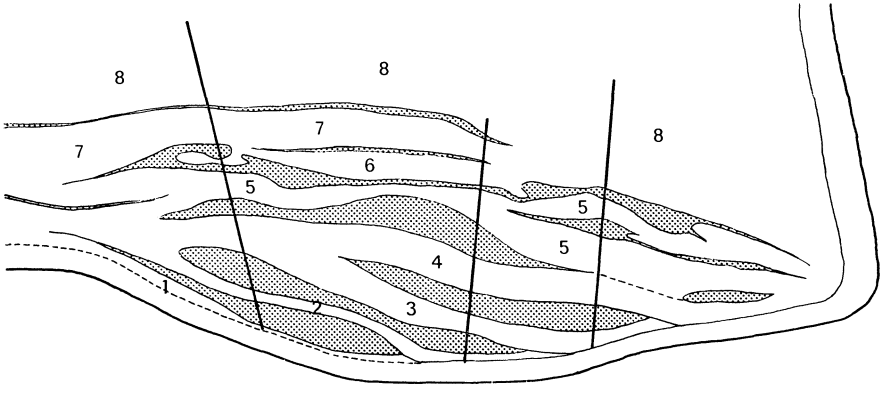

Fig.2. Map of the beach-ridge system of Korshage. The dotted signature indicates depressions between the numbered ridges. — Approximate ages of the beach ridges are as follows (based on T. W. Böcher 1952): (1) 1963, (2) 1941, (3) 1937, (4) 1911, (5) 1895, (6—8) before 1895.

Fig. 3. View from the point of Korshage in a southeasterly direction over the area investigated. In the foreground dense *Ammophila arenaria*-vegetation ("inner green dune"). More distant and to the left the extensive green dune area, in the centre advancing ("younger") dune heath behind which lies the deep depression containing swamp and dune pasture; to the right grey dune. In the background, left, the inlet of the Isefjord, to the right dune scrub and dune heath behind which a coniferous plantation is seen in the distance. — It is possible to distinguish the northernmost part of the beach-ridge system: to the left 4, in the centre 5, and to the right 8. (Compare Figs. 1—2).

Fig. 4. The Isefjord-beach in the southernmost part of the area studied, looking southwards. The vigorous fore shore community is dominated by *Atriplex litoralis* (left) and *Elymus arenarius* (right).

Fig. 5. The transition between swamp (left), dune pasture and "inner green dune" (in the background to the right: beach ridge 4). View towards the north. The shrubs in the middle distance are *Salix cinerea* (left) and *Juniperus communis* (right).

fauna, in fact, deviates greatly from that of late summer concerning both species-composition and relative abundance (see Addendum p. 62).

III. The vegetation.

The vegetation of Korshage constitutes a succession, or sere, of maritime dune communities replacing one another from the Isefjord coast westwards. The youngest seral stage is found on the most recently formed land on the eastern shore, the oldest (probably the local edaphic climax) is a dune heath occupying the western part of the area.

For the purpose of the present investigation a simplified division into plant communities was brought about, which appears in Table 2 and the map, Fig. 1. The terminology is in accordance with Warming (1907), T. W. Böcher (1953) and Burnet et al. (1964). The map was produced partly by means of an air photograph (taken 1959 by Geodætisk Institut, Copenhagen), partly by means of the author's own approximate mapping. Fig. 1 should be compared with Fig. 2, which shows the system of beach ridges together with some historical data concerning the growth of the land. This figure is, besides the author's rough mapping, based on T. W. Böcher (1952, Fig. 3), which in turn is based on the different editions of the topographical maps with a 1 : 20000 scale published by Geodætisk Institut, Copenhagen.

The division into plant communities is summarized below:

1. Beach.
2. Green dune:
   a. Outer green dune.
   b. Mixed green dune.
   c. Inner green dune.
3. Dune pasture and swamp.
4. Dune grassland:
   a. Thalictrum dune grassland.
   b. Carex dune grassland.
   c. Dune slack grassland.
   d. Grey dune.
5. Dune scrub.
6. Dune heath.

A few comments on this division may be given as follows. (For

further information about the flora and the successional stages, see T. W. Böcher 1945, 1952).

The beach of Korshage is composed of pebble and sand alternately, but "white dune" (= fore dune and mobile dune, cf. Warming 1907) is, at present, only found in a few places at the very tip and along the Kattegat coast. The Isefjord beach is largely occupied by a vigorous *Atriplex*-dominated fore shore community (A, Fig. 1), which is manured by the large quantity of decaying seaweed ("wrack") deposited here (Fig. 4).

Without transition the beach passes into the different "green dune" communities, in which *Ammophila arenaria* is the ruling species. East of beach ridge 2 the outer green dune is interspersed with patches of white dune and elements from the fore shore; this area constitutes the youngest seral stage apart from the beach. In the south the outer green dune is bordered against the beach by a fringe of *Elymus arenarius* (E, Fig. 1 and Fig. 4). The inner green dune community is first and foremost covering the prominent beach ridge 4. In the northern part of this the soil is stony ("shingle") and the plant cover is sparse; here the samples Nos. 10, 13, 22, 27 were taken. The rather varied "mixed" green dune vegetation is developed in the lower parts of the furrows between the younger beach ridges (former narrow "lagoons" locked up by spits or bars, cf. T. W. Böcher 1952).

West of beach ridge 4 a deep "valley" contains a small swamp, usually with open water, in the lowest part (Fig. 5); this is surrounded by a "dune pasture", which in turn is replaced (at higher level) by a characteristic steppe-like *Thalictrum minus*-dominated grassland. Other kinds of dune grassland are found in the western part of the beach ridge system, more or less dominated by *Carex arenaria*. A third type of grassland, which includes a few species suggesting drier salt marsh, is developed in two small hollows, former dune "slacks", in the north; it is here termed "dune slack grassland". — The locality, from which the samples Nos. 41, 63, 70 are collected, takes up a position intermediate between the "Carex dune grassland" and the "grey dune", which is very rich in mosses and lichens. A luxuriant form of this last mentioned is found as relic grassland areas in the advancing dune heath (samples Nos. 68, 69, 71, 72), whereas the samples Nos. 51, 61, 73 originate from a poor type of grey dune on the top of beach ridge 8.

A dune scrub dominated by *Ulex europaeus* (here originally in-

troduced by man) is covering parts of the beach ridges 5 to 8. Most of the constituents of the scrub are moreover found scattered throughout the area.

Already on beach ridge 4 the outposts of the *Calluna-Empetrum*-dominated dune heath make their appearance. Further westwards the heath is intermingled in the various kinds of dune grassland (Fig. 3), and on the western part of beach ridge 8 it reaches complete domination.

IV. The Heteropterous fauna of the whole area.

In discussing the abundance and occurrence of the different species of bugs in the samples, the following terms are used:

D o m i n a n c e.

The dominance is the relative frequency of the species. The degree of dominance is generally divided into three classes: dominant-, influent- and recedent species, but according to Kont-

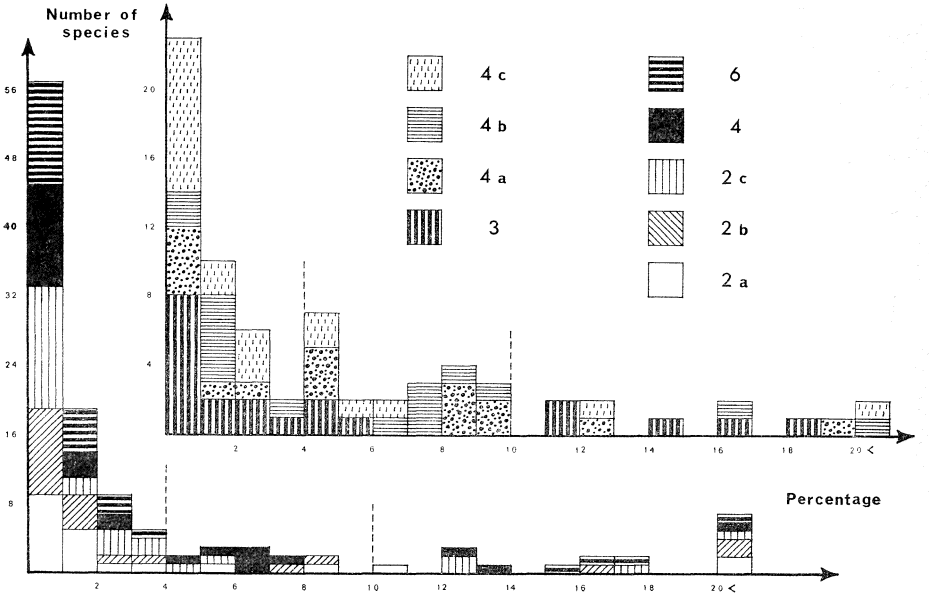

Fig. 6. The number of Heteroptera species which, for each of the plant communities investigated, belong to the different percentage categories. For an explanation of the figures representing the plant communities, see p. 33 and Table 2.

kanen (1948) the limitation of these groups is depending on the actual material: ... "it is (really) not possible to prescribe any definite limits for dominance groups, but each investigator will have to settle the matter in regard to his own material." (loc. cit. p. 35). In his ornithological research Palmgren (1930, p. 132) arrived at the classification: <2 %, 2—5 %, 5<% (of the total of individuals), whereas Kontkanen (1950) applies the limits <6 %, 6—15 %, 15<% in his investigation of leafhoppers. Regarding the present study, Fig. 6 is based on all the sweeping samples and shows the number of species which, for each of the plant communities, is belonging to different percentage categories. It appears, that neither of the classifications mentioned above is well fit for the material; 4 % and 10 % seem to be more natural limits. Accordingly, the following limitation will be used here:

Dominant species: 10< % of the number of individuals
Influent species: 10—4 % - - - - -
Recedent species: < 4 % - - - - -

Constancy.

In a quantitative investigation the percentage of the samples in which a certain species occurs is used to express the constancy of the species. The degree of constancy is divided into three classes, as was originally introduced into plant sociology by Brockmann-Jerosch (1907):

Constant species: in 50< % of the samples
Accessory species: - 25—50 % - - -
Accidental species: - < 25 % - - -

In the cases, from 1963, where two (in one instance even three) sweep-net samples were taken in the same locality, they were, unfortunately, not kept separate. This evidently complicates the calculation of the constancy, because it is impossible to know (when two or more individuals are caught) whether the species was present in both, or in only one of the samples. It was attempted to solve the matter as follows. If, in two mixed samples, more than three specimens of a species are caught, it is statistically most probable that it has been present in both samples. A corresponding calculation is applied in the single instance where three

samples were mixed. Consequently, the following values are used:

2 samples mixed:	1-3	specimens	are	distributed	onto	1	sample(s)
	3<	-	-	-	-	2	-
3 samples mixed:	1-2	-	-	-	-	1	-
	3-4	-	-	-	-	2	-
	4<	-	-	-	-	3	-

The procedure mentioned above is based on the assumption that the individuals are distributed at random in the vegetation, which they certainly are not. In any case, the exactness of the constancy calculation is not very satisfactory, the more "double samples" taken in the same plant community, the less reliable the values.

If the area investigated is considered as a whole, it is seen (Tables 3—5) to be characterized by the following species of Heteroptera (in order of dominance):

H e r b s t r a t u m (sweeping, Table 3).

Dominant and constant:	*Notostira elongata*
	Nabis pseudoferus
Influent and constant:	*Chorosoma schillingi*
	Phytocoris varipes
	Adelphocoris lineolatus
Influent and accessory:	*Ischnodemus sabuleti*
	Stygnocoris pedestris
	Myrmus miriformis
	Nabis ericetorum
Influent and accidental:	*Scolopostethus decoratus*
	Nysius thymi
Recedent and accessory:	*Nabis flavomarginatus*
(Recedent and accidental:	the remainder, 40 species)

In all 1907 specimens of bugs were caught by 56×50 = 2800 strokes of the net, i.e. averagely 0.68 individuals per sweep and 34.04 (± 25.81)[4]) per sample.

M o s s s t r a t u m (sifting, Table 4).

In the "moss stratum" a total of 123 bugs was caught from 19/10 square meter, i.e. averagely 63 individuals per square meter (variation from 24 to 160). — The predominant (and "constant")

[4]) The limits given are in all cases standard deviations.

species was *Plinthisus pusillus*. Another important moss dweller was *Acalypta parvula*.

Ground stratum (searching, Table 5).

Dominant and accidental:	*Scolopostethus decoratus*
	Ischnodemus sabuleti
Influent and constant:	*Alydus calcaratus*
Influent and accessory:	*Stygnocoris pedestris*
	Rhyparochromus pini
	Nabis pseudoferus
	Coranus subapterus
	Eremocoris abietis
	Geocoris grylloides

(Recedent and accessory or accidental: 25 species)

A total of 204 bugs (apart from *Ischnodemus sabuleti*, cf. p. 39) was caught during 10 hours searching, i.e. averagely 20.4 specimens per hour, (but the number varies from 6 to 76!).

It appears clearly, that the faunas of the three strata are highly different.

V. The Heteropterous fauna of the plant communities.

In this section the Heteropterous fauna of the different plant communities is examined and compared on the basis of all the collections obtained.

Most of the information appears in the tables (Tables 6—14, in addition to 3—5). For each community all the species found are listed in order of numbers caught, and for each species is given 1) the average number per sample, 2) the percentage of the total (dominance), 3) the percentage of the number of samples, in which the species occurs (constancy). A cross (×) means, that the species was found in the locality concerned, but not in a quantitative sample. — Abbreviations: D, dominant, I, influent, C, constant, Acs, accessory.

In some instances where the number of samples is small, a calculation of constancy is omitted, as the value would be extremely doubtful. — The "double samples" taken in 1963 (cf. p. 36) further causes the standard deviations (of the number of individuals per sample) to be less accurate.

A commented list comprising all the species of Heteroptera caught in the Korshage area is to be found below, p. 58.

1. Beach.

Searching (one sample, Table 5).

Only a single quantitative sample was taken on the beach, which involved half an hour's searching on the sand among the tussocks of *Elymus*. It was here seemingly possible to catch infinite numbers of *Ischnodemus sabuleti* in all stages of development, especially instar II. Undoubtedly, most of the individuals were pushed down from the lyme-grass, in the sheats of which they were hiding in abundance, so it was not considered worthwhile to collect and count them. The specimens of *Piesma quadratum* and of *Orthotylus flavosparsus* that were caught, may have blown down from their host plants (*Atriplex* spp.) nearby, as it was a windy day.

Special collection.

The bugs caught (beating and sweeping; August 28 and 30, 1963) on some of the commoner plant species of the fore shore community are listed below. The signs express the relative abundance: × = not common (less than 5 specimens caught), ×× = common (5 or more specimens caught), ××× = abundant.

	Atriplex litoralis	Atriplex hastata	Cakile maritima	Elymus arenarius
Aelia acuminata				×
Ischnodemus sabuleti				×××
Stygnocoris pedestris	×			
Piesma quadratum	×			×
Nabis ericetorum	×			
Anthocoris nemoralis	×××			
Anthocoris nemorum	××	××		
Orthotylus flavosparsus	××	××		
Lygus maritimus	×××	×××		
Lygus pratensis	×			
Lygus rugulipennis	×			
Orthops cervinus	××	××		
Calocoris norvegicus			×	

Lygus maritimus was present in huge numbers (many hundreds, adults and nymphs) on each average-sized *Atriplex*-plant, where it was the commonest insect, (the commonest but one being *Coccinella septempunctata).*

2. Green dune.

a. *Outer green dune.*

Sweeping (ten samples, Table 6).

Three species are dominant and constant: *Ischnodemus sabuleti, Notostira elongata* and *Nabis pseudoferus.* Two species are influent and constant: *Chorosoma schillingi* and *Phytocoris varipes.*

Characteristic of the Heteropterous fauna of this community is the dominance of *Ischnodemus sabuleti* (the other dominants and influents are characteristic of the area as a whole, cf. p. 37). It appears from Table 3, that the number of *Ischnodemus* is highly varying in the different samples (from 1 to 52 specimens per sample). This is presumably partly due to the fact, that this species in the Korshage area seems to prefer *Elymus* to *Ammophila* as host plant, (cf. Tischler 1960); it is abundant only in samples from localities rich in *Elymus* (Nos. 36-37, 50; cf. Table 3 and below). The variation in number of *Ischnodemus* causes the large standard deviation of the average number of individuals per sample (31.4 ± 21.9); if the species is excluded the value is 21.1 ± 4.4.

Another characteristic is the occurrence of some species belonging to the fore shore community: *Piesma quadratum, Orthotylus flavosparsus* and *Lygus maritimus* (cf. p. 39). — It is further notable, that *Adelphocoris lineolatus,* which is influent and constant in the area as a whole, does not play a significant part in this community (0.3 per sample).

Searching (two samples, Table 5).

The two samples are very different: *Ischnodemus sabuleti* is abundant in No. 57, but is completely absent from No. 58. This reflects the differing ages of the localities in question. No. 57 is taken in the youngest part, where *Elymus* is common, whereas No. 58 originates from the oldest part of the outer green dune, (cf. Table 2).

b. *Mixed green dune.*

Sweeping, only (eight samples, Table 7).

Three species are dominant and constant: *Notostira elongata, Nabis pseudoferus* and *Chorosoma schillingi.* Two species are influent and constant: *Phytocoris varipes* and *Myrmus miriformis.*

Differences from the preceding community are 1) the scarcity of *Ischnodemus sabuleti* and 2) that *Myrmus miriformis* is play-

ing a certain part. — *Adelphocoris lineolatus* has got the same low frequency as in the outer green dune.

Sweeping the voluminous bushes of *Rosa rugosa* growing east of beach ridge 4 yielded a few *Nabis pseudoferus* and *Nabis ericetorum,* but no phytophagous bugs.

c. *Inner green dune.*

S w e e p i n g (ten samples, Table 8).

Four species are dominant and constant: *Notostira elongata, Chorosoma schillingi, Phytocoris varipes* and *Nabis pseudoferus.* Two species are influent and accessory: *Adelphocoris linolatus* and *Stygnocoris pedestris.*

In this community the fauna is more varied than in the outer parts of the green dune, without doubt reflecting the richer flora. New species are added and more species are common in the samples. It is remarkable that now, suddenly, *Adelphocoris lineolatus* is rather frequent (cf. p. 47). *Ischnodemus sabuleti* is still present and also some other elements of the beach fauna were caught here *(Piesma quadratum, Lygus maritimus).* — Notice the increasing influence of *Nabis ericetorum.*

S e a r c h i n g (two samples, Table 5).

Searching was carried out on the "shingle" in the northern part of beach ridge 4. Besides the real ground dwellers, such as *Rhyparochromus pini* and *Coranus subapterus,* it appears that some inhabitants of the herb- and moss strata were caught (e.g. *Chorosoma schillingi, Polymerus brevicornis;* and *Pionosomus varius, Plinthisus pusillus,* respectively).

S i f t i n g (two samples, Table 4).

Half a square meter of *Dicranum scoparium* from the "shingle" was examined. It was inhabited chiefly by the two small lygaeids, *Plinthisus pusillus* (20 per m^2) and *Pionosomus varius* (14 per m^2).

3. D u n e p a s t u r e a n d s w a m p.

S w e e p i n g (six samples, Table 9).

Five species are dominant and constant[5]): *Myrmus miriformis, Phytocoris varipes, Plagiognathus chrysanthemi, Nabis pseudoferus* and *Adelphocoris lineolatus.* Three species are influent and

[5]) In this community the constancy-calculation is exceedingly unreliable.

constant or accessory: *Megalocoleus molliculus, Notostira elongata* and *Nabis flavomarginatus.*

In this compound community is found a Heteropterous fauna which is quite different from that met with in the green dune communities. *Myrmus miriformis* and *Adelphocoris lineolatus* are dominants here, whereas *Notostira elongata* and particularly *Chorosoma schillingi* are less important; and three species, which in the green dune were absent or playing a negligible part, are dominant or influent: *Plagiognathus chrysanthemi, Megalocoleus molliculus* and *Nabis flavomarginatus.*

A further characteristic is the occurrence of a markedly hygrophilous fauna element consisting of *Adelphocoris seticornis, Eurygaster testudinaria* and *Polymerus palustris* which were only found in this, the most humid part of the area.

Special collection.

Sweeping and beating the few bushes of *Salix* spp. around the swamp yielded the bugs listed below. None of them are true willow species. Less than 5 specimens were caught of each species.

	Salix cinerea	Salix repens
Eurygaster testudinaria	×	
Picromerus bidens		×
Anthocoris nemoralis	×	
Anthocoris nemorum	×	
Adelphocoris seticornis		×
Phytocoris varipes		×

4. Dune grassland.

a. *Thalictrum dune grassland.*

Sweeping, only (six samples, Table 10).

Two species are dominant and constant: *Adelphocoris lineolatus* and *Notostira elongata.* Four species are influent and constant: *Myrmus miriformis, Polymerus brevicornis, Chorosoma schillingi* and *Phytocoris varipes,* while four species are influent and accessory or accidental (the constancy-values are not reliable): *Nysius thymi, Megalocoleus molliculus, Ortholomus punctipennis* and *Orthops kalmi.*

The bug fauna of this steppe-like community is very interesting

in several respects: 1) The large number of influents seems to show a peculiar structure of the fauna which may be connected with the low mean number per sample; however, this cannot be the only reason (cf. the green dune communities). 2) The remarkable predominance of *Adelphocoris lineolatus*. 3) The absence of *Nabis pseudoferus* (at least as an adult) and the general scarcity of nabids, which may be due to the lack of a dense grass cover. 4) The comparatively high frequency of *Polymerus brevicornis* and *Ortholomus punctipennis* which must be considered rare species in Denmark. The same applies to *Polymerus vulneratus* and *Globiceps fulvicollis* of which a single specimen was caught.

b. *Carex dune grassland.*

S w e e p i n g (five samples, Table 11).

Two species are dominant and constant: *Notostira elongata* and *Nabis pseudoferus*. Five species are influent and constant: *Phytocoris varipes, Nabis ericetorum, Adelphocoris lineolatus, Chorosoma schillingi* and *Stygnocoris pedestris. Myrmus miriformis* is dominant, but only accidental.

The fauna of this community lacks characteristic features; in general it is very much like the fauna of the green dune. The only real difference seems to be the frequency of *Nabis ericetorum*. — One of the samples (No. 62) differs from the rest on account of the large number of *Myrmus miriformis,* which is absent from the other samples.

S i f t i n g (one sample, Table 4).

As might have been expected, sifting mosses etc. in the locality mentioned p. 34 yielded a result almost identical to that of sifting in the grey dune (cf. p. 44).

S e a r c h i n g (one sample, Table 5).

This one-hour sample gave a meagre yield, but was remarkable because of the discovery of the rare species, *Ceraleptus lividus*.

c. *Dune slack grassland.*

S w e e p i n g, only (three samples, Table 12).

Two species are dominant: *Nysius thymi* and *Adelphocoris lineolatus,* four species are influent: *Chorosoma schillingi, Nabis ericetorum, Myrmus miriformis* and *Notostira elongata.*

The striking feature of this community is the very high fre-

quency of *Nysius thymi* which is difficult to explain. Apart from this the fauna composition resemble very much that of the Thalictrum dune grassland (e.g. the dominance of *Adelphocoris lineolatus),* but the nabids — especially *Nabis ericetorum* — are comparatively frequent here (owing to the more continuous grass-cover?).

d. *Grey dune.*

Sifting (three samples, Table 4).

The yield from half a square meter of mosses in the "luxuriant" grey dune appears from the table; *Plinthisus pusillus* is the strongly dominating species (average 46 per square meter).

By sifting in the poor grey dune an attempt was made to restrict each of the 1/10 m^2 - samples to only one moss-species. The results are listed below (× = less than 5 per 1/10 m^2; ×× = 5 or more per 1/10 m^2).

	Rhacomitrium canescens	Hypnum cupressiforme	Dicranum scoparium
Sciocoris cursitans		×	
Macrodema micropterum			××
Pionosomus varius	×		
Plinthisus pusillus	×	××	
Acalypta parvula	×	××	

Searching (four samples, Table 5).

The yield of two hours searching in the luxuriant type of grey dune is listed below.

	Number of individuals	Percentage of total	
Alydus calcaratus	10	25	D
Coranus subapterus	10	25	D
Geocoris grylloides	8	20	D
Chorosoma schillingi	3	7.5	
Sciocoris cursitans	2	5	
Eremocoris abietis	2	5	
Rhyparochromus pini	1	2.5	
Stygnocoris pedestris	1	2.5	
Nysius thymi	1	2.5	
Nabis pseudoferus	1	2.5	
Nabis ericetorum	1	2.5	
Total:	40	100	

It appears, that *Alydus calcaratus, Coranus subapterus* and *Geocoris grylloides* are the dominating species; however, there is considerable difference between the catches of samples No. 68 + 72 and No. 71.

The sample originating from the poor grey dune (No. 61) shows the Heteropterous fauna to be poor too; *Rhyparochromus pini* is probably the dominating species. — It may be added, that a further search (half an hour) on the southern part of beach ridge 8 did not yield any bugs.

5. Dune scrub.

Sweeping (one sample, Table 3).

The catching of the single sweep-net sample from the *Deschampsia flexuosa-Chamaenerium-Rubus* - dominated vegetation among the scrub appears in the table. *Phytocoris varipes* was the most frequent species.

Special collection.

The bugs beaten from some of the components of the scrub are listed below (× = 1—4 specimens; ××× = abundant). *Ulex europaeus* was not examined because most of the bushes had been killed during the preceding winters. *Pilophorus perplexus* was caught among numerous ants *(Lasius fuligineus)* and aphids.

	Juniperus communis	Quercus robur	Sarothamnus scoparius
Nabis pseudoferus			×
Nabis ericetorum			×
Anthocoris nemoralis			×
Pilophorus perplexus		×	
Orthotylus virescens			×××
Lygus maritimus	×		

6. Dune heath.

Sweeping (seven samples, Table 13).

Three species are dominant and constant: *Scolopostethus decoratus, Stygnocoris pedestris* and *Nabis ericetorum.* One species, *Orthotylus ericetorum,* is dominant and accessory. There were no influents.

The Heteropterous fauna of the dune heath is easily charac-

terized: by the dominance of four species which are not particularly frequent in any of the other communities studied, two of the species do not even occur in the samples taken outside the heath *(Scolopostethus decoratus* and *Orthotylus ericetorum).* This also applies to a number of other true heath-species: *Nysius helveticus, Macrodema micropterum* and *Pitedia juniperina.* Further, the general structure of the fauna is remarkable: the distinction between the four dominants and the rest, without influents interposed. Besides the typical heath-species "the rest" is made up by inhabitants of the plant communities intermingled in the younger parts of the heath. This is easily seen when the samples taken in such localities (Nos. 8—9, 30—31) are compared with samples from the pure, old dune heath on beach ridge 8 and beyond this (Nos. 29, 65, 66; Table 14).

It is interesting that *Orthotylus ericetorum* was exclusively found in the old heath. — The number of individuals per sample in the older dune heath is quite another order of magnitude than in the other plant communities of the area; (cf. Nos. 65, 66; Table 3).

S e a r c h i n g (one sample, Table 5).

What was valid regarding the sweeping also applies to the searching: the number of individuals caught is of quite another order compared with the other communities searched. One hour's searching amongst and beneath the heather and crowberry on beach ridge 8 yielded 76 specimens of nine species (two more species were added later). Here, too, *Scolopostethus decoratus* was dominating together with *Stygnocoris pedestris.* A high degree of preference for either of the two species of dwarf shrub was noted as follows:

Underneath *Calluna:*	*Stygnocoris pedestris*
	Ischnocoris angustulus
	Scolopostethus decoratus
Underneath *Empetrum:*	*Rhyparochromus pini*
	Eremocoris abietis

It is unusual that but a single specimen of *Nabis ericetorum* was found. On other occasions (when the species was directly hunted for) at least ten might be caught per hour.

Searching in the younger parts of the dune heath revealed the same preferences as mentioned above, but a lower frequency and

fewer species. The following were found (beach ridge 5, 15/9 1963): *Rhyparochromus pini, Scolopostethus decoratus, Eremocoris abietis* and *Charagochilus gyllenhali.*

The bug fauna of the Korshage dune heath resemble very much that described by Rabeler (1947) from the "Calluneto-Genistetum" in northwestern Germany.

7. Notes on the frequent species.

The column diagrams (Figs. 7—8) are based on the average number of individuals per swep-net sample of certain species in the different plant communities; the outer green dune and the dune heath are divided into their younger and older portions. Fig. 7 includes the most constant species (apart from *Stygnocoris pedestris),* whereas Fig. 8 deals with the less constant, though frequent species. — The figures summarize some of the trends mentioned in the previous part of this section, and additional features may appear:

Myrmus miriformis seems to be somewhat hygrophilous, as it is most numerous in the humid part of the area. Regarding the green dune communities it is accordingly most frequent in the lower, luxuriant localities (2b). — *Chorosoma schillingi* is rather the opposite of *Myrmus* in being least common (apart from the heath) in the dune pasture and swamp, from which the prefered host plant, *Ammophila arenaria* (Southwood and Leston 1959), is absent. *Chorosoma* is especially numerous in the older parts of the green dune. — *Nabis flavomarginatus* is presumably moderately hygrophilous like *Myrmus miriformis,* but the species is fairly infrequent throughout the area. — *Nabis pseudoferus* is very frequent in the green dune communities and in the Carex-gassland, but in the other kinds of grassland it decreases in number and is completely absent from the older heath. — *Nabis ericetorum* in a striking way acts as a "vicariant" to *N. pseudoferus:* it is numerous in the heath, while playing an insignificant part in the green dune. — *Adelphocoris lineolatus* shows a marked frequency-maximum in the various kinds of grassland and in the dune pasture and swamp. This is undoubtedly connected with the feeding habits of the species, which exclusively feeds on Papilionaceae spp. (Southwood and Leston 1959). Of these only one species *(Lathyrus maritimus)* is found in the outer parts of the green dune, whereas further inland it is replaced by

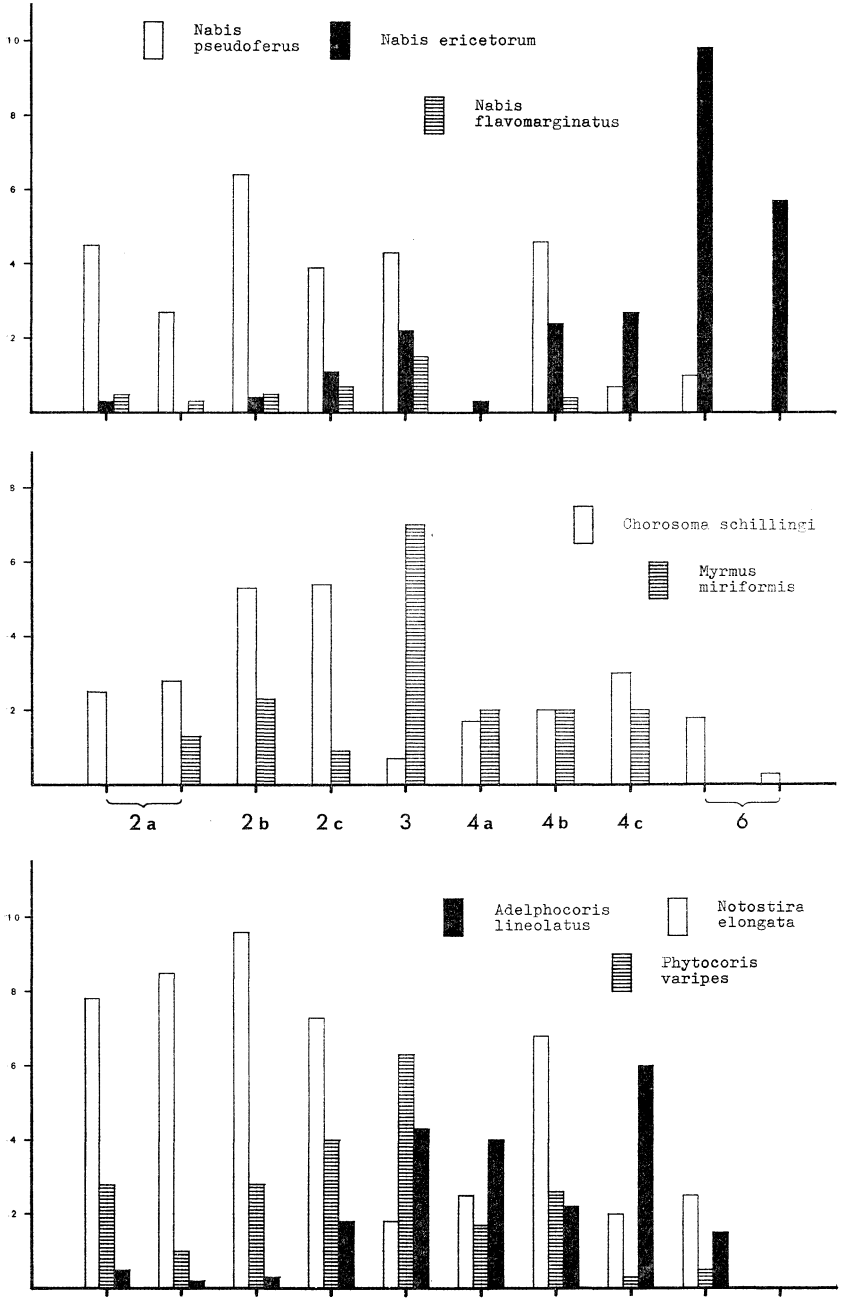

Fig. 7. Horizontal axis: plant communities (cf. p. 33 and Table 2), vertical axis: number of individuals per sample.

several species (cf. Table 2). — *Phytocoris varipes* manifests some preference for the damp localities in contrary to *Notostira elongata,* which is less common here and in the other inland communities (except the "Carex dune grassland"), while it is abundant in the green dune. — Notice the almost parallel variation in number of *Chorosoma schillingi, Nabis pseudoferus* and *Notostira elongata.*

Fig. 8 illustrates the erratic pattern of frequency and distribution which holds good for some of the species. The incidences have all been mentioned in the preceding text.

Considering the other methods of collection (searching and sifting) the material obtained is too small to permit a comparison corresponding to that carried out for the sweeping samples. Nevertheless, a few remarks may be advanced with reference to the searching-material (Table 5).

None of the species are very constant, only one — namely *Alydus calcaratus* — was found in more than fifty percent of the samples. This species was particularly frequent in one of the samples from the grey dune. *Geocoris grylloides* apparently prefers

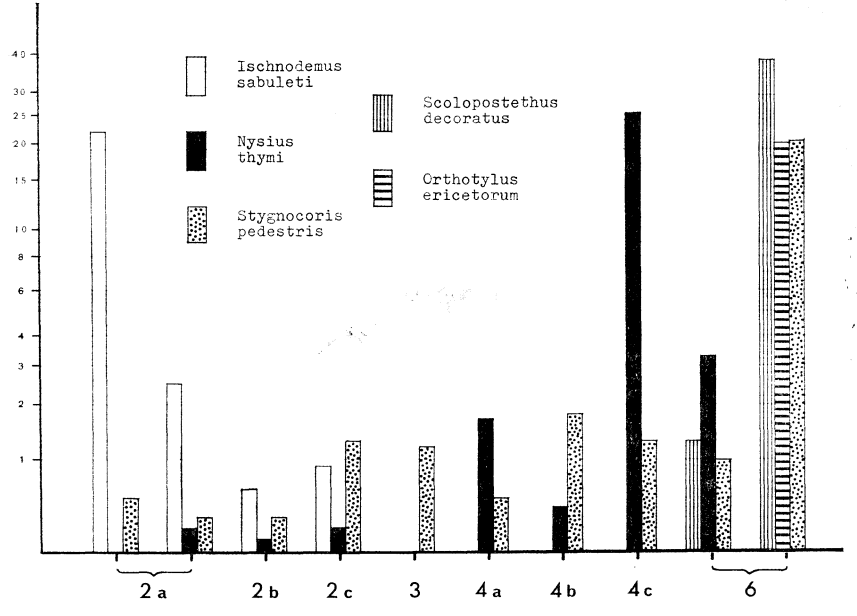

Fig. 8. Horizontal axis: plant communities (cf. p. 33 and Table 2), vertical axis: number of individuals per sample (logarithmic scale!).

the "luxuriant" grey dune. The same applies to *Coranus subapterus,* which seemingly replaces *Stalia major* as a ground-dwelling predator in inland localities. The species last mentioned was exclusively found in the youngest part of the "outer green dune", but by sweeping it was recorded from the "mixed green dune" as well. The other species of nabids were in a few cases caught directly on the earth surface; however, mostly in the lower parts of the vegetation, (e.g. the large number of *Nabis pseudoferus* in the sample No. 58). A number of species *(Rhyparochromus pini, Stygnocoris pedestris, Eremocoris abietis)* undoubtedly have their maximum abundance in the heath, but they are found outside it as well — as opposed to *Scolopostethus decoratus* and *Ischnocoris angustulus.*

8. The variation along the sample lines.

The purpose of this small section is to add some further details to the picture arrived at in the preceding chapter — of the Heteropterous fauna relative to the plant communities.

Each of the diagrams (Figs. 9—11) illustrates the variation of the bug fauna inhabiting the vegetation along one of the three "sample lines" (I, II and III) mentioned p. 28 and figured in Fig. 1. Just as Figs. 7—8, the diagrams comprise the most frequent species and are based on the mean number of individuals per sweep-net sample. Only samples taken in the vicinity of the lines are used, and preferably samples dating from 1963; the four samples from 1965 being included in order to supplement the lines. — The figures do not, of course, pretend to give a true image of the faunal variation along the sample lines; they merely show some marked tendencies.

Sample line I.

This, the northernmost line, is chiefly characterized by traversing the "dune slack grassland" containing the large population of *Nysius thymi,* which is even playing a part in the adjoining communities, especially the dune heath. *Nabis pseudoferus* is remarkably few in number, whereas *N. ericetorum* is frequent — first and foremost in the heath. *Phytocoris varipes,* too, is unusually scarce, while *Polymerus brevicornis* is noteworthy numerous in the samples Nos. 4—5 and is a constant element in samples from adjacent localities. An explanation is offered by the fact

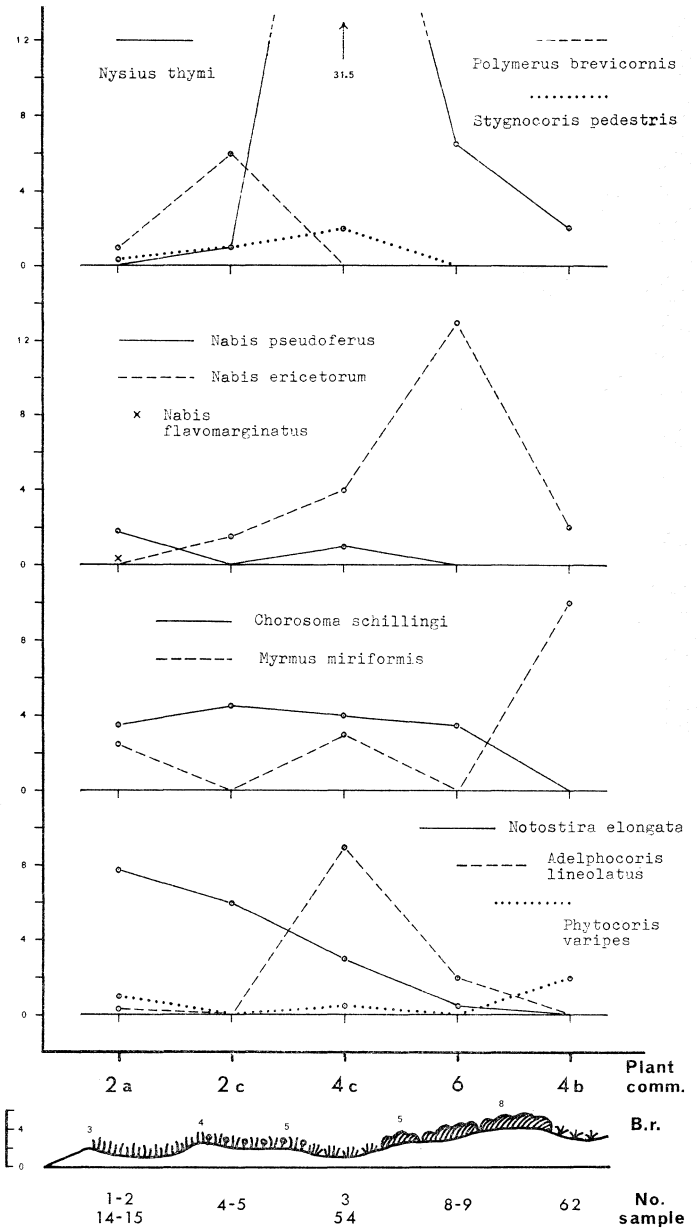

Fig. 9. Sample line I. — Figs. 9—11: The variation in the number of individuals per sample along the three samples lines (cf. Fig. 1). At the base a sketch showing the change of the vegetation along the transect in question. The beach ridges (B.r.) are numbered (cf. Fig. 2). Approximate altitude in metres (small scale on the left). — For an explanation of the figures representing the plant communities, see p. 33 and Table 2.

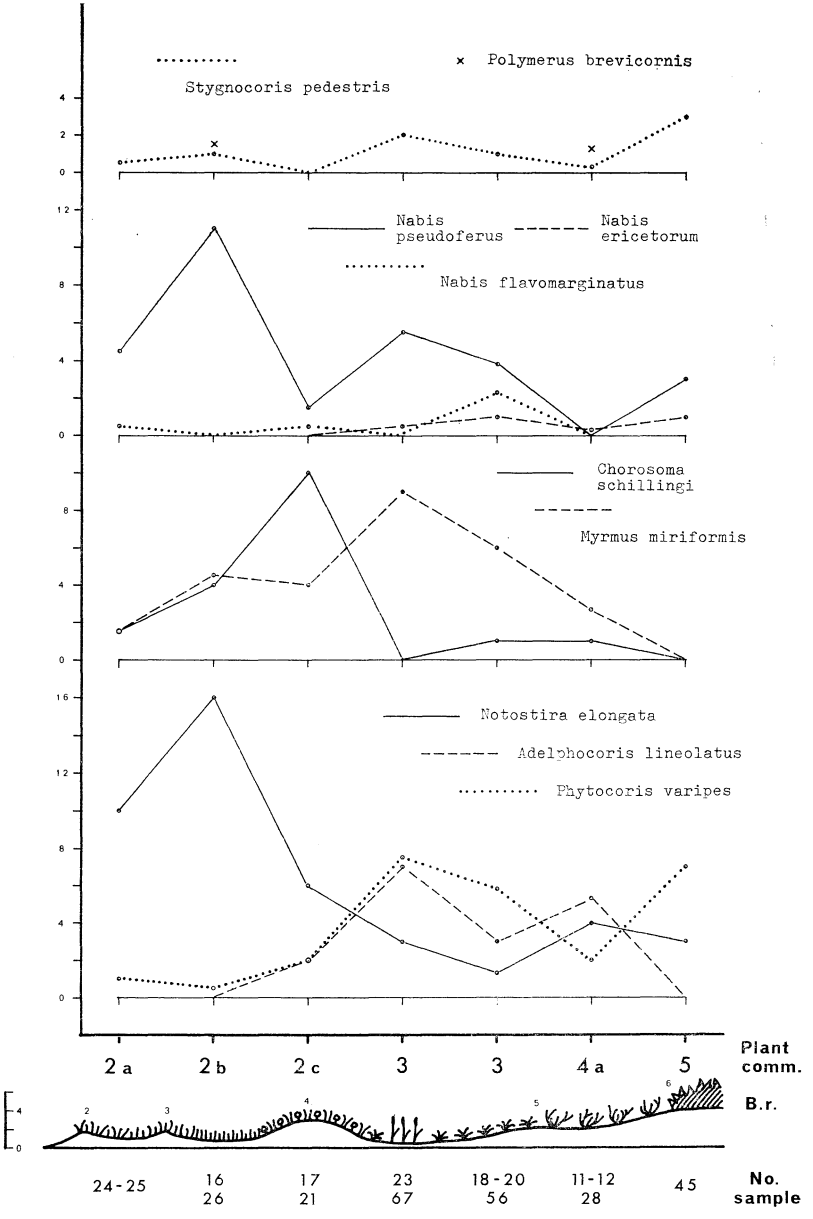

Fig. 10. Sample line II. — See Fig. 9.

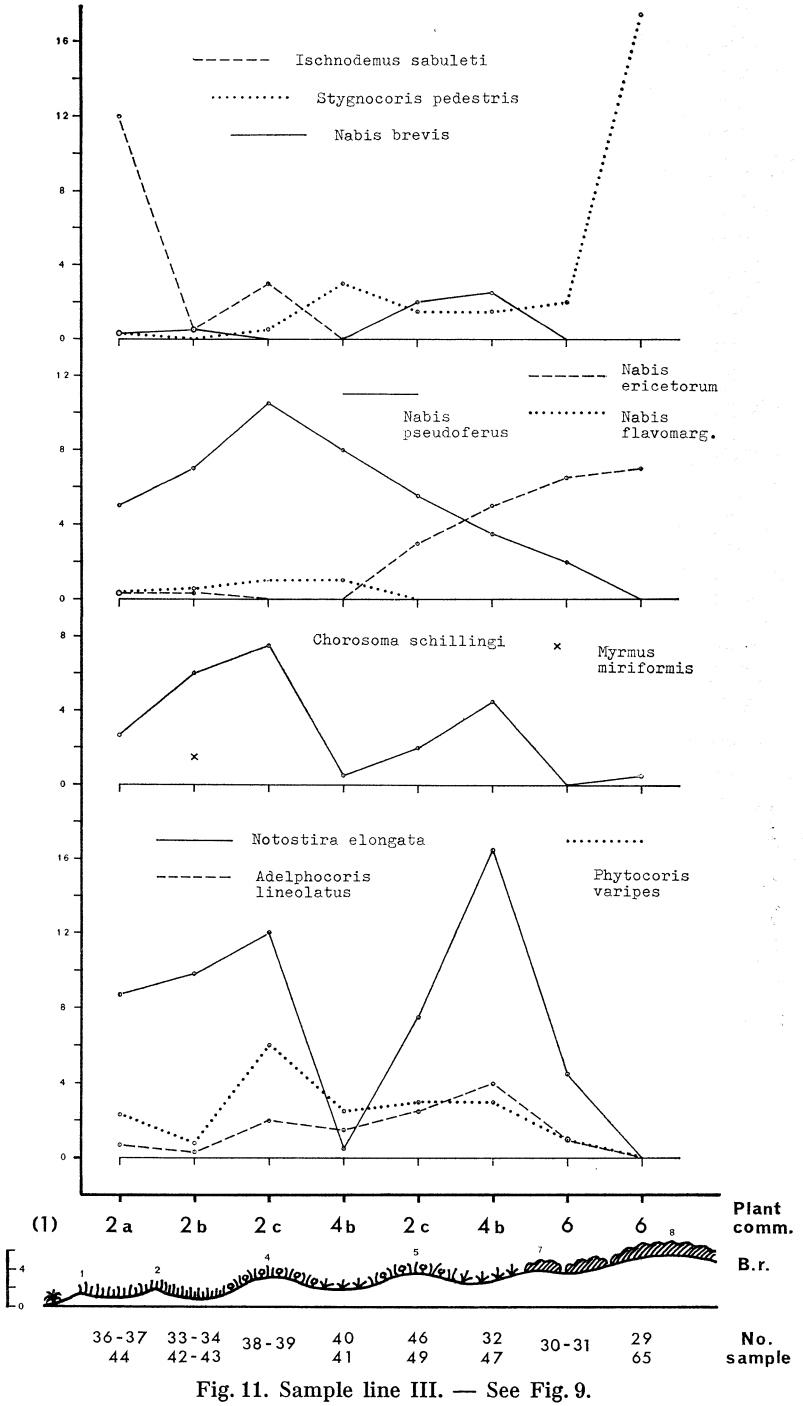

Fig. 11. Sample line III. — See Fig. 9.

that the host plant, *Galium verum* (Wagner 1961), is abundant in the dry area in question.

Sample line II.

This is mainly traversing damp and humid places; no heath localities are included. — As to the two common nabids: here, in sharp contrast to the former line, *Nabis pseudoferus* is predominating, whereas *N. ericetorum* is of no importance. *N. flavomarginatus* and *Myrmus miriformis* are relatively very frequent, both of them having a definite maximum of abundance in the humid localities. This also applies to *Adelphocoris lineolatus* and *Phytocoris varipes* — contrary to *Chorosoma schillingi* and *Notostira elongata* which decidedly prefer the green dune communities.

Sample line III.

The long line in the south is characterized 1) by the youngest "outer green dune", where *Ischnodemus sabuleti* is abundant; 2) by cutting twice the "inner green dune", the two parts of which are separated by sparsely covered and populated Carex grassland-localities (samples Nos. 40 and 41); this provides some of the frequency curves with a double maximum; 3) by traversing both younger and older dune heath.

It appears, that along this line both *Nabis pseudoferus* and *N. ericetorum* are frequent, whereas ideally complementary in distribution. *N. flavomarginatus* is present — few in number — throughout the green dune, while *Myrmus miriformis* is only represented in the "mixed green dune". *Stygnocoris pedestris* is caught along nearly the whole of the line, but it attains a large maximum in the older heath.

Something very peculiar is the occurrence of *Nabis brevis*. This species was on no occasion found north of line III, whereas it was present in most of the sweep-net samples (and in one searching sample) taken on the line or south of it, but only outside the heath. The nearer the southern limit of the area investigated, the more frequent the species: average of the samples Nos. 33—34, 36—37 and 46 on the line is 0.8 specimens per sample — as opposed to 5.7 specimens per sample for the three southernmost samples (Nos. 47, 49 and 50). This is really surprising, because the small area inhabited by the species is apparently indistinguishable from the rest — except in one respect: the position. A tenta-

tive explanation may be proposed, as follows. About one kilometre inland — on the slopes of the Stone Age coast — *Nabis brevis* is by far the commonest nabid, particularly in drier grassland and fallow fields, but even in the old *Calluna*-heath. *N. pseudoferus* has not been found there, and *N. ericetorum* is exceedingly rare. It is therefore believed, that *N. brevis* — preferably an inland-species — has been "caught in the act" of invading the Korshage-area from the south. This is presumably a rather slow process, as the species is brachypterous and unable to fly. *(N. brevis* was not caught by the sweepings in 1965; however, the material is not suitable for a comparison).

Considering as a whole the three figures, the following conclusions may be drawn.

Without doubt *Myrmus miriformis* prefers the fairly damp situations; however, the largest number per sample originates from the "Carex dune grassland" (No. 62, sample line I). As to *Chorosoma schillingi* the diagrams further stress the tendency for it to be "complementary" to *Myrmus*. But this is supposedly caused by the distribution of the host plant, *Ammophila* (cf. p. 47). The three figures clearly show, that where *Nabis pseudoferus* is frequent *N. ericetorum* is infrequent or absent — and vice versa. It has as yet not been possible to suggest a satisfactory explanation of this interesting fact. The remarkable role played by *N. brevis* was considered in detail above. Regarding the three common mirids, *Adelphocoris lineolatus* and *Phytocoris varipes* are declining in frequency towards the extremities of the lines (in the "outer"- and "mixed green dune" and the heath); the maximum is found in the damp, "central" communities, especially on line II (cf. p. 47 concerning *Adelphocoris).* Unlike this, *Notostira elongata* always reaches its peak in the green dune communities and decline in frequency inland (with one exception: the large number obtained in the Carex grassland on line III, samples Nos. 32 and 47).

VI. Heteroptera communities and concluding remarks.

The division of a certain area into plant communities may be carried out in more than one way, and this also applies to the area of Korshage. Nevertheless, even though avoiding difficult and laborious statistical tests, the author claims to have demonstrated a good many differences among the Heteropterous faunas

of the plant communities in question. This seems to show, that on the whole the plant communities dealt with are fairly natural units forming "biocoenotic communities". However, it is obviously hazardous to draw conclusions on the basis of only one suborder of insects in relation to the flora.

But the differences among the bug faunas of the various plant communities are of highly varying magnitude. For example, the faunas of the green dune communities are rather uniform in their general features, whereas greater diversities are encountered when one of these is compared with e.g. the dune heath. It is accordingly tempting to propose a tentative division of the area into what might be called "Heteroptera communities". These coincide with the plant communities, except that the green dune communities (2a, 2b, 2c) and the "Carex dune grassland" (4b) are united to form one large "green dune community", which is considered below. The reasons for this unification appears from the preceding text and Figs. 7—8.

Consequently, the following "bug communities" of the herb stratum[6]) of Korshage are put forward:

A. Beach community.
B. Green dune community.
C. Dune pasture and swamp community.
D. Thalictrum dune grassland community.
E. Dune slack grassland community.
F. Grey dune community.
G. Dune heath community.

Apart from B, these have all been considered and characterized in Section V. The sample No. 62 may indicate a special fauna composition of the uniform *Carex arenaria*-vegetation intermingled in the old heath (cf. p. 43). — Besides B, G is the most extensive and important community of the area. It is believed, that the samples Nos. 65 and 66, which are striking similar, are typical expressions of the older dune heath bug-fauna.

Table 15 shows the composition of the "green dune bug-community" (B). It is based on thirty-two samples; the average num-

[6]) The grey dune is included in spite of the fact that the herb stratum is poorly developed and not investigated. However, the sparse cover causes a special situation (dominance of ground dwellers), which presumably justifies the maintenance of this "community". Otherwise the ground stratum is not regarded in this context because of the insufficient searching material.

ber of individuals per sample is 31.3 ± 14.6. A total of 34 species was found by sweeping. That this value is a reasonable estimate of the real number of species constituting this community is seen, when the cumulative number of species is plotted against the samples (in random order). Only very few additional species are to be expected by continued sweeping.

From the table it appears, that three species are dominant and constant: *Notostira elongata, Nabis pseudoferus* and *Chorosoma schillingi. Ischnodemus sabuleti* is dominant and accessory, whereas *Phytocoris varipes* is influent and constant. These five species are due to their frequency clearly marked out from the rest, and their common frequency is characterizing the community. Another characteristic is the scarcity of some species *(Myrmus miriformis, Nysius thymi, Stygnocoris pedestris, Adelphocoris lineolatus,* etc.) which are common elsewhere in the area.

Among the plant communities of Korshage the mean number of bug-individuals per sample is indeed varying (sweeping: from 20.5 in the "Thalictrum dune grassland" to 86.7 in the older dune heath — searching: from 6 per hour in the "Carex dune grassland" to 76 in the dune heath). However, a single sweeping sample (50 sweeps) and one hours searching on a fallow field less than one kilometre from the point of Korshage (2/9 and 10/9 1965) yielded respectively 383 individuals (26 species) and 101 individuals (16 species). Compared with this the numbers originating from Korshage are low.

But with respect to the number of species Korshage seems to be rich. A total of 90 species of land bugs (presumably more than one fifth of the Danish Geocorisae) has been found in the small area studied (see the next section). This result should be compared with the numbers arrived at by similar, but more extensive investigations of considerably larger areas (e.g. R. Krogerus 1932, Marchand 1953, Schwoerbel 1957, Cmoluchowa 1958, Strawinski 1958, 1959a, 1959b, Andersen and Böcher 1965).

It is further notable that not less than 24 species (27 %) must be considered rare or very rare in Denmark, (cf. next section and the Addendum, p. 62).

Little similarity is apparent when a comparison is made between the Heteropterous fauna of Korshage and the faunas found in other dune areas of northern Europe:

Of the 101 species of Heteroptera listed by R. Krogerus (1932) from the areas of shifting sand on the Finnish coasts, not more than 40 are in common with Korshage, and only one species *(Ischnodemus sabuleti)* is abundant in both places.

Extensive search in the dunes of Terschelling, Holland, (Heerdt and Mörzer Bruyns 1960) revealed 24 species of bugs. Fifteen of these are in common with Korshage, and as a whole there are a good many similarities between the two faunas. However, there are important differences as well, e.g. *Notostira erratica* was present instead of *N. elongata,* and the three species of nabids recorded were *Stalia major, Nabis rugosus* and *N. ferus,* of which *N. ferus* was by far the most frequent. The occurrence of *N. rugosus* in a dune area is — from a Danish viewpoint — most surprising, as the species in Denmark seems to be a wood dweller!

Even when compared with the collections from the large Danish nature reserve, Hansted Reservatet, in northwestern Jutland (Andersen and Böcher 1965) a multitude of dissimilarities could be mentioned — e.g. *Nabis pseudoferus* has not been found in the Hansted reserve. Of the 100 species of land bugs found in Hansted 55 are in common with Korshage, but in the former place collections from some cultivated areas and a coniferous plantation inside the reserve are included.

VII. List of species.

This section lists all the species of Heteroptera found in the area of Korshage studied. Two species (Nos. 3, 14) which were caught before, but not during the periods of investigation, are therefore included.

The systematics and nomenclature are in accordance with Kloet and Hincks (1964). The determinations are based on Jensen-Haarup (1912), Southwood and Leston (1959) and Wagner (1961).

For each species references are given to pages, figures and tables in the preceding text (excluding the sweeping-tables in connection with the different plant communities). The total number of specimens caught ("ex.") is only mentioned when it is less than ten. In some cases the "bug communities" (A—G, p. 56) to which the species preferentially belongs is stated.

It appears from the tables, that only an insignificant part of the material is constituted by unidentifiable immature stages. In the

list is given the percentage of the catch that is made up by nymphs ("juv.").

Unfortunately, it is as yet not possible to say very much for certain about the distribution and frequency of the land bug species in Denmark; the last published fauna list (Jensen-Haarup 1912) is out of date. Regarding some of the species, tentative information is to be found in Andersen and Böcher (1965). In the following list it is merely noted, when a species must — at present — be considered rare in Denmark. — Five species have not previously been recorded from Denmark: *Eurygaster testudinaria* (Geoffr.), *Ceraleptus lividus* Stein., *Ischnocoris angustulus* (Boh.), *Lygus maritimus* Wagn., *Polymerus palustris* (Reut.).

CYDNIDAE:

1. *Legnotus picipes* (Fall.)
   Table 3 — 3 ex. (2 juv.) — (B).

SCUTELLERIDAE:

2. *Eurygaster testudinaria* (Geoffr.)
   P. 42, 59. Table 3 — 2 ex. — (C).

PENTATOMIDAE:

3. *Podops inuncta* (F.)
   1 ex. dating from June 1962. — Rare.
4. *Sciocoris cursitans* (F.)
   P. 44. Tables 3, 5 — 17 % juv. — (F).
5. *Aelia acuminata* (L.)
   P. 39. Tables 3, 5 — 20 % juv. — B.
6. *Pitedia juniperina* (L.)
   P. 46. Tables 3, 5 — 4 ex. — G.
   The species was not found on *Juniperus,* but elsewhere in the dune heath where *Empetrum nigrum* is supposed to be the host plant (cf. Wagner 1966).
7. *Dolycoris baccarum* (L.)
   Table 3 — 6 ex.
8. *Picromerus bidens* (L.)
   P. 42. Table 3 — 3 ex.

COREIDAE:

9. *Ceraleptus lividus* Stein
   P. 43, 59. Table 5 — 1 ex. — Rare.
   The single specimen found is a fifth-instar nymph, and the determination may be doubtful.

ALYDIDAE:

10. *Alydus calcaratus* (L.)
    P. 38, 44, 45, 49. Tables 3, 5 — (F).

RHOPALIDAE:

11. *Rhopalus parumpunctatus* Schill.
    Table 3 — 1 ex.
12. *Myrmus miriformis* (Fall.)
    P. 37, 40—43, 47, 54, 55, 57. Figs. 7, 9—11. Table 3 — C.
13. *Chorosoma schillingi* (Schum.)
    P. 37, 40—45, 47, 49, 54, 55, 57. Figs. 7, 9—11.
    Tables 3, 5 — B.

LYGAEIDAE:

14. *Heterogaster urticae* (F.)
1 ex. dating from June 1962.
15. *Geocoris grylloides* (L.)
P. 38, 44, 45, 49. Tables 3, 5 — (F).
16. *Ischnodemus sabuleti* (Fall.)
P. 37—41, 54, 57, 58. Figs. 8, 11. Tables 3, 5 — B.
About 20 % nymphs in the sweep-net samples (1963) and at least 50 % juv. in the searchings (1965).
17. *Nysius thymi* (Wff.)
P. 37, 42—44, 50, 57. Figs. 8, 9. Tables 3, 5 — E.
18. *Nysius helveticus* (H.S.)
P. 46. Table 3 — 6 ex. — G.
19. *Ortholomus punctipennis* (H.S.)
P. 42, 43. Table 3 — 7 ex. — D — Rare.
20. *Rhyparachromus pini* (L.)
P. 38, 41, 44—47, 50. Tables 3, 5 — 15 % juv. — G.
21. *Trapezonotus arenarius* (L.)
Table 5 — 1 ex.
22. *Macrodema micropterum* (Curt.)
P. 44, 46. Tables 3, 5 — G.
23. *Pionosomus varius* (Wff.)
P. 41, 44. Tables 4, 5 — 18 % juv. — Rare.
24. *Stygnocoris fuligineus* (Geoffr.)
Table 3 — 1 ex.
25. *Stygnocoris pedestris* (Fall.)
P. 37—39, 41, 43—46, 50, 54, 57. Figs. 8—11. Tables 3—5 — 5 % juv. — G.
26. *Plinthisus pusillus* (Sz.)
P. 38, 41, 44. Tables 3, 5 — Rare.
27. *Ischnocoris angustulus* (Boh.)
P. 46, 50, 59. Table 5 — G — Rare.
28. *Scolopostethus decoratus* (Hahn)
P. 37, 38, 45—47, 50. Fig. 8. Tables 3, 5 — 53 % juv. — G.
29. *Eremocoris abietis* (L.)
P. 38. 44, 46, 47, 50. Table 5 — 25 % juv. — G.

BERYTINIDAE:

30. *Cymus glandicolor* Hahn
Table 3 — 7 % juv.

PIESMATIDAE:

31. *Piesma quadratum* (Fieb.)
P. 39, 40. Tables 3, 5 — A.

TINGIDAE:

32. *Acalypta nigrina* (Fall.)
Tables 3, 5 — 4 ex. — Rare.
33. *Acalypta parvula* (Fall.)
P. 38, 44. Tables 4, 5 — 7 % juv. — Rare (?).

REDUVIIDAE:

34. *Coranus subapterus* (De G.)
P. 38, 41, 44, 45, 50. Table 5 — F.

NABIDAE:

35. *Nabis flavomarginatus* Sz.
P. 37, 42, 47, 54. Figs. 7, 9—11. Table 3 — B.
One macropterous male.
36. *Nabis ferus* (L.)
P. 58. Table 3 — 2 ex.

37. *Nabis pseudoferus* Rem.
P. 37, 38, 40, 41, 43—45, 47, 49, 50, 54, 55, 57, 58. Figs. 7, 9—11. Tables 3, 5 — B.
About 10 % juv. in 1963, considerably more (57 %) in the 1965-material.
38. *Nabis brevis* Sz.
P. 54, 55. Fig. 11. Tables 3, 5.
39. *Nabis ericetorum* Sz.
P. 37, 39, 41, 43—47, 50, 54, 55. Figs. 7, 9—11. Tables 3, 5 — G.
About 12 % juv. in 1963, considerably more (48 %) in the 1965-material.
40. *Stalia major* (Costa)
P. 50, 58. Tables 3, 5 — B. (See Leth 1962, Andersen and Böcher 1965).

CIMICIDAE:

41. *Anthocoris nemoralis* (F.)
P. 39, 42, 45.
42. *Anthocoris nemorum* (L.)
P. 39, 42 — Very few juv.
43. *Orius niger* (Wff.)
Table 3 — 7 ex. (1 juv.).

MIRIDAE:

44. *Megalocoleus molliculus* (Fall.)
P. 42. Table 3 — C.
45. *Plagiognathus chrysanthemi* (Wff.)
P. 41, 42. Table 3 — C.
46. *Pilophorus perplexus* Dgl. Sc.
P. 45 — 4 ex. — Rare.
47. *Globiceps fulvicollis cruciatus* Reut.
P. 43. Tables 3, 5 — 5 ex.
48. *Orthotylus ericetorum* (Fall.)
P. 45, 46. Fig. 8. Table 3 — 17 % juv. — G.
49. *Orthotylus virescens* (Dgl. Sc.)
P. 45.
50. *Orthotylus flavosparsus* (Shlbg.)
P. 39, 40. Tables 3, 5 — A.
51. *Lygus maritimus* Wagn.
P. 39, 40, 45, 59. Table 3 — A.
About 50 % juv. — *Atriplex* spp. in the beach community undoubtedly are the primary host plants, from which migration takes place so the species is found throughout the area.
52. *Lygus pratensis* (L.)
P. 39. Tables 3, 5 — (C).
53. *Lygus rugulipennis* Popp.
P. 39. Table 3 — 2 ex.
54. *Orthops cervinus* (H.S.)
P. 39 — A — Rare.
The occurence on *Atriplex* spp. is strange; otherwise the species is only recorded from various deciduous trees (Southwood and Leston 1959).
55. *Orthops kalmi* (L.)
P. 42. Table 3.
56. *Polymerus palustris* (Reut.)
P. 42, 59. Table 3 — 1 ex. — (C) — Rare.
57. *Polymerus unifasciatus* (F.)
Table 3 — 1 ex.
This species is otherwise (in Denmark) the commonest of the genus; at Korshage it is apparently replaced by *P. brevicornis*.

58. *Polymerus vulneratus* (Wff.)
P. 43. Table 3 — 2 ex. — (D) — Rare.
59. *Polymerus brevicornis* (Reut.)
P. 41—43, 50. Figs. 9, 10. Tables 3, 5 — Rare.
60. *Charagochilus gyllenhali* (Fall.)
P. 47. Table 3 — 2 ex.
61. *Calocoris norvegicus* (Gmel.)
P. 39. Table 3 — 3 ex.
62. *Adelphocoris lineolatus* (Gz.)
P. 37, 40—44, 47, 54, 55, 57. Figs. 7, 9—11. Table 3 — 30 % juv. — C, D.
63. *Adelphocoris seticornis* (F.)
P. 42. Table 3 — 7 ex. — C.
64. *Phytocoris varipes* Boh.
P. 37, 40—43, 45, 49, 50, 54, 55, 57. Figs. 7, 9—11. Tables 3, 5 — (1 juv.).
65. *Stenodema laevigatum* (L.)
Tables 3, 5 — 2 ex.
66. *Stenodema virens* (L.)
Table 3 — 1 ex.
It is astonishing that only three specimens of these elsewhere so abundant grass-mirids were caught; the "niche" is perhaps occupied by *Notostira elongata?*
67. *Notostira elongata* (Geoffr.)
P. 37, 40—43, 49, 54, 55, 57, 58. Figs. 7, 9—11. Tables 3, 5 — (B).
45 % juv. in 1963, 67 % in the 1965-material. — (See Andersen and Böcher 1965).

Addendum.

During the summer of 1966 the July-aspect of the Heteropterous fauna of Korshage was studied and compared with that of the late summer. Besides finding some striking dissimilarities concerning the relative frequency among the species already known from the area, no less than 23 additional species were found:

SCUTELLERIDAE: *Odontoscelis dorsalis* (F.) (Rare)
PENTATOMIDAE: *Eurydema oleracea* (L.)
Rhacognathus punctatus (L.)
LYGAEIDAE: *Peritrechus nubilus* (Fall.) (Rare)
Stygnocoris rusticus (Fall.)
BERYTINIDAE: *Berytinus crassipes* (H.S.)
PIESMATIDAE: *Piesma capitatum* (Wff.)
TINGIDAE: *Derephysia foliacea* (Fall.) (Rare?)
REDUVIIDAE: *Empicoris vagabundus* (L.)
MIRIDAE: *Lopus decolor* (Fall.)
Tytthus pygmaeus (Zett.) (Rare)
Plagiognathus sp. (*albipennis* group)
Monosynamma bohemani (Fall.) (Rare?)
Monosynamma nigritula (Zett.) (Rare?)
Srongylocoris leucocephalus (L.)

Orthocephalus coriaceus (F.)
Orthocephalus saltator (Hahn) (Rare)
Pithanus maerkeli (H.S.)
Capsus ater (L.)
Stenodema calcaratum (Fall.)
Trigonotylus ruficornis (Geoffr. in Fourcr.) (Rare?)
Teratocoris antennatus (Boh.)
Leptopterna dolabrata (L.)

Two of these are new to the Danish fauna, namely *Tytthus pygmaeus* (Zett.) and *Plagiognathus* sp.

Calocoris roseomaculatus (DeG.) was found just outside the area investigated.

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Summary.

During 1963 and 1965 the late summer Heteropterous fauna was studied in a dune and heath area of northwestern Zealand. A small territory containing a fairly well defined succession of plant communities was selected. Here the species composition, its relationship to plant communities, and the variation in relative numbers within the various communities were investigated by use of sweeping samples supplemented by searching and sifting.

Dissimilarities of varying magnitude were found when the bug faunas of the different plant communities were compared. In conclusion, a number of tentative "Heteroptera communities" are proposed, the most prominent of which are those associated with the "green dune" and "dune heath" plant communities. The dominant Heteropterans associated with the "green dune" communities were *Notostira elongata* (Geoffr.), *Nabis pseudoferus* Rem., *Chorosoma schillingi* (Schum.), *Ischnodemus sabuleti* (Fall.), and *Phytocoris varipes* Boh., whereas the dominant bugs of the "dune heath" community were *Scolopostethus decoratus* (Hahn), *Stygnocoris pedestris* (Fall.), *Nabis ericetorum* Sz., and *Orthotylus ericetorum* (Fall.). Important species of other plant communities were *Alydus calcaratus* (L.), *Myrmus miriformis* (Fall.), *Nysius thymi* (Wff.), *Lygus maritimus* Wagn., and *Adelphocoris lineolatus* (Gz.). Special attention was paid to the relative distribution of the *Nabis* spp.

A total of 90 species was found in the study area. This includes a number of forms collected in July 1966 which apparently represent a distinct mid-summer fauna. Many species are, at present, considered rare in Denmark.

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Table 1. — Time of collections, weather conditions, etc.

Sample No.	Date	Time of day	Method	Plant community	Air temp.(°C)	Sun	Wind
	1963:						
1—2	14 Aug.	14.30	Sw	2a	19°	ooo	××
3	17 Aug.	10	Sw	4c	19°	ooo	×
4—5	17 Aug.	11	Sw	2c	19°	oo	×
6—7	17 Aug.	14.30	Sw	4a	19°	oo	××
8—9	19 Aug.	14	Sw	6	20°	o	××
10	19 Aug.	14	Se	2c	20°	o	××
11—12	19 Aug.	15	Sw	4a	19°	o	××
13	21 Aug.	12	Se	2c	18°	oo	××
14—15	21 Aug.	13.15	Sw	2a	18°	oo	××
16	21 Aug.	13.45	Sw	2b	18°	oo	××
17	21 Aug.	14.15	Sw	2c	18°	•	×××
18—20	22 Aug.	14.15	Sw	3	18°	ooo	××
21	22 Aug.	15.45	Sw	2c	17°	ooo	××
22	22 Aug.	16.15	Si	2c	18°	ooo	×
23	23 Aug.	13.45	Sw	3	19°	ooo	0
24—25	23 Aug.	14.30	Sw	2a	19°	ooo	0
26	23 Aug.	15.15	Sw	2b	19°	ooo	0
27	23 Aug.	16	Si	2c	18°	ooo	0
28	24 Aug.	12	Sw	4a	19°	oo	××
29	26 Aug.	13.30	Sw	6	19°	ooo	×××
30—31	26 Aug.	14.15	Sw	6	19°	ooo	×××
32	26 Aug.	14.45	Sw	4b	19°	ooo	×××
33—34	27 Aug.	11	Sw	2b	18°	•	×××
35	28 Aug.	10	Sw	2c	17°	•	×
36—37	28 Aug.	13.30	Sw	2a	18°	o	×
38—39	30 Aug.	14.30	Sw	2c	17°	ooo	×
40	30 Aug.	15.30	Sw	4b	17°	ooo	×
41	31 Aug.	11	Sw	4b	16°	oo	×
42—43	31 Aug.	11.30, 14.30	Sw	2b	17°	oo	×
44	31 Aug.	15.30	Sw	2a	17°	•	×
45	3 Sept.	10.30	Sw	5	18°	ooo	××
46	5 Sept.	14	Sw	2c	17°	o	×
47	6 Sept.	15.30	Sw	4b	18°	oo	×
48	7 Sept.	11.15	Se	6	19°	ooo	×
49	7 Sept.	12.30	Sw	2c	19°	ooo	×
50	7 Sept.	13	Sw	2a	19°	ooo	×
51	7 Sept.	15.30	Si	4d	18°	ooo	×

P. T. O.

Table 1 continued.

Sample No.	Date	Time of day	Method	Plant community	Air temp.(°C)	Sun	Wind
	1965:						
52	24 Aug.	14.30	Sw	2b	21°	o	××
53	24 Aug.	15.30	Sw	2b	20°	•	××
54	28 Aug.	13.30	Sw	4c	18°	ooo	××
55	28 Aug.	14.15	Sw	4c	18°	ooo	××
56	28 Aug.	15.15	Sw	3	18°	ooo	××
57	4 Sept.	11	Se	2a	18°	ooo	×
58	4 Sept.	15.30	Se	2a	17°	•	×
59	5 Sept.	14.15	Sw	2c	18°	oo	0
60	5 Sept.	14.45	Sw	4a	18°	oo	0
61	6 Sept.	14	Se	4d	19°	oo	0
62	6 Sept.	15.30	Sw	4b	19°	oo	0
63	8 Sept.	15	Se	4b	15°	o	×××
64	9 Sept.	15	Se	1	15°	•	××
65	10 Sept.	15.15	Sw	6	16°	ooo	0
66	10 Sept.	16	Sw	6	15°	ooo	0
67	11 Sept.	10.30	Sw	3	18°	oo	×
68	11 Sept.	11.30	Se	4d	18°	oo	×
69	23 Sept.	12	Si	4d	17°	oo	×
70	24 Sept.	11, 14.30	Si	4b	19°	ooo	0
71	25 Sept.	11	Se	4d	19°	oo	×
72	29 Sept.	14	Se	4d	15°	o	×
73	29 Sept.	15	Si	4d	16°	ooo	0

Column 3. The time given is that of the start of sampling.

Column 4. Se = searching, Si = sifting, Sw = sweeping.

Column 5. The number given refer to the plant communities, see p. 33 and Table 2.

Column 6. Measurements in shade, 1.5 m above ground level.

Column 7. Signatures: ooo = bright sunshine, oo = hazy sunshine, o = cloudy sunshine, • = overcast.

Column 8. Force of the wind is given as relative estimates: 0 = calm, × = light breeze, ×× = moderate breeze, ××× = stronger wind (making sweeping rather more difficult).

Table 2. — Plant communities investigated.

Community and Nos. of samples.	Vegetation. !! and ! indicate more or less dominating species, species in brackets are less frequent. Mosses and lichens are only exceptionally included.
1. Beach.	
64, etc.	Atriplex litoralis!! Atriplex hastata, Atriplex patula — Elymus arenarius, Honckenya peploides, Cakile maritima, Crambe maritima, Matricaria maritima, Senecio viscosus.
2. Green dune.	
a. Outer green dune.	
1—2, 14—15, 58:	Ammophila arenaria!! Festuca rubra! Thalictrum minus, Lathyrus maritimus, Galium verum, Achillea millefolium. Hieracium umbellatum, (Rosa rugosa).
24—25:	Ammophila arenaria!! Festuca rubra! Polypodium vulgare, Corynephorus canescens, Pulsatilla pratensis, Thalictrum minus, Sedum acre, Lathyrus maritimus, Jasione montana, Achillea millefolium, Hieracium umbellatum.
36—37, 44, 50, 57:	Ammophila arenaria!! Festuca rubra! Lathyrus maritimus! Hieracium umbellatum! Elymus arenarius, Atriplex hastata, Atriplex litoralis, Thalictrum minus, Cakile maritima, Artemisia campestris, (Phragmites communis, Rumex thyrsiflorus, Achillea millefolium).
b. Mixed green dune.	
16, 36, 42—43:	Agropyrum repens! Festuca rubra! Lathyrus maritimus! Ammophila arenaria, Thalictrum minus, Galium verum, Achillea millefolium, Artemisia campestris, (Elymus arenarius, Rumex thyrsiflorus, Rosa rugosa).
33—34, 52:	Festuca rubra! Carex arenaria! Achillea millefolium! Ammophila arenaria, Thalictrum minus, Pimpinella saxifraga, Campanula rotundifolia, Jasione montana, Artemisia campestris, (Rosa rugosa).
53:	Festuca rubra! Thalictrum minus! Rhinantus minor! Hieracium umbellatum! Ammophila arenaria, Elymus arenarius, Galium verum, Jasione montana, Achillea millefolium, Artemisia campestris.
c. Inner green dune.	
4—5, 17, 21, 35, 38—39, 46, 49, 59:	Ammophila arenaria!! Polypodium vulgare (+ Dicranum scoparium)! Deschampsia flexuosa! Carex arenaria! Festuca rubra, Pulsatilla pratensis, Thalictrum minus, Pimpinella saxifraga, Rhinanthus minor, Galium verum, Campanula rotundifolia, Hieracium umbellatum, (Corynephorus canescens, Rubus idaeus, Lathyrus maritimus, Chamaenerium angustifolium, Thymus serpyllum, Jasione montana, Achillea millefolium, Solidago virga-aurea).
10, 13, 22, 27:	Cladina-Cornicularia aculeata! Corynephorus canescens! Hieracium umbellatum! Dicranum scoparium, Ammophila arenaria, Deschampsia flexuosa, Empetrum nigrum, Thymus serpyllum, Galium verum.

Table 2 continued.

3. Dune pasture and swamp.
   - 18—19—20, 56: Vicia cracca!! Potentilla anserina! Pimpinella saxifraga! Achillea millefolium! Agropyrum repens, Agrostis tenuis, Festuca rubra, Holcus lanatus, Thalictrum minus, Geranium sanguineum, Potentilla reptans, Hieracium umbellatum, (Salix cinerea, Salix repens).
   - 23: Scirpus tabernaemontani! Lythrum salicaria! Heleocharis palustris, Carex nigra, Typha latifolia, Juncus compressus, Galium palustre.
   - 67: Holcus lanatus! Potentilla anserina! Vicia cracca! Lythrum salicaria! Festuca rubra, Scirpus tabernaemontani, Carex nigra, Ranunculus acer, Potentilla erecta, Achillea millefolium.

4. Dune grassland.
   a. Thalictrum dune grassland.
   - 6—7, 11—12, 28, 60: Thalictrum minus!! Pimpinella saxifraga! Achillea millefolium! Anthoxanthum odoratum, Deschampsia flexuosa, Festuca rubra, Carex arenaria, Potentilla reptans, Lotus corniculatus, Geranium sanguineum, Armeria maritima, Galium verum, Campanula rotundifolia, Artemisia campestris, Hieracium umbellatum, (Ammophila arenaria, Silene nutans, Pulsatilla pratensis, Trifolium arvense, Plantago lanceolata).

   b. Carex dune grassland.
   - 32, 40, 47, 62: Carex arenaria!! Pimpinella saxifraga! Deschampsia flexuosa, Pulsatilla pratensis, Thalictrum minus, Galium verum, Campanula rotundifolia, Hieracium umbellatum, (Agrostis tenuis, Festuca rubra, Rumex acetosella, Potentilla reptans, Lotus corniculatus, Trifolium arvense, Geranium sanguineum, Armeria maritima, Jasione montana, Achillea millefolium).
   - 41, 63, 70: Carex arenaria! Hieracium umbellatum! Cladina, Corynephorus canescens, Luzula campestris, Thalictrum minus, Sedum acre, Pimpinella saxifraga, Thymus serpyllum, Galium verum, Campanula rotundifolia, Hieracium pilosella.

   c. Dune slack grassland.
   - 3, 54: Agrostis tenuis! Festuca rubra! Anthoxanthum odoratum, Festuca ovina, Thalictrum minus, Potentilla reptans, Lathyrus montanus, Lotus corniculatus, Trifolium repens, Pimpinella saxifraga, Armeria maritima, Plantago lanceolata, Campanula rotundifolia, Achillea millefolium.
   - 55: Potentilla anserina! Plantago maritima! Festuca rubra, Holcus lanatus, Carex nigra, Trifolium pratense, Lotus corniculatus, Plantago lanceolata.

   d. Grey dune.
   - 68, 69, 71, 72: Cladina! Mosses! (Dicranum polysetum, Dicranum scoparium, Hypnum cupressiforme), Corynephorus canescens! Festuca ovina! Carex arenaria! Thymus serpyllum! Hieracium pilosella! Polypodium vulgare, Ammophila arenaria, Anthoxanthum odoratum, Deschampsia flexuosa, Festuca rubra, Luzula campestris, Rumex acetosella, Pulsatilla pratensis, Thalictrum minus, Sedum acre, Potentilla reptans, Trifolium arvense, Viola canina, Pimpinella saxifraga, Galium verum, Jasione montana, Achillea millefolium, Artemisia campestris, Hieracium umbellatum, Gnaphalium arenarium.
   - 51, 61, 73: Cladina!! Mosses!! (Dicranum scoparium, Hypnum cupressiforme, Rhacomitrium canescens), Corynephorus canescens! Thymus serpyllum! Festuca ovina, Carex arenaria, Thalictrum minus, Plantago maritima, Galium verum, Jasione montana, Artemisia campestris, Hieracium pilosella, Hieracium umbellatum, (Pulsatilla pratensis, Geranium sanguineum).

Table 2 continued.

5. Dune scrub.	
45, etc.	Ulex europaeus!! Rubus fruticosus! Rubus ideaeus, Juniperus communis, Deschampsia flexuosa, Betula verrucosa, Quercus robur, Rosa canina, Sorbus aucuparia, Sarothamnus scoparius, Chamaenerium angustifolium, Lonicera periclymenum.
6. Dune heath.	
8—9:	Empetrum nigrum! Calluna vulgaris! Cladina, Ammophila arenaria, Corynephorus canescens, Thymus serpyllum, Galium verum, Hieracium umbellatum.
29:	Calluna vulgaris!!
30—31:	Calluna vulgaris!! Carex arenaria! Pulsatilla pratensis, Geranium sanguineum, Empetrum nigrum, Rubus idaeus, Pimpinella saxifraga, Veronica chamaedrys.
48:	Empetrum nigrum, Calluna vulgaris.
65—66:	Calluna vulgaris!! Empetrum nigrum! Juniperus communis, Deschampsia flexuosa, Salix repens, Vaccinium uliginosum.

Table 3. — Survey of the Heteroptera caught i quantitative sweeping samples.

Plant community:	2a. Outer green dune						2b. Mixed green dune						2c. Inner green dune								3. Dune pasture and swamp				4a. Thalictrum dune grassland				4b. Carex dune grassland					4c. Dune slack grassland			5. Dune scrub	6. Dune heath					Number of individuals caught	Percentage of total	Occuring in % of samples
Sample No.:	36-37	44	50	1-2	14-15	24-25	16	26	33-34	42-43	52	53	4-5	17	21	35	38-39	46	49	59	18-19 20	23	56	67	6-7	11-12	28	60	32	40	41	47	62	3	54	55	45	8-9	30-31	29	65	66			
Legnotus picipes	—	—	—	1	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	0.2	5.3
Eurygaster testudinaria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0 +	0.0	0
Sciocoris cursitans	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 +	0.1	1.8
Aelia acuminata	+	—	2	—	—	—	—	—	2	+	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6 +	0.3	7.0
Pitedia juniperina	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	0.1	1.8
Dolycoris baccarum	—	—	—	—	—	—	—	—	—	+	—	—	—	—	1	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	1	—	—	4 +	0.2	5.3
Picromerus bidens	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	0.1	1.8
Alydus calcaratus	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	2	—	—	—	—	1	—	5	—	—	9 +	0.5	8.9
Rhopalus parumpunctatus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0 +	0.0	0
Myrmus miriformis	—	—	—	4	1	3	4	5	2	4	2	1	—	—	8	1	—	—	—	—	18	—	6	18	3	6	2	1	—	—	—	—	10	3	3	—	—	—	—	—	—	105	5.5 I	46.4 Acs
Chorosoma schillingi	4	4	2	5	9	3	3	5	19	5	3	7	9	16	4	2	15	3	1	4	4	—	—	—	5	3	—	2	7	1	—	2	+	3	5	1	—	7	—	1	—	—	164 +	8.6 I	75 C
Geocoris grylloides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	0.1	1.8
Ischnodemus sabuleti	23	13	52	4	1	10	—	3	—	2	—	—	—	—	—	—	6	—	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	117	6.1 I	26.8 Acs
Nysius thymi	+	—	—	—	—	1	—	—	—	—	—	1	2	—	—	—	—	—	—	—	—	—	—	—	2	8	—	—	—	—	—	2	37	26	13	—	13	—	—	—	—	105 +	5.5 I	21.4
Nysius helveticus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	2	6	0.3	3.6
Ortholomus punctipennis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	2	3	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	7	0.4	7.0
Rhyparochromus pini	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	0.1	1.8
Macrodema micropterum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	2	1	4	0.2	5.3
Stygnocoris fuligineus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0 +	0.0	0
Stygnocoris pedestris	—	1	1	1	—	1	1	1	+	—	—	—	2	—	—	7	1	1	2	—	3	2	—	2	—	—	1	2	2	1	5	1	—	4	—	—	3	—	4	10	25	26	110 +	5.8 I	50 Acs
Scolopostethus decoratus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—	—	46	68	119	6.2 I	5.3
Cymus glandicolor	—	—	—	—	—	—	—	1	—	—	8	—	1	—	—	—	+	—	—	—	—	—	—	—	1	—	—	—	—	—	—	+	+	—	—	—	—	—	—	—	—	11 +	0.6	7.0
Piesma quadratum	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	0.2	3.6
Acalypta nigrina	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	2	0.1	3.6
Nabis flavomarginatus	1	—	1	—	1	1	—	—	1	1	2	—	—	—	1	—	2	—	—	4	6	—	3	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	26	1.4	26.8 Acs
Nabis ferus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 +	0.1	1.8
Nabis pseudoferus	11	4	3	1	6	9	6	16	3	25	1	—	—	3	—	4	21	7	4	—	8	—	7	11	—	—	—	—	3	13	3	4	—	—	2	—	3	—	4	—	—	182	10.5 D	60.8 C
Nabis brevis	1	—	9	—	—	—	—	—	2	—	—	—	—	—	—	—	—	1	3	—	—	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	21	1.1	10.7
Nabis ericetorum	1	—	—	—	—	—	—	—	—	1	2	—	3	—	—	2	—	2	4	—	3	—	1	1	—	1	—	1	6	—	—	4	2	5	3	—	1	26	13	9	5	3	99	5.2 I	44.6 Acs
Stalia major	—	—	—	—	—	—	—	—	+	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 +	0.1	1.8
Nabidae spp. (juv.)	—	—	1	1	—	1	1	2	—	—	—	—	—	1	—	1	—	—	—	—	1	—	—	—	1	—	+	—	—	—	—	—	—	—	—	1	—	—	—	—	—	11 +	0.6	—
Orius niger	—	—	—	+	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1 +	0.1	1.8
Megalocoleus molliculus	—	—	—	—	—	—	—	—	—	—	—	1	+	—	1	—	—	—	—	—	1	—	12	—	3	—	1	2	—	—	—	—	—	—	4	—	—	1	—	—	—	—	26 +	1.4	16.1
Plagiognathus chrysanthemi	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	1	27	1	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	35	1.8	10.7
Globiceps fulvicollis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	3	0.2	5.3
Orthotylus ericetorum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	38	22	60	3.2	3.6
Orthotylus flavosparsus	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	0.1	1.8
Lygus maritimus	+	4	1	—	—	—	—	—	—	—	—	—	+	—	—	—	+	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	1	—	1	1	—	12 +	0.6	14.3
Lygus pratensis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	2	1	1	+	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	6 +	0.3	8.9
Lygus rugulipennis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0 +	0.0	0
Orthops kalmi	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	1	4	—	—	1	—	1	—	—	+	—	1	—	—	—	—	—	13 +	0.7	10.7
Polymerus palustris	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0 +	0.0	0
Polymerus unifasciatus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	0.1	1.8
Polymerus vulneratus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	2	0.1	3.6
Polymerus brevicornis	—	—	—	2	2	—	1	2	—	1	—	—	12	—	—	—	—	—	—	—	—	—	—	—	8	4	—	—	—	—	—	—	+	—	—	—	—	2	—	—	—	34 +	1.8	21.4
Charagochilus gyllenhali	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0 +	0.0	0
Calocoris norvegicus	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	0.1	1.8
Adelphocoris lineolatus	2	—	—	+	1	—	—	—	1	+	—	1	+	—	4	5	4	—	5	—	9	13	3	1	6	10	6	2	8	2	1	—	—	11	7	—	—	4	2	—	—	+	108 +	5.7 I	51.8 C
Adelphocoris seticornis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	0.3	7.0
Phytocoris varipes	6	1	4	1	3	2	1	—	2	1	11	7	—	—	4	13	12	4	2	5	4	3	19	12	1	5	1	3	4	5	—	2	2	+	1	—	7	—	2	—	—	150 +	7.9 I	64.3 C
Stenodema laevigatum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	0.1	1.8
Stenodema virens	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0 +	0.0	0
Notostira elongata	17	9	5	14	17	20	13	19	11	28	4	2	12	8	4	8	24	11	4	2	4	—	1	6	3	9	3	—	8	1	—	25	—	4	2	—	3	1	9	—	—	311	16.3 D	80.0 C
Miridae spp. (juv.)	—	—	—	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	2	3	—	—	—	1	—	—	—	4	—	—	—	—	—	—	—	—	15	0.8	—
Total:	68	38	81	34	41	52	31	54	44	69	35	20	46	28	27	49	86	29	28	18	74	21	80	52	38	54	18	13	39	29	9	46	16	77	53	18	20	60	46	21	123	122	1907	101.8	

+ = present, but not in a quantitative sample. I = Influent. D = Dominant. Acs = Accessory. C = Constant.

Table 4. — Sifting samples.

Sample No.:	22	27	70	69	51	73		
Sample size m^2:	1/4	1/4	1/2	1/2	1/10	3/10		
Plant community:	2c	2c	4b	4d	4d	4d		
Vegetation:	Dicranum scoparium		Hypnum cupressiforme Dicranum scoparium Dicranum polysetum "Cladina", etc.		Rhacomitrium canescens	Rhaco-mitrium canescens Hypnum cupressiforme Dicranum scoparium	Total	Percen-tage of total
Sciocoris cursitans	—	—	5	3	—	4	12	9.8 I
Macrodema micropterum .	—	—	—	—	—	18	18	14.6 D
Pionosomus varius	4	3	—	—	4	—	11	8.9 I
Stygnocoris pedestris	—	—	—	1	—	—	1	0.8
Plinthisus pusillus	7	3	11	23	—	9	53	43.1 D
Acalypta nigrina	1	—	—	—	—	—	1	0.8
Acalypta parvula	—	—	2	6	—	17	25	20.3 D
Acalypta spp. (juv.)	—	—	1	1	—	—	2	1.6
Total:	12	6	19	34	4	48	123	99.9
Per m^2:	48	24	38	68	40	160		

Table 5. — Searching samples.

Plant community:	1	2a		2c		4b	4d				6	Number of individuals caught	Percentage of total	Occuring in % of samples
	Beach	Outer green dune		Inner green dune		Carex dune grassl.	Grey dune				Dune heath			
							luxuriant			poor				
Sample No.:	64 *	57	58	10	13	63	68*	71	72*	61	48			
Sciocoris cursitans	—	—	—	—	—	1	—	2	—	—	1	4	2.0	30 Acs
Aelia acuminata	—	1	—	—	—	1	—	—	—	—	—	2	1.0	20
Pitedia juniperina	—	—	—	—	—	—	—	—	—	—	+	0 +	0.0	0
Caraleptus lividus	—	—	—	—	—	1	—	—	—	—	—	1	0.5	10
Alydus calcaratus	—	—	1	1	1	2	—	10	—	1	—	16	7.8 I	60 C
Chorosoma schillingi	—	—	—	1	—	—	1	2	—	1	—	5	2.5	40 Acs
Geocoris grylloides	—	1	—	—	—	—	3	3	2	—	—	9	4.4 I	30 Acs
Ischnodemus sabuleti	∞	∞	—	—	—	—	—	—	—	—	—	∞	—	20
Nysius thymi	—	4	—	—	—	—	1	—	—	1	—	6	2.9	30 Acs
Rhyparochromus pini	—	—	1	—	4	—	1	—	—	3	9	18	8.8 I	50 Acs
Trapezonotus arenarius	—	1	—	—	—	—	—	—	—	—	—	1	0.5	10
Macrodema micropterum	—	—	—	—	—	—	—	—	—	—	2	2	1.0	10
Pionosomus varius	—	—	—	5	1	—	—	—	—	—	—	6	2.9	20
Stygnocoris pedestris	—	1	2	—	—	—	—	—	1	—	15	19	9.3 I	40 Acs
Plinthisus pusillus	—	—	—	—	1	—	—	—	—	—	—	1	0.5	10
Ischnocoris angustulus	—	—	—	—	—	—	—	—	—	—	8	8	3.9	10
Scolopostethus decoratus	—	—	—	—	—	—	—	—	—	—	32	32	15.7 D	10
Eremocoris abietis	—	—	1	—	—	—	—	—	2	1	7	11	5.4 I	40 Acs
Piesma quadratum	6	—	—	—	—	—	—	—	—	—	—	6	2.9	10
Acalypta nigrina	—	—	—	—	1	—	—	—	—	—	—	1	0.5	10
Acalypta parvula	—	—	—	—	1	—	—	—	—	—	—	1	0.5	10
Coranus subapterus	—	—	—	2	—	1	—	10	—	—	+	13 +	6.4 I	30 Acs
Nabis pseudoferus	1	2	12	—	—	—	—	—	1	—	—	16	7.8 I	40 Acs
Nabis brevis	1	—	—	—	—	—	—	—	—	—	—	1	0.5	10
Nabis ericetorum	—	1	—	—	1	—	—	1	—	—	1	4	2.0	40 Acs
Stalia major	—	3	—	—	—	—	—	—	—	—	—	3	1.5	10
Globiceps fulvicollis	—	—	—	1	1	—	—	—	—	—	—	2	1.0	20
Orthotylus flavosparsus	7	—	—	—	—	—	—	—	—	—	—	7	3.4	10
Lygus pratensis	—	1	—	—	—	—	—	—	—	—	—	1	0.5	10
Polymerus brevicornis	—	—	—	—	1	—	—	—	—	—	—	1	0.5	10
Charagochilus gyllenhali	—	—	—	—	—	—	—	—	—	—	+	0 +	0.0	0
Phytocoris varipes	—	4	1	—	—	—	—	—	—	—	—	5	2.5	20
Stenodema laevigatum	—	—	—	—	—	—	—	—	—	—	1	1	0.5	10
Notostira elongata	—	—	1	—	—	—	—	—	—	—	—	1	0.5	10
Total:	15 (∞)	19 (∞)	19	10	12	6	6	28	6	7	76	204 (∞)	100.1	

*) Half an hour-samples.

Table 6. — 2 a. Outer green dune. Sweeping.
10 samples: 1—2, 14—15, 24—25, 36—37, 44, 50.

	Number of individuals caught	Average number per sample	Percentage of total	Occuring in % of samples
Ischnodemus sabuleti	103	10.3	32.8 D	90 C
Notostira elongata	82	8.2	26.1 D	100 C
Nabis pseudoferus	34	3.4	10.8 D	90 C
Chorosoma schillingi	27	2.7	8.6 I	90 C
Phytocoris varipes	17	1.7	5.4 I	70 C
Nabis brevis	10	1.0	3.2	20
Myrmus miriformis	8	0.8	2.5	40 Acs
Lygus maritimus	5 ×	0.5	1.6	20
Stygnocoris pedestris	4	0.4	1.3	40 Acs
Nabis flavomarginatus	4	0.4	1.3	40 Acs
Polymerus brevicornis	4	0.4	1.3	20
Adelphocoris lineolatus	3 ×	0.3	1.0	20
Aelia acuminata	2 ×	0.2	0.6	10
Piesma quadratum	2	0.2	0.6	10
Nysius thymi	1 ×	0.1	0.3	10
Legnotus picipes	1	0.1	0.3	10
Alydus calcaratus	1	0.1	0.3	10
Nabis ericetorum	1	0.1	0.3	10
Orthotylus flavosparsus	1	0.1	0.3	10
Calocoris norvegicus	1	0.1	0.3	10
Orius niger	0 ×	0.0	0.0	0
Nabis spp. (juv.)	3	0.3	1.0	—
Number of species: 21 Total:	314	31.4 (± 21.9)	99.9	

× = present, but not in a quantitative sample.
D = dominant.
I = influent.
C = constant.
Acs = accessory.

Table 7. — 2 b. Mixed green dune. Sweeping.
8 samples: 16, 26, 33—34, 42—43, 52, 53.

	Number of individuals caught	Average number per sample	Percentage of total	Occuring in % of samples
Notostira elongata	77	9.6	30.4 D	100 C
Nabis pseudoferus	51	6.4	20.2 D	75 C
Chorosoma schillingi	42	5.3	16.6 D	100 C
Phytocoris varipes	22	2.8	8.7 I	63 C
Myrmus miriformis	18	2.3	7.1 I	88 C
Cymus glandicolor	9	1.1	3.6	25
Ischnodemus sabuleti	5	0.6	2.0	25
Nabis flavomarginatus	4	0.5	1.6	38 Acs
Polymerus brevicornis	4	0.5	1.6	38 Acs
Aelia acuminata	3 ×	0.4	1.2	25
Nabis ericetorum	3	0.4	1.2	25
Stygnocoris pedestris	2 ×	0.3	0.8	25
Adelphocoris lineolatus	2 ×	0.3	0.8	25
Legnotus picipes	2	0.3	0.8	25
Nabis brevis	2	0.3	0.8	13
Stalia major	1 ×	0.1	0.4	13
Sciocoris cursitans	1	0.1	0.4	13
Nysius thymi	1	0.1	0.4	13
Megalocoleus molliculus	1	0.1	0.4	13
Dolycoris baccarum	0 ×	0.0	0.0	0
Charagochilus gyllenhali	0 ×	0.0	0.0	0
Nabis spp. (juv.)	3	0.4	1.2	—
Number of species: 21 Total:	253	31.6 (± 11.2)	100.2	

Table 8. — 2 c. Inner green dune. Sweeping.
10 samples: 4—5, 17, 21, 35, 38—39, 46, 49, 59.

	Number of individuals caught	Average number per sample	Percentage of total	Occuring in % of samples
Notostira elongata	73	7.3	23.5 D	100 C
Chorosoma schillingi	54	5.4	17.4 D	100 C
Phytocoris varipes	40	4.0	12.9 D	70 C
Nabis pseudoferus	39	3.9	12.5 D	60 C
Adelphocoris lineolatus	18 ×	1.8	5.8 I	50 Acs
Stygnocoris pedestris	13	1.3	4.2 I	50 Acs
Polymerus brevicornis	12	1.2	3.9	10
Nabis ericetorum	11	1.1	3.5	40 Acs
Myrmus miriformis	9	0.9	2.9	20
Ischnodemus sabuleti	9	0.9	2.9	40 Acs
Nabis flavomarginatus	7	0.7	2.3	30 Acs
Orthops kalmi	5	0.5	1.6	10
Nabis brevis	4	0.4	1.3	20
Nysius thymi	2	0.2	0.6	10
Lygus maritimus	1 ××	0.1	0.3	10
Cymus glandicolor	1 ×	0.1	0.3	10
Nabis ferus	1 ×	0.1	0.3	10
Megalocoleus molliculus	1 ×	0.1	0.3	10
Aelia acuminata	1	0.1	0.3	10
Dolycoris baccarum	1	0.1	0.3	10
Piesma quadratum	1	0.1	0.3	10
Lygus pratensis	1	0.1	0.3	10
Sciocoris cursitans	0 ×	0.0	0.0	0
Rhopalus parumpunctatus	0 ×	0.0	0.0	0
Stygnocoris fuligineus	0 ×	0.0	0.0	0
Orius niger	0 ×	0.0	0.0	0
Stenodema virens	0 ×	0.0	0.0	0
Nabis spp. (juv.)	2	0.2	0.6	—
Miridae spp. (juv.)	5	0.5	1.6	—
Number of species: 27 Total:	311	31.1 (± 9.6)	99.9	

Table 9. — 3. Dune pasture and swamp. Sweeping.
6 samples: 18—19—20, 23, 56, 67.

	Number of individuals caught	Average number per sample	Percentage of total	Occuring in % of samples
Myrmus miriformis	42	7	18.5 D	83 C
Phytocoris varipes	38	6.3	16.7 D	83 C
Plagiognathus chrysanthemi	32	5.3	14.1 D	83 C
Nabis pseudoferus	26	4.3	11.5 D	83 C
Adelphocoris lineolatus	26	4.3	11.5 D	100 C
Megalocoleus molliculus	13	2.2	5.7 I	33 Acs
Notostira elongata	11	1.8	4.8 I	67 C
Nabis flavomarginatus	9	1.5	4.0 I	67 C
Stygnocoris pedestris	7	1.2	3.1	67 C
Adelphocoris seticornis	6	1	2.6	67 C
Nabis ericetorum	5	0.8	2.2	67 C
Lygus pratensis	4 ×	0.7	1.8	17
Chorosoma schillingi	4	0.7	1.8	50 Acs
Ortholomus punctipennis	1	0.2	0.4	17
Globiceps fulvicollis	1	0.2	0.4	17
Lygus maritimus	1	0.2	0.4	17
Eurygaster testudinaria	0 ×	0.0	0.0	0
Dolycoris baccarum	0 ×	0.0	0.0	0
Alydus calcaratus	0 ×	0.0	0.0	0
Lygus rugulipennis	0 ×	0.0	0.0	0
Polymerus palustris	0 ×	0.0	0.0	0
Nabis spp. (juv.)	1	0.2	0.4	—
Number of species: 21 Total:	227	37.8 (± 24.6)	99.9	

Table 10. — 4a. Thalictrum dune grassland. Sweeping.
6 samples: 6—7, 11—12, 28, 60.

	Number of individuals caught	Average number per sample	Percentage of total	Occuring in % of samples
Adelphocoris lineolatus	24	4	19.5 D	100 C
Notostira elongata	15	2.5	12.2 D	67 C
Myrmus miriformis	12	2	9.8 I	83 C
Polymerus brevicornis	12	2	9.8 I	67 C
Chorosoma schillingi	10	1.7	8.1 I	67 C
Nysius thymi	10	1.7	8.1 I	50 Acs
Phytocoris varipes	10	1.7	8.1 I	67 C
Megalocoleus molliculus	6	1	4.9 I	50 Acs
Ortholomus punctipennis	5	0.8	4.1 I	33
Orthops kalmi	5	0.8	4.1 I	33
Stygnocoris pedestris	3	0.5	2.4	33
Nabis ericetorum	2	0.3	1.6	33
Cymus glandicolor	1	0.2	0.8	17
Globiceps fulvicollis	1	0.2	0.8	17
Polymerus vulneratus	1	0.2	0.8	17
Orius niger	0 ×	0.0	0.0	0
Nabis spp. (juv.)	1 ×	0.2	0.8	—
Miridae spp. (juv.)	5	0.8	4.1	—
Number of species: 16 Total:	123	20.5 (± 5.2)	100.2	

Table 11. — 4b. Carex dune grassland. Sweeping.
5 samples: 32, 40, 41, 47, 62.

	Number of individuals caught	Average number per sample	Percentage of total	Occuring in % of samples
Notostira elongata	34	6.8	24.5 D	60 C
Nabis pseudoferus	23	4.6	16.6 D	80 C
Phytocoris varipes	13	2.6	9.4 I	80 C
Nabis ericetorum	12	2.4	8.6 I	60 C
Adelphocoris lineolatus	11	2.2	7.9 I	60 C
Chorosoma schillingi	10 ×	2	7.2 I	60 C
Myrmus miriformis	10	2	7.2 I	20
Stygnocoris pedestris	9	1.8	6.4 I	80 C
Nabis brevis	5	1	3.6	20
Dolycoris baccarum	2	0.4	1.4	20
Alydus calcaratus	2	0.4	1.4	20
Nabis flavomarginatus	2	0.4	1.4	20
Orthops kalmi	2	0.4	1.4	40 Acs
Nysius thymi	2	0.4	1.4	20
Acalypta nigrina	1	0.2	0.7	20
Cymus glandicolor	0 ×	0.0	0.0	0
Miridae spp. (juv.)	1	0.2	0.7	—
Number of species: 16 Total:	139	27.8 (± 13.8)	99.8	

Table 12. — 4c. Dune slack grassland. Sweeping.
3 samples: 3, 54, 55.

	Number of individuals caught	Average number per sample	Percentage of total	
Nysius thymi	76	25.3	51.4	D
Adelphocoris lineolatus	18	6	12.2	D
Chorosoma schillingi	9	3	6.1	I
Nabis ericetorum	8	2.7	5.4	I
Myrmus miriformis	6	2	4.1	I
Notostira elongata	6	2	4.1	I
Stygnocoris pedestris	4	1.3	2.7	
Megalocoleus molliculus	4	1.3	2.7	
Plagiognathus chrysanthemi	3	1	2.0	
Nabis pseudoferus	2	0.7	1.4	
Lygus maritimus	2	0.7	1.4	
Phytocoris varipes	1 ×	0.3	0.7	
Ortholomus punctipennis	1	0.3	0.7	
Orius niger	1	0.3	0.7	
Lygus pratensis	1	0.3	0.7	
Polymerus vulneratus	1	0.3	0.7	
Stenodema laevigatum	1	0.3	0.7	
Cymus glandicolor	0 ×	0.0	0.0	
Orthops kalmi	0 ×	0.0	0.0	
Polymerus brevicornis	0 ×	0.0	0.0	
Miridae spp. (juv.)	4	1.3	2.7	
Number of species: 20 Total:	148	49.3	100.4	

Table 13. — 6. Dune heath. Sweeping.
7 samples: 8—9, 29, 30—31, 65, 66.

	Number of individuals caught	Average number per sample	Percentage of total	Occuring in % of samples
Scolopostethus decoratus	119	17	32.0 D	57 C
Stygnocoris pedestris	65	9.3	17.5 D	72 C
Orthotylus ericetorum	60	8.6	16.1 D	29 Acs
Nabis ericetorum	56	8	15.1 D	100 C
Nysius thymi	13	1.9	3.5	14
Notostira elongata	10	1.4	2.7	43 Acs
Chorosoma schillingi	8	1.1	2.2	43 Acs
Adelphocoris lineolatus	6 ×	0.9	1.6	43 Acs
Nysius helveticus	6	0.9	1.6	29 Acs
Alydus calcaratus	5	0.7	1.3	14
Macrodema micropterum	4	0.6	1.1	43 Acs
Nabis pseudoferus	4	0.6	1.1	29 Acs
Lygus maritimus	3	0.4	0.8	43 Acs
Polymerus brevicornis	2	0.3	0.5	14
Phytocoris varipes	2	0.3	0.5	14
Pitedia juniperina	1	0.1	0.3	14
Dolycoris baccarum	1	0.1	0.3	14
Picromerus bidens	1	0.1	0.3	14
Geocoris grylloides	1	0.1	0.3	14
Rhyparochromus pini	1	0.1	0.3	14
Acalypta nigrina	1	0.1	0.3	14
Megalocoleus molliculus	1	0.1	0.3	14
Globiceps fulvicollis	1	0.1	0.3	14
Polymerus unifasciatus	1	0.1	0.3	14
Number of species: 24 Total:	372	53.1 (± 140.1)	100.3	

Table 14. — 6. Dune heath. Sweeping.
a. "Younger dune heath".
4 samples: 8—9, 30—31.

	Number of individuals caught	Average number per sample	Percentage of total	
Nabis ericetorum	39	9.8	36.8	D
Nysius thymi	13	3.3	12.3	D
Notostira elongata	10	2.5	9.4	I
Chorosoma schillingi	7	1.8	6.6	I
Adelphocoris lineolatus	6	1.5	5.7	I
Alydus calcaratus	5	1.3	4.7	I
Scolopostethus decoratus	5	1.3	4.7	I
Stygnocoris pedestris	4	1	3.7	
Nabis pseudoferus	4	1	3.7	
Polymerus brevicornis	2	0.5	1.9	
Phytocoris varipes	2	0.5	1.9	
Pitedia juniperina	1	0.3	1.0	
Dolycoris baccarum	1	0.3	1.0	
Picromerus bidens	1	0.3	1.0	
Geocoris grylloides	1	0.3	1.0	
Macrodema micropterum	1	0.3	1.0	
Megalocoleus molliculus	1	0.3	1.0	
Globiceps fulvicollis	1	0.3	1.0	
Lygus maritimus	1	0.3	1.0	
Polymerus unifasciatus	1	0.3	1.0	
Number of species: 20 — Total:	106	26.5	100.4	

b. "Older dune heath".
3 samples: 29, 65, 66.

Scolopostethus decoratus	114	38	42.8	D
Stygnocoris pedestris	61	20.3	22.9	D
Orthotylus ericetorum	60	20	22.6	D
Nabis ericetorum	17	5.7	6.4	I
Nysius helveticus	6	2	2.3	
Macrodema micropterum	3	1	1.1	
Lygus maritimus	2	0.7	0.8	
Chorosoma schillingi	1	0.3	0.4	
Rhyparochromus pini	1	0.3	0.4	
Acalypta nigrina	1	0.3	0.4	
Adelphocoris lineolatus	0 ×	0.0	0.0	
Number of species: 11 — Total:	266	86.7	100.1	

Table 15. — "Green dune community" of Heteroptera. (Sweeping, 32 samples).

	Number of individuals caught		Average number per sample	Percentage of total		Occuring in % of samples	
Notostira elongata	266		8.3	26.6	D	97	C
Nabis pseudoferus	147		4.6	14.7	D	78	C
Chorosoma schillingi	133		4.2	13.3	D	94	C
Ischnodemus sabuleti	117		3.7	11.7	D	47	Acs
Phytocoris varipes	90		2.8	9.0	I	69	C
Myrmus miriformis	35		1.1	3.5		41	Acs
Adelphocoris lineolatus	34	×××	1.1	3.4		38	Acs
Stygnocoris pedestris	28	×	0.9	2.8		47	Acs
Nabis ericetorum	25		0.8	2.5		28	Acs
Nabis brevis	21		0.7	2.1		19	
Polymerus brevicornis	20		0.6	2.0		22	
Nabis flavomarginatus	17		0.5	1.7		34	Acs
Cymus glandicolor	10	×	0.3	1.0		9	
Orthops kalmi	7		0.2	0.7		9	
Lygus maritimus	6	×××	0.2	0.6		9	
Aelia acuminata	6	××	0.2	0.6		13	
Nysius thymi	4		0.1	0.4		9	
Dolycoris baccarum	3	×	0.1	0.3		6	
Legnotus picipes	3		0.1	0.3		9	
Alydus calcaratus	3		0.1	0.3		6	
Piesma quadratum	3		0.1	0.3		6	
Megalocoleus molliculus	2	×	0.1	0.2		6	
Sciocoris cursitans	1	×	0.0	0.1		3	
Nabis ferus	1	×	0.0	0.1		3	
Stalia major	1	×	0.0	0.1		3	
Acalypta nigrina	1		0.0	0.1		3	
Orthotylus flavosparsus	1		0.0	0.1		3	
Lygus pratensis	1		0.0	0.1		3	
Calocoris norvegicus	1		0.0	0.1		3	
Orius niger	0	××	0.0	0.0		0	
Rhopalus parumpunctatus	0	×	0.0	0.0		0	
Stygnocoris fuligineus	0	×	0.0	0.0		0	
Charagochilus gyllenhali	0	×	0.0	0.0		0	
Stenodema virens	0	×	0.0	0.0		0	
Nabis spp. (juv.)	8		0.3	0.8		—	
Miridae spp. (juv.)	6		0.2	0.6		—	
Number of species: 34 — Total:	1001		31.3 (± 14.6)	100.1			

Entomologiske Meddelelser 35 (1967)

Bernsteinborkenkäfer aus dem Zoologischen Museum der Universität Kopenhagen.

247. Beitrag zur Systematik und Morphologie der Scolytoidea.

Von
Karl E. Schedl
Lienz, Osttirol, Austria.

Im Jahre 1938 habe ich die Meldungen und Beschreibungen von Bernsteineinschlüssen, soweit sie Borkenkäfer der Familien Scolytidae und Platypodidae betreffen, einer eingehenden kritischen Sichtung unterzogen, die noch existierenden Typen überprüft und das einmalige Material des Geologisch-Palaeontologischen Institutes der Albertus Universität in Königsberg zu einer zusammenfassenden Studie über dieses Spezialgebiet innerhalb der Bernsteinfauna benützt. Die Ergebnisse dieser umfangreichen und schwierigen Arbeit wurden 9 Jahre später unter dem Titel »Die Borkenkäfer des Baltischen Bernsteins« im Zentralblatt für das Gesamtgebiet der Entomologie 2, 1947 veröffentlicht. Dabei ergab sich die Gelegenheit nachzuweisen, daß der Erhaltungszustand von Bernsteineinschlüssen meist ein ausgezeichneter ist und bei entsprechend vorsichtiger Präparation nicht nur die Mandibeln, die Fühler und Extremitäten freigelegt werden können, sondern auch Teile des Innenskelettes wie das Meso- und Metanotum, Phragmen, der Proventriculus, das Receptaculum seminis, der Penis etc. gut erhalten sind und Infrarotaufnahmen Einblicke in Skulpturdetails erlauben, die bisher kaum beobachtet wurden.

Die Sammlung aus Königsberg, die Grundlage aller weiteren Studien über Borkenkäfer aus dem baltischen Bernstein, habe ich nach dem Kriege dem Geologisch-Palaeontologischen Institut der Georg August Universität in Göttingen übergeben.

Nunmehr sandte mir Herr Sv. G. Larsson vom Zoologischen Museum der Universität Kopenhagen 15 Bernsteineinschlüsse

ebenfalls aus dem baltischen Raum zur Determination, eine erste Ergänzung zu meiner Studie aus dem Jahre 1938. Zur leichteren Handhabung wurden die einzelnen Einschlüße mit Nummern S 1 bis S 15 versehen. Davon scheidet S 1, weil in die Familie der Cisidae gehörig aus, wahrscheinlich auch S 6. Über die restlichen Einschlüsse läßt sich folgendes aussagen.

Zur Gattung *Hylastes* Er. ist S 12 »Preussen 1865 Mineralogisches Museum« zu stellen, doch sind die milchigen Trübungen so umfangreich, daß die Zuweisung zu einer bestimmten Art nicht möglich erscheint.

Als *Hylurgops pilosellus* Schedl kann Nr S 9 »1-7-1966, C. V. Henningsen« angesprochen werden. Die Fühlergeißel ist 7-gliederig, die Form und Skulptierung des Halsschildes bezw. der Flügeldecken entsprechen ganz der Type der genannten Art.

Vermutlich zur Gattung *Hylurgops* Lec. gehören zwei Exemplare der Nr S 15 mit der Bezeichnung »16-5-1957, A. Klarskov Andersen«, die je zur Hälfte angeschliffen sind und so nur das Negativ der einstigen Einschlüsse, den Abdruck derselben, zeigen. Ein drittes Stück derselben Serie ist von einer milchigen Trübung ganz umflossen und läßt keine weiteren Schlüsse zu.

Nr S 13 »30-6-1959, C. V. Henningsen« zeigt eine fünfgliederige Fühlergeißel, einander berührende Vorderhüften und Extremitäten ähnlich wie bei *Phloeosinites sexspinosus* Schedl. Von den Flügeldecken ist nur eine von der Basis bis zum Absturz frei, doch kann man unter einer glasigen Schicht auf den beiden Elytren auf dem Absturz zwei spitze Erhebungen erkennen, die den Zähnchen von *Phloeosinites sexspinosus* Schedl entsprechen dürften.

Ein weiterer Vertreter der Gattung *Phloeosinites* Hag. könnte im Einschluß S 5 »22-6-1955, Th. Hansen Mou« gegeben sein, doch läßt sich eine Artzugehörigkeit nicht erkennen.

Taphramites gnathotrichus Schedl ist durch acht Einschlüsse vertreten und zwar : 26-2-1955, C. V. Henningsen (S 2, S 3), 31-1-1956, C. V. Henningsen (S 14), 19-11-1958, C. V. Henningsen (S 11), 2-12-1912, Ringköbing-Egnen, C. F. Madsen (S 8), 1892, Bille, Nymindegab, S. Nielsen, Skjoldelev, Min. Mus. (S 7) und 31-3-1961, und 11-7-1966, Börge Mortensen (S 4, S 10). Im allgemeinen stimmen diese Stücke mit der Typenserie gut überein, S 11 ist etwas größer als der Durchschnitt und mißt 1.7 mm in der Länge, zeigt aber ansonsten keine Unterschiede. In S 14 sind die Fühler gut erkennbar, in anderen Stücken die Augen, die

Extremitäten etc., so daß die Artzugehörigkeit gesichert erscheint.

Es wäre zu wünschen, daß diese kurze Notiz Anlaß dazu gibt bisher unbearbeitete Borkenkäfer-Bernsteineinschlüsse in Instituten, Museen oder auch in Privatsammlungen einer Determination zuzuführen um so das Bild der Bernsteinfauna zu ergänzen, zu erweitern und vielleicht später einmal auch Aussagen über das quantitative Auftreten dieser an die Bernsteinproduzenten gebundenen Coleopteren zu ermöglichen.

Anmeldelse.

Sv. G. Larsson: **Insekter. Almindelig del.** — Danmarks Fauna 71, 313 sider. Gads Forlag, Kbh. 1966. Pris kr. 62,50.

Der har været grøde i Danmarks Fauna i den senere tid. Efter ovenstående bind er udkommet yderligere tre bind: to nyudgaver af tidligere billebind og et helt friskt, de første edderkopper. Nyt eller rettere nysammenstillet er også indholdet i Larssons bog, et bidrag, der afviger ganske fra seriens øvrige bind ved ikke at ligne en »fauna« på nogen måde og ved at være en særdeles udførlig »indledning« til en dyregruppe. En stor opgave: Insekter, almindelig del; første gang på dansk i dette omfang. — Bogen burde have været ud for adskillige år siden, og den vides da også at have været undervejs længe, men det er forståeligt, at det omfattende emne har krævet et langt svangerskab og en del fødselsveer, selv om hensigten ikke har været at skabe en kæmpe, rummende al visdom, men kun at frembringe en baby tilpas stor til »inden for beskedne rammer at give en orientering i insektlegemet og dets funktioner og en kortfattet oversigt over insektsystemet«. Det er dog forbløffende så meget bogen rummer, og den vil sikkert blive benyttet som en let tilgængelig opslagsbog, også selv om registret af pladshensyn ikke er blevet til »en slags entomologisk ordbog« som påtænkt. Emnet er som nævnt særdeles omfattende, og forf. må nødvendigvis have været i et stadigt dilemma: hvad skal med? skal dette behandles lidt bredere? kan der afkortes her? En bog af denne type kræver en ligelig fordeling af stoffet, og der opstår let en smule skævhed. F. eks. kunne anm. således godt have nøjedes med mindre om følehorn (p. 12), mens en lidt fyldigere omtale af et vigtigere gebet, hanlige og hunlige kønslemmer (p. 48 og en smule p. 115) havde været på sin plads, selvom der henvises til literatur. Kønslemmerne får ganske vist et par figurer (20—22) med på vejen, men da der f. eks. har indsneget sig nogen uoverensstemmelse mellem tekstens valver (nedre, *øvre* og indre) og figur 20 og 21's (nedre, *ydre* og indre), og da der meget generende bruges forskellige bogstavsymboler for de samme dimser på de to tegninger, ja, så er man lige vidt; rent bortset fra at man skal finde ud af, at fig. 20's C er blevet til B i figurteksten. Imms kan jo ikke

tage det så tungt om hans figur havde fået Snodgrass' betegnelser eller måske bedre, og afgjort lettere for uindviede, som bogen er skrevet for, nogle symboler med mening i i forhold til teksten. For en indviet siger *Cxpd,* desværre, mere en tekstens *coxit* (fig. 20), men hvem kan umiddelbart forstå, at *smcls* er griflens (*sty*'s) muskler, og at det beskednere *rvs* står for hofteblærens retraktormuskler, (fig. 18). (Forresten er det lidt svært at se, at fig. 21A viser et tværsnit gennem en [hel] opipositor!) — Anm. skal iøvrigt ikke granske efter mangelsymptomer eller småskrammer hos den velskabte og velkomne »baby«, men der er altså nogle få, og eksperter vil muligvis kunne finde større lyder end strejfet ovenfor. Blot skal endnu peges på en lille »bule« nemlig det usædvanlige at overordnen (p. 145) eller ordnen (p. 178) græshopper kaldes *Ensifera,* hvilken betegnelse rettelig hører til det man kalder løvgræshopper. — Det er muligt, at nogle kunne have ønsket sig andre og navnlig nyere literaturhenvisninger (f. eks. de gode hymenoptér-bind i Handbooks for the Identification of British Insects); andre kunne have ønsket flere illustrationer, men »beskedne rammer« sætter jo en grænse. Forf., eller snarere redaktøren, burde dog nok have spenderet mere netop på dette værk, der skal række ud til videre kredse, have appel. Der er blevet plads til en sjov, og måske nyttig, idé: en 19 siders nøgle ikke blot til insekter i næsten alle stadier, men også omfattende »andre på land og i ferskvand levende leddyr«.

Børge Petersen.

Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 42.)

Aquatic Hemiptera-Heteroptera of the Noona Dan Expedition to the Philippine and Bismarck Islands.

By
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Through the courtesy of Dr. Børge Petersen of the Zoological Museum of Copenhagen, I have been permitted to study collections of water-bugs made in the Philippine and Bismarck Islands by a Danish expedition (Wolff 1966; Petersen 1966). These notes are arranged in two parts, the first deals with the Bismarck Archipelago, the second with the Philippines.

1. Bismarck Islands.

NOTONECTIDAE.

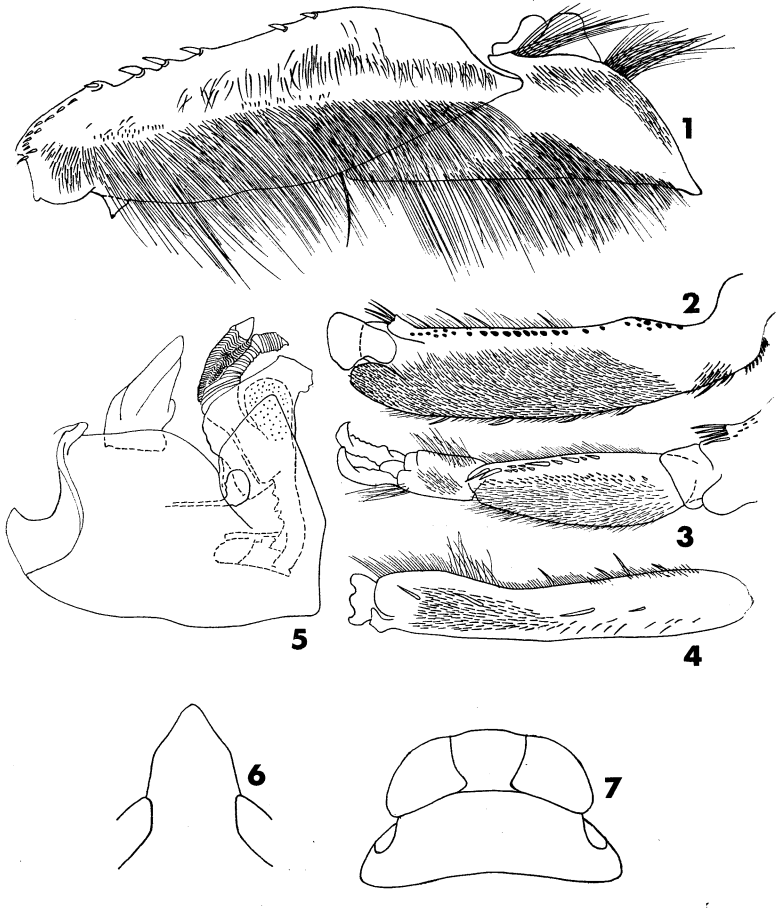
There only seems to be one record of Notonectidae from the Bismarck Archipelago, Laird (1947) recorded *Enithares bergrothi* Montandon from Palmalmal, New Britain. Laird figured the species concerned, it is quite clearly not *E. bergrothi* which is endemic to New Caledonia, but a new species. I have not been able to see any of the specimens collected by Laird, but the general appearance and shape clearly show that it is conspecific with specimens collected by the Noona Dan Expedition from New Britain, New Ireland and Manus Island. As would be expected, a proportion of the species represented are common and widely distributed. The collection also contains two species seemingly endemic to the islands. The Notonectidae of New Guinea are fairly well known (Brooks, 1951, Lansbury, 1962 for *Anisops* and Lansbury in-preparation for *Enithares).*

One species of *Enithares* was collected from various localities in the Bismarck Archipelago, it has no close affinities with any of the known species.

Enithares alexis, n. sp. Figs. 1—7.

Also refering to this species *E. bergrothi,* Laird, 1947, Trans. R. Soc. N.Z. 76(3):464—465.

Colour. Pale form; eyes reddish brown, vertex, pronotum, scutellum, elytra, membrane and legs yellowish brown, abdomen ventrally slightly darker.



Figs. 1—7, *Enithares alexis* Lansbury, n. sp., male. (1) mid-femora; (2) mid-tibia; (3) mid-tarsi; (4) fore tibiae; (5) genital capsule; (6) metaxyphus; (7) head and pronotum from above.

Dark form; Eyes variable from grey to black. Vertex pale green to reddish brown with two lateral brown stripes on frons. Pronotum, anterior ⅓—½ dark brown, medianly greyish hyaline,

posteriorly appearing black due to scutellar colour showing through. Scutellum black, sometimes with apex yellowish green, if so, scutellum dark brown. Clavus dark brown to black with outer margin greyish hyaline, sometimes with greyish area extending over most of clavus with only inner lateral margin dark. Corium with inner angle and posterior margin dark brown to black, remainder greyish hyaline. Opaque zone of membrane black, anterior and posterior lobes of membrane smoky brown. Legs and abdomen ventrally yellowish brown.

S t r u c t u r e, male and female. Viewed dorsally head rounded. Greatest width of head 5/6 pronotal humeral width, usually less than 3x anterior width of vertex, sometimes equal to or more than 3x anterior width of vertex. Synthlipsis ½ anterior width of vertex. Median head length slightly greater than anterior width of vertex. Head length to pronotal length variable; in ♂ equal to or less; ♀ head always longer than pronotum. Pronotal humeral width variable, about 3x median length. Lateral margins diverging, about ½ median length, posteriorly convex, centrally deeply emarginate. Dorsal margin of pronotal fovea curving laterad behind eyes Fig. 7. Nodal furrow curved cephalad, less than its own length removed from membranal suture. Mesotrochanter elongate with tip produced Fig. 1. Male mid-femora with a dense mat of long hairs and depressed, dorsal margin of mid-femora with several stout setae Fig. 1. Male mid-tibiae Fig. 2 with distal outer margin produced and rounded. Chaetotaxy of the ♂ mid-tarsi and claws Fig. 3. Male fore tibiae Fig. 4 with inner margin depressed. Female hind femora slightly constricted adjacent to trochanter. Genital capsule Fig. 5 posterior lobes bluntly acuminate, parameres rounded with two spine-like processess on inner margin. Metaxyphus bluntly acuminate Fig. 6.

H o l o t y p e ♀, 1 ♂ and 6 ♀ paratypes, NEW IRELAND: Lelet Plateau, Lemkamin, 900 m., 20 April. — 14 paratypes, NEW BRITAIN: Gazelle Peninsula, Yalom, 1000 m. 1 ♂, 1 ♀, 9 May; 2 ♂, 3 ♀, 12 May, Station 16, small river; 2 ♂, 2 ♀, 15 May, Station 20, ditch; 1 ♂, 23 May; 2 ♂, river west of Yalom, 900 m., 21 May, Station 23. — 2 paratypes, MANUS: Lorengau, 1 ♂, 1 ♀, 21 June, Station 52, brook in secondary forest. This series collected by the Noona Dan Expedition in 1962 is in the Zoological Museum, Copenhagen, except 6 paratypes in my collection. In addition I have seen before me a ♂ paratype NEW BRITAIN: Gazelle Pen.,

Upper Warangoi Illugi, 230 m., 8—11.xii. 1962, J. Sedlacek and a ♂ paratype, same data, 250—600 m., 28—30.xi. 1962, J. Sedlacek which will be deposited in the Bernice P. Bishop Museum, Honolulu.

The shape of the mesotrochanter and fore-tibia allies *alexis* with *E. malayensis* Brooks. *E. alexis* is however, clearly distinct, the very long mid-femoral hairs, stout setae on dorsal margin of mid femora and chaetotaxy of the mid-tibia are diagnostic.

Anisops nasuta Fieber, 1851.

MUSSAU: Lake Taletassi, 40 ♂, 120 ♀, also nymphs, 5 June; 1 ♂, 5 June, Station 29, plankton sample; 2 ♂, 6 June, bottom sample; Boliu, 1 ♀, 6 May 1962. — MANUS: Lorengau, 1 ♂, 21 June 1962, Station 52, brook in secondary forest; Lombrum, 1 ♂ 8 ♀, 29 June 1962, Station 69, damned lake; Papitalai Lagoon near Lombrum, 2 ♂, 4 ♀, 29 June 1962, Station 70, small lake.

A. nasuta is a common widespread Pacific species.

Anisops stali Kirkaldy, 1904.

MUSSAU: Talumalaus, 1 ♀, 19 Jan. 1962, mercury vapour light trap.

Widely distributed from Australia to Okinawa, not recorded from New Guinea.

Anisops occipitalis Breddin, 1905.

MUSSAU: Lake Taletassi, 140 m., 14 ♂, 25 ♀, 5 June 1962.

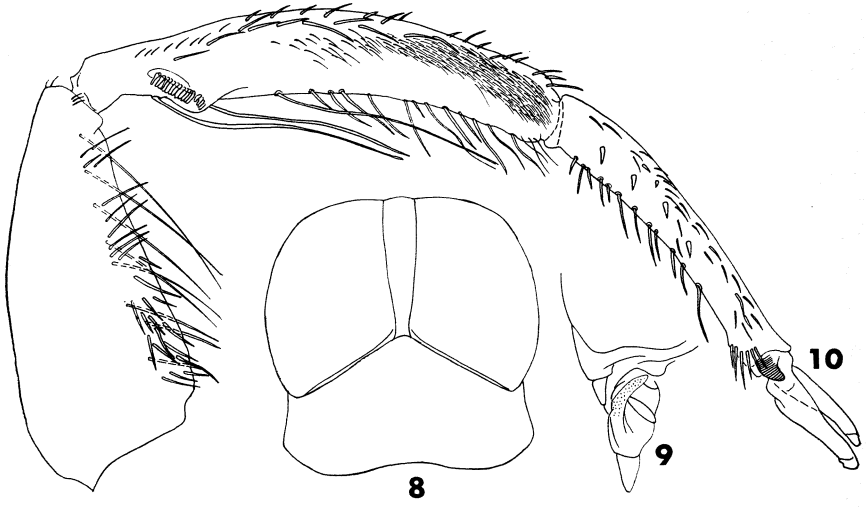
Lansbury (1965) discussed this species in some detail comparing the various forms including *E. leucothea* Esaki. The series from Mussau are most clearly allied to the New Guinea form (Lansbury, 1965:66, fig. 7d; 67, fig. 8c).

Anisops quadrispinosus, n. sp. Figs. 8—10.

Male, length 4·75 mm., maximum width 1·1 mm.

Colour. Eyes grey; vertex and most of pronotum greyish white, anterior lateral margins of pronotum blackish. Scutellum and elytra hyaline appearing dark brown due to dorsal abdominal pigmentation showing through. Legs, keel and connexival segments yellowish white, abdomen ventrally dark brown.

S t r u c t u r e. Eyes very large and voluminous Fig. 8. Greatest width of head slightly greater than the pronotal humeral width, just under 2× median head length and nearly 8× anterior width of vertex. Synthlipsis just over ¼ anterior width of vertex. Median head length 1/6 greater than pronotal length. Pronotal humeral width just over 2× median length, lateral margins divergent, posterior margin convex, centrally emarginate. Facial tubercle



Figs. 8—10, *Anisops quadrispinosus* Lansbury, n. sp., male. (8) head and pronotum from above; (9) rostrum; (10) fore leg.

very slightly raised. Labrum short, apex rounded, basal width ⅓ greater than median length. Rostral prong short and curved Fig. 9. Chaetotaxy of male fore leg Fig. 10. Stridulatory comb of about 19 pegs, inner pegs much shorter than the remainder.

H o l o t y p e ♂, MANUS: Lorengau, brook in secondary forest, 21 june 1962; in the Zoological Museum, Copenhagen.

In Brooks (1951) *quadrispinosus* keys out to couplet 95 and can be separated immediately from *A. deanei* Brooks by the shape and position of the rostral prong. Lansbury (1964:63 Figs. 82—84) also figures *A. deanei*. From *A. waltairensis* Brooks by the number of tibial stridulatory pegs, the latter having about 11—12 compared with 19 for *quadrispinosus*. See Lansbury (1964a:214—215 Fig. 6) for discussion of affinities of *A. waltairensis*.

NEPIDAE.

Laccotrophes sp.

MANUS: Papitalai Lagoon, near Lombrum, 2 nymphs, 29 June 1962, small lake near the sea (St. 40).

The two nymphs are undeterminable but belong almost certainly to this genus.

2. Philippine Islands.

BELOSTOMATIDAE.

Lethocerus insulanus (Montandon, 1898).

BALABAC: Dalawan Bay, 1 ♂, 5 Oct. 1961.

Menke (1960) gives the distribution of *insulanus* as Australia and Melanesia.

PLEIDAE.

Plea sobrina Stål, 1859.

PALAWAN: Brooke's Point, Uring Uring, 1 ex., 14 Aug. 1961. — TAWI TAWI: Tarawakan, 2 ex., 20 Oct. 1961.

According to Lundblad (1933) the nominate form of *P. sobrina* is endemic to the Philippines. A subspecies *P. s. horvathi* was described by Lundblad (l.c.) from New Guinea.

CORIXIDAE.

Micronecta quadristrigata Breddin, 1905.

PALAWAN: Brooke's Point, Uring Uring, 10 ♂, 5 ♀, 14 and 21 Aug. 1961, mercury vapour light trap.

TAWI TAWI: Tarawakan, 9 ♂, 13 ♀, 20 and 21 Oct. 1961, 12 ♂, 10 ♀, 11—15 Nov. 1961; Lapid Lapid, 4 ♂, 2 ♀, 19 Nov. 1961, all trapped by mercury vapour light.

This is a fairly widespread oriental species. Lundblad (1933) recorded it from India, Burma, Ceylon, Java, Sumatra and the Philippines.

NOTONECTIDAE.

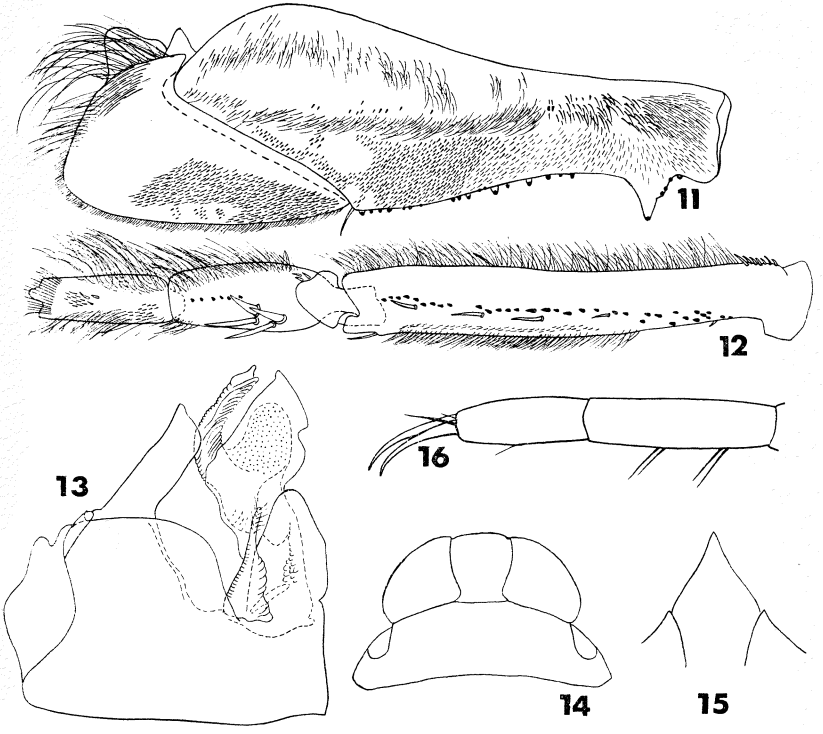
Enithares freyi quadrispinosus subsp. nov. Figs. 11—15.

Males length 9—9.75 mm., maximum width 3.5—3.75 mm. Females length 8.75—9.5 mm., maximum width 3.5—3.75 mm.

Shape, fairly large robust species, greatest width across prono-

tal humeral angles. Abdomen tapering from posterior margin of pronotum.

C o l o u r. Eyes light grey to dark brown. Vertex, anterior half of pronotum and most of scutellum yellowish brown. Anterior



Figs. 11—15, *Enithares freyi quadrispinosus* Lansbury, subsp. n. (11) mid-femora; (12) mid-tibia and tarsus; (13) genital capsule; (14) head and pronotum from above; (15) metaxyphus.
Fig. 16, *E. freyi freyi* Brooks, male mid-tarsus and claws. (Froeschner original).

half of pronotum and elytra excluding membrane hyaline shining grey appearing black due to dorsal abdominal pigmentation showing through. Membrane suffused with brown. Legs and abdomen ventrally yellowish brown.

S t r u c t u r e. Viewed dorsally head rounded. Anterior width of vertex extending beyond eyes. Greatest width of head 4/5 pronotal humeral width. Head width to anterior width of vertex variable, at most just over 3×, sometimes slightly less than 3× and

between 2¼—2½ × median head length. Synthlipsis just over ½ anterior width of vertex. Median head length slightly greater than anterior width of vertex and slightly shorter than pronotum. Pronotal humeral width variable, slightly more or less than 3× median length. Pronotal lateral margins divergent, just over ½ median length, posterior margin convex, centrally emarginate. Dorsal margin of pronotal fovea directed obliquely laterad behind eyes Fig. 14. Nodal furrow basally straight, tip inclined cephalad, less than its own length removed from the membranal suture. Mesotrochanter of male rounded Fig. 11. Male mid-femora covered with short blunt spines Fig. 11. Male mid-first tarsal segment with four very stout long spines Fig. 12 and with about six black spicules. Genital capsule Fig. 13 parameres elongate, triangular, apices rounded with numerous hairs Fig. 13. Metaxyphus Fig. 15.

Holotype ♂, 5 ♂ and 5 ♀ paratypes, PALAWAN: Mantalingajan, Pinigisan, 600 m., 14 Sept. 1961, taken in a very small shallow water hole in slow stream; 2 ♂ paratypes, ibid., 1 and 12 Sept. 1961.

Comparative notes. Most closely allied to *E. thienemanni* Lundblad by the shape of the parameres. *E. thienemanni* has a large tubercle on the inner surface of the male mid-tibia distally which is absent in *freyi freyi* and *frey quadrispinosus*. Lastly *thienemanni* appears to be endemic to Sumatra.

Brooks (1948) described *E. freyi* from Mt. Prov., P. I., Benguet, July, 15, 1946, Dr. G. Frey. I have not been able to trace this locality. The holotype male of *freyi* is in the Smithsonian Institution Washington, not in the British Museum (Natural-History) as stated by Brooks (1948). I have not been able to study the type of *freyi* Brooks. Dr. R. Froeschner (Washington) has compared material from Palawan with Brooks's type. He considers them to be extremely close, the only difference being in the chaetotaxy of the middle tarsi. Dr. Froeschner has made a sketch of the male mid-tarsus and claws of *freyi freyi* from a slightly different aspect, Fig. 16, this shows the slightly different arrangement of the large spines on the tarsus.

Two other species of *Enithares* have been recorded from the Philippines, *E. martini* Kirkaldy and *E. bakeri* Brooks. Lundblad (1933) queried the occurrence of *E. sinica* (Stål), this species is confined to the asiatic mainland and Formosa (Lansbury in preparation).

Anisops tahitiensns Lundblad, 1933.

TAWI TAWI: Lapid Lapid, 1 ♂, 19 Nov. 1961, mercury light trap. A very common widespread oriental species.

Anisops sp.

PALAWAN: Brooke's Point, Uring Uring, 1 ♀, 16 Aug. 1961, mercury light trap.

Acknowledgments.

I wish to thank Dr. R. C. Froeschner for his invalubable assistance regarding *Enithares freyi freyi* Brooks and Dr. A. Wroblewski, Poznan for checking my determination of *Micronecta quadristrigata* Breddin.

Summary.

A new species of *Enithares* and *Anisops,* respectively (Notonectidae) are described from the Bismarck Archipelago, and a new subspecies of *Enithares* is described from the Philippines. Records and distributional notes are given on a few other aquatic Heteroptera from these regions.

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Anmeldelse.

Victor Hansen: **Biller XXIII. Smældere og Pragtbiller.** Larverne ved K. Henriksen. Danmarks Fauna 74, Kbhv. 1966, 179 pp. Pris ib. kr. 38,25

Det foreliggende bind afløser K. Henriksen's Pragtbiller og Smeldere, Danmarks Fauna bind 14 fra 1913. Dette bind har længe været udsolgt og er iøvrigt på mange punkter ikke længere tidssvarende.

Efter indledende bemærkninger om Pragtbillernes og Smældernes ydre anatomi og levevis følger oversigtstabeller over slægtsgrupper, slægter og arter. Bestemmelsestabeller og artsbeskrivelser er fortræffelige og reducerer vanskelighederne ved bestemmelsen så selv en begynder hurtigt vil kunne komme til et sikkert resultat, ikke mindst fordi der ved beskrivelsen af de enkelte arter er lagt vægt på at fremhæve de egenskaber, der karakteriserer arterne i forhold til beslægtede arter. Teksten er ledsaget af mange udmærkede tegninger af de i oversigtstabellerne angivne detailler, og endelig er der en lang række meget smukke habitusfigurer af enkelte arter, i reglen mindst 1 art af hver slægt. Larveafsnittet er et genoptryk af Henriksens afsnit i bind 14, dog har forfatteren foretaget en del tilføjelser på grundlag af senere fremkommet litteratur; således er der medtaget en halv snes senere beskrevne larver.

Det nu foreliggende bind er samtidig afslutningen på et imponerende arbejde, der har strakt sig helt fra 1918, da Victor Hansen udgav sit første billebind i serien i Danmarks Fauna. Gennem årene har han støt arbejdet sig igennem hele billesystemet, der nu foreligger i ialt 18 bind, hvortil kommer endnu 2 bind: en almindelig del og et tillægsbind, der medtager de ændringer, der er sket i de næsten 50 år behandlingen af Danmarks biller har stået på. Larverne, der desværre kun er behandlet i knapt halvdelen af bindene, er dog med undtagelse af smælderbindet bearbejdet af andre.

At Victor Hansen som »fritidsbeskæftigelse« har kunnet overkomme dette stort anlagte og stort gennemførte værk er helt utroligt. Det er en meget stor fordel, at hele værket er skrevet af samme forfatter. Den kontinuitet, der derved er opnået i selve behandlingsformen, gør det let at arbejde med bindene. Hele værket er baseret på forfatterens indgående kendskab til den danske billefauna og er skrevet i et klart og overskueligt sprog, som overalt viser den sikreste vej til bestemmelsen, og forfatterens mange tegninger kan ikke gøres bedre. Der er således al mulig grund til at takke Victor Hansen for dette smukke arbejde, og man må håbe, at det vil kunne inspirere endnu flere og især yngre til at beskæftige sig med den danske billefauna.

F. Bangsholt.

Dansk fund af sommerfuglen Rhyacia (Epipsilia) grisescens F. (Lep., Noct.).

Af
Niels L. Wolff
Zoologisk Museum, København.

På det københavnske elektricitets- og varmeværk, Svanemølleværket, der ligger i byens nordøstlige hjørne ud til Øresund, er skorstenene af dekorative årsager fra solnedgang til solopgang oplyst af projektører med lysstærke kviksølvdamplamper (fig. 1). Under gunstige vejrforhold — dvs. i stille nætter — virker denne illumination tiltrækkende på adskillige insekter, ikke mindst natsommerfugle.

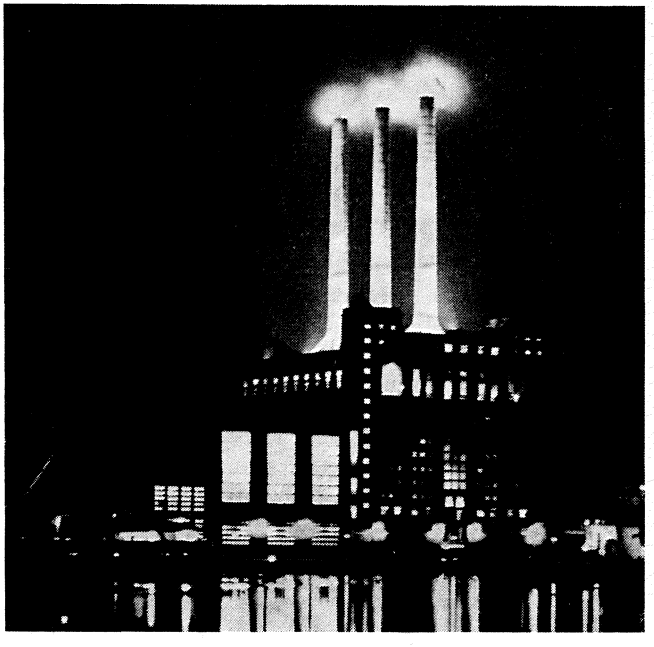

Fig. 1. Det københavnske elektricitetsværk, Svanemølleværket ved nat. (G. Andersen fot.).

Lige fra værkets første start har jeg haft lejlighed til på nærmeste hold at følge også insektlivet, og jeg har dagligt »ført protokol« over samtlige de sommerfugle, jeg har observeret, og har mellem disse konstateret et ikke helt ringe antal arter, man på forhånd næppe forventede at finde et sådant sted. Her skal jeg imidlertid ikke gå nærmere ind på dette problem, men blot anmelde fundet af en for Danmark ny »ugle« *Rhyacia (Epipsilia) grisescens* F.

Jeg fandt den om morgenen 25. juli 1966 i nærheden af den øverst oppe anbragte projektør (i kote 50 m), hvor den havde skjult sig på taget op mod et trappetrin bag en dør, og derved undgået den skæbne, som normalt er beskåret de sommerfugle, der sidder frit fremme på taget efter lysets frembrud, nemlig omgående at forsvinde i en fuglemave. Den må være kommet i løbet af natten mellem 24. og 25. juli. Fig. 2 viser (i dobbelt størrelse) det omtalte exemplar.

Arten hører til de boreo-alpine arter og har som sådan to adskilte forekomstområder. I dens sydlige (alpine) udbredelse findes den i næsten hele alpeområdet fra Frankrig i vest over Schweiz og Tyrol østpå. Dens nordlige udbredelse, der her interesserer mest, omfatter ikke Balticum, derimod Finland, hvor den kendes mange steder fra, fortrinsvis i de sydvestlige og sydlige provinser især i skærgården, og østpå i nogle fund fra Karelen. I Norge findes den i næsten hele landets sydlige del og går nordligst op i det indre af Sør-Trøndelags Fylke (Opheim 1962:4). I Sverige følger den østkysten fra Uppland og Västmannland ned til Blekinge, men når ikke så langt sydpå som til Skåne. Langs Sveriges vestkyst går den fra den massive udbredelse i Norge mod syd og tangerer det nordvestlige Skåne (et ældre fund fra Skälderviken), men er ikke fundet på Kullen, hvor der netop i de senere år har været samlet energisk.

Dette billede af artens udbredelse gør ikke en forekomst i Danmark synderlig vel motiveret. Da larven lever på lave planter såsom græs og mælkebøtte, kan foderproblemet ikke stille sig hindrende for artens trivsel her i landet, hvad der derimod er tilfældet med dens biotop, idet arten er et udpræget bjergdyr.

Rhyacia grisescens er omtalt (Hoffmeyer 1962: 56—57) blandt arter, som kan forventes her i landet, og der fremhæves ligheden mellem *Rhyacia simulans* Hufn. og *grisescens* samt tilføjes, at de utvivlsomt er nær beslægtede. I virkeligheden er ligheden nu ikke

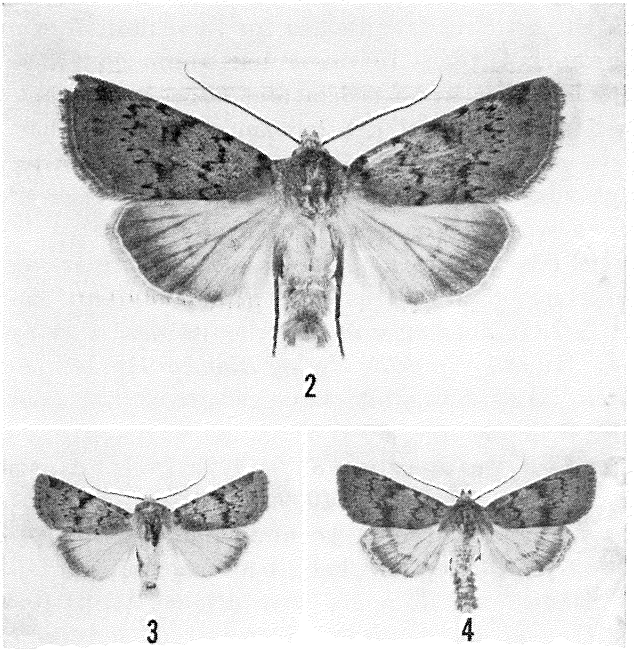

Fig. 2—3—4. *Rhyacia (Epipsilia) grisescens* F.

Fig. 2. Dania, København, Svanemølleværket 25.VII.1966, Niels L. Wolff leg. (× 2). Fig. 3. Suecia, Halland, Fjärås 12.VIII.1961, Ingv. Svensson leg. (× 1). Fig. 4. Norvegia, Malmin Bj. 17.VII.1960, Arne Nielsen leg. (× 1). (H. V. Christensen fot.)

Fig. 5. ♂-genitalier af *Rhyacia (Epipsilia) grisescens* F. (× 16), Suecia, Bohuslän, Grebbestad 14—16.VIII.1961, Ingv. Svensson leg. (præp. NLW 3382). (H. V. Christensen fot.)

så stor, at der er mindste mulighed for forvexling. *R. simulans* er større og mørkere, dens forvinger har almindeligvis en olivenbrunlig tone og har tegningselementer udbredt over hele vingen, der herved virker småprikket, hvorimod *grisescens* har ren grå grundfarve og er kontrastrigt tegnet med markante tværlinier af hvilke den ydre er stærkt savtakket. Fig. 3 og 4 viser (i naturlig størrelse) en svensk og en norsk han af *grisescens.*

Der er slet ikke tale om, at *grisescens* og *simulans* er nær beslægtede, og i nyere literatur (f. ex. Forster & Wohlfahrt 1963:27) og Opheim (1962:4) anbringes de to arter da også i to forskellige slægter, henholdsvis *Epipsilia* Hb. og *Rhyacia* Hb. Da genitalierne af *grisescens* ikke findes afbildet i de gængse værker, vises på hosstående fig. 5 de særprægede ♂-genitalier af denne art. Genitalierne af *simulans* er af en ganske anden type. De er f.ex. vist (under navnet *pyrophila)* hos Pierce (1909, pl. 19); valven er af en helt anden form, aflang, helrandet, jævnt afsmalnende mod spidsen og meget lig valven hos dens virkelig nære slægtning fra Island og Grønland, *Rhyacia quadrangula* Zett. (afbildet Wolff 1964, pl. 7).

Resultaterne af de senere års intensiverede indsamlinger har ført til erkendelsen af det faktum, at den danske sommerfuglefauna ikke er nær så stabil, som man tidligere antog. Som en naturlig følge af den letbevægelighed, der er karakteristisk for adskillige sommerfuglearter, må der til stadighed regnes med en vis tilkomst udefra af nye arter. Af disse opholder nogle sig kun så kortvarigt indenfor landets grænser, at det er et lykketræf, om de overhovedet bemærkes, andre kommer mere eller mindre regelmæssigt, såsom de klassiske immigranter, og enkelte synes at akklimatisere sig. Vil man — som tankeexperiment — opstille en nøjagtig liste over de sommerfuglearter, der findes indenfor landets grænser, må en sådan derfor blive forskellig fra år til år og kan alligevel ikke blive korrekt, da den må indskrænke sig til at omfatte, hvad man mere eller mindre tilfældigt får kendskab til.

De fleste af de arter, vi betegner som »tilfældige gæster«, kommer sydfra, men der sker også tilskud fra nord. Som exempler herpå kan nævnes de tre ugler *Platyperigea albina* Ev. (= *Caradrina cinerascens* Tgstr. (!)), *Amathes alpicola* Zett. og *Amathes speciosa* Hb. og de tre målere *Semiothisa loricaria* Ev., *Eulype subhastata* Nolck. og *Entephria caesiata* Schiff., af hvilke forekomsten af den første art i hver gruppe synes at have været éngangsforeteelser, medens *E. caesiata* har akklimatiseret sig så

godt, at den i 1966 har kunnet fanges i hundredvis i det nordligste Jylland. Hvad angår *Rhyacia grisescens,* der også er kommet nord fra, er mulighederne for existens her i landet næppe til stede andre steder end eventuelt på Bornholm.

For detaillerede oplysninger om artens udbredelse i Sverige takker jeg skovrider Ingv. Svensson, Österslöv, Sverige, og tandlæge Sv. Kaaber, Århus, Danmark; for sammenligningsexemplarer dels førstnævnte, dels læge Arne Nielsen, Dale, Norge, samt for fotografierne henholdsvis laborant G. Andersen, Svanemølleværket, og fotograf H. V. Christensen, Zoologisk Museum, København.

Summary.

The first Danish find of the boreo-alpine species *Rhyacia (Epipsilia) grisescens* F. is recorded. A male specimen (fig. 2) was attracted the night between 24th and 25th July 1966 by the illumination (powerful MV-lamps) placed on the roof of the Svanemølle Power Station in Copenhagen (fig. 1). Its northern distribution covers most parts of southern Norway. In Sweden the species is found in the mountains along the coasts, the southernmost point on the east as well as the west coast being at abt. 56° 15′ lat. N.

Litteratur.

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Nye sommerfugle (Lepidoptera) 1966.

Af
Wilhelm van Deurs
Frugtparken 7, Gentofte.

På Entomologisk Forenings møde den 15. marts 1967 blev der givet meddelelser om følgende 5 for den danske fauna nye arter, alle taget i 1966.

Dysauxes ancilla L. 1 eks. ♂ 6/7 på Hg-lys Ulfshale, Møn (Bent Holm Thomsen).

Rhyacia grisescens F. 1 eks. 25/7 på lys på taget af Svanemølleværket, København (N. L. Wolff). *)

Leucania favicolor Barr. 2 eks. 20/7 og 28/7 Rømø (Ole Rich).

Hypena lividalis Hb. 1 eks. 19/10 på Hg-lys Dueodde, Bornholm (Ole Rich).

Eucosma crenana Hb. Ca. 30 overvintrede eks. (imago) 22/5 Svinkløv, Jylland (P. Bjørn, G. Pallesen, L. Trolle), larver i antal 26/6 sammesteds på Salix repens (G. Pallesen), 6 eks. (imago) 25/9 ligeledes sammesteds (G. Pallesen, N. L. Wolff).

Summary.

A list is given of 5 species of Lepidoptera new to the Danish fauna.

*) Se Entomologiske Meddelelser, bind 34, p. 99—103.

Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 43.)

Some Muscidae (Diptera) from the Philippine Islands and the Bismarck Archipelago. 1. The Genus Myiophaea Enderlein.

By
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British Museum (Natural History), London.

Introduction.

Malloch (1926: 553) erected the genus *Gordonia* for a new species from Queensland, *fulvithorax* Malloch, and placed it in the Muscinae. Séguy (1937: 387) included the genus in the Muscinae in his catalogue of the World Muscidae, but Hennig (1963: 900) suggested that it might belong to the Phaoniinae, tribe Dichaetomyiini, and pointed out that the name is preoccupied by the reptilian genus *Gordonia* Newton, 1892. The latter author (1965: 36) has more recently referred to *Gordonia,* but has been unable to clarify its systematic position through lack of material.

Enderlein (1935: 240) erected the genus *Myiophaea* for a new species from New Britain, *ralumensis* Enderlein. Séguy (op. cit.) did not include the genus in his catalogue, as his survey of the literature closed before the publication of Enderlein's paper, and the genus has subsequently been ignored.

Van Emden, in his key to genera of the Muscinae (1965: 39) erected the genus *Aubertinella* for two species, *Musca aricioides* Walker (the type-species) and *Ochromyia fasciata* Macquart (= *Bengalia spissa* Walker), placing it in the Muscinae. No full generic description was given as the species included were not known from the Oriental region, to which Van Emden's work was confined.

Present studies of the Muscidae of the Indo-Australasian region have shown that the type-species of *Myiophaea* and *Gordonia* Malloch are conspecific, and that the two species described by Walker and placed by Van Emden in *Aubertinella* should also be assigned here. Further material from New Britain has been found in the

collection of the Noona Dan Expedition (Petersen 1966) submitted for identification by Dr. Leif Lyneborg, Copenhagen, as well as in the Indo-Australasian Muscid accessions in the British Museum (Natural History), London, and in some material sent by Dr. H. Schumann, Berlin. The opportunity is taken of presenting a discussion of the genus and its relationships together with these new data.

Myiophaea Enderlein.

Myiophaea Enderlein, 1935, Sber. Ges. naturf. Freunde Berl., 1935: 240. Type-species: *M. ralumensis* Enderlein, 1935 (= *spissa* Walker, 1859, by original designation and monotypy.

= *Gordonia* Malloch, 1926, Proc. Linn. Soc. N.S.W., 51: 553; Séguy, 1937, Genera Insect., 205: 387; Hennig, 1963, Fliegen palaearkt. Reg., 63b, Muscidae: 900; Hennig, 1965, Stuttg. Beitr. Naturk., 141: 36. *Nec* Newton, 1892: Reptilia. S y n. n o v.
Type-species: *G. fulvithorax* Malloch, 1926 (= *spissa* Walker, 1859), by original designation and monotypy.

= *Aubertinella* Van Emden, 1965, Fauna of India, Muscidae: 39. S y n. n o v.
Type-species: *Musca aricioides Walker,* 1864 (= *spissa* Walker, 1859), by original designation.

D i a g n o s i s.

Non-metallic species of moderate size and bulky appearance, with the characters of the subfamily Muscinae, tribe Muscini. Among the genera of the Muscini lacking a *pv* seta on mid tibia, *Myiophaea* is unique in possessing the subcostal sclerite setulose, vein 1 with setulae on dorsal surface, and vein 4 with a rounded and not angular forward curvature before wing-margin. See figs. 4 and 5.

The following characters are also of importance but are not necessarily diagnostic:

Male head holoptic, without *ors;* female head dichoptic, with several proclinate *ors* but without crossed interfrontal setae. Arista long plumose. *Acr* 0 + 1. *Dc* 2 + 4 (—5). 1 *ia,* placed caudad of 3rd *dc. Pra* present, almost as long as 2nd *npl.* Supra-squamal ridge bare. Prosternum broad, bare (fig. 6). Propleural depression bare. Prostigmatal seta absent, the area with numerous rather dense setulae. Infra-alar bulla bare. Pteropleuron with black setulae on entire length of sub-alar ridge. *Stpl* 1 + 2. Pre-episternite III setulose. Legs without striking modifications, "*p*" setae on mid tibia variable in number and strength, and not always all in a true

posterior position. Stem-vein bare dorsally, with several conspicuous setulae ventrally as far as but not beyond humeral cross-vein (fig. 4). Vein 3 with numerous conspicuous black setulae on both surfaces that extend from the node at base to well beyond small cross-vein. Lower squama truncate (fig. 9). Sternite I densely setulose.

Affinities and Discussion.

Myiophaea is apparently most closely related to the genera *Morellia* Desvoidy and *Rypellia* Malloch which it replaces in the Australasian region: these two latter do not extend east of the Indo-Malayan region. In general facies it most closely resembles *Rypellia,* particularly in the pattern of dusting and the bulky build, whereas the species of *Morellia,* except for the metallic green species of South America, are more elongate in shape and more brassy blue in ground-colour. The absence of the *pv* seta on mid tibia might suggest a closer relationship between *Myiophaea* and *Morellia,* but this character is evidently of greater diagnostic than phylogenetic value in the Muscini and the true relationships of *Myiophaea* are with *Rypellia* and, more distantly, with *Dasyphora* Desvoidy and *Orthellia* Desvoidy.

The subcostal sclerite is very rarely setulose in the Muscidae, such setulae being found in the Indo-Australasian fauna only in some Muscini and in the Australian *Rhynchomydaea australis* Malloch, a problematic species doubtfully assigned to the Mydaeinae at present. In *Orthellia, Dasyphora, Rypellia* and *Myiophaea* it is setulose, whereas in *Musca, Morellia, Pyrellia* and most other genera it is invariably bare. *Orthellia* and *Dasyphora* contain species of metallic green colour and *Orthellia* has the infra-alar bulla setulose, as in the subgenus *Panaga* Curran of *Dichaetomyia* Malloch. In Old World *Morellia,* vein 1 is always bare, but in *Rypellia* it is often setulose on the dorsal surface, and the stem-vein, which at most has 1-2 setulae on basal part of ventral surface in *Morellia,* always has at least 1 setula at the apex on b o t h wing-surfaces in *Rypellia,* b e y o n d the humeral cross-vein.

The broad bare prosternum of *Myiophaea* (fig. 6) resembles that of *Rypellia,* and this is an important character in the Muscini that speaks for the affinity of these genera. *Morellia* also possesses a broad prosternum, but it may be either bare or setulose; it is broad and setulose in *Orthellia* and in the group *Dasyphoromima* Zimin

of *Pyrellia*. In *Pyrellia* s.str. and *Dasyphora* it is very slender and bare (cf. Hennig, 1963: fig. 373 on page 927).

A further notable character of *Myiophaea* is the shape of the lower squama (fig. 9). In his description of *Gordonia,* Malloch (l.c.) noted that it was "rounded and narrower" in comparison with *Morellia* and *Pyrellia*. It is undoubtedly of the *Musca*-type rather than of the *Phaonia*-type, but is at the same time very distinctly reduced so that its configuration is not in total conformity with that of, for example, *Musca* or *Orthellia*.

Dissections of the male genitalia of *Morellia hortorum* Fallén (type-species of *Morellia*), *Rypellia flavipes* Malloch (type-species of *Rypellia*), and *Myiophaea* shew that these three genera are very closely related. The aedeagi are extremely similar in basic structure (figs. 1 to 3). In *Morellia,* the epiphallus bears a strongly sclerotised strip, and also has a curious eversible membraneous structure at the distal end, whilst in *Rypellia* the structure is simple but the shape is quite different, and in *Myiophaea* the distal end is only weakly sclerotised. The shape of the post-gonite and the degree of heavy sclerotisation of the phallapodeme are very characteristic in the three genera. Furthermore, the distiphallus in *Rypellia* is very distinctive. The eversible juxta has short teeth towards the apex, and around the distal margin the membrane is puckered, producing a scale-like effect. In *Morellia* the juxta is a simple membraneous sac, and in *Myiophaea* it is apparently the same: I have dissected several males of *Myiophaea,* but in only one specimen was the juxta partially everted (fig. 3b) and under high magnification it agreed with *Morellia* in taking the form of an unmodified sac.

Much work still remains to be done on the relationships among the genera of the Muscini, but for the present I am retaining *Myiophaea* as a distinct genus, as the Australasian representative of the Indo-Malayan *Rypellia,* and am basing this conclusion primarily upon external characters, particularly those of the wings. Further discussion of its status and phylogenetic position must be deferred to a more comprehensive treatment of the Muscine genera.

Distribution.

Papuan subregion, within the triangle formed by Misoöl, New Guinea and Queensland. Not known from the Solomon Islands.

Biology.

Adults have been taken on vegetation, habits otherwise unknown. Life-history unknown; the ovipositor is adapted for ovipary.

Type-species, and only known species:

Myiophaea spissa (Walker), stat. rev.

spissa Walker, 1859, J. Proc. Linn. Soc., 3: 107 (*Bengalia*); Walker, 1866, J. Proc. Linn. Soc., 9: 22 (*Bengalia*); Van der Wulp, 1896, Cat. descr. Dipt. S. Asia: 152 (*Ochromyia*); Stein, 1901, Z. syst. Hymenopt. Dipterol., 4: 210 (*Spilogaster*); Sack, 1914, Abh. senckenb. naturforsch. Ges., 35: 62 (*Ochromyia*); Stein, 1918, Annls hist.-nat. Mus. natn. hung., 16: 165 (*Morellia*); Stein, 1919, Arch. Naturgesch., 83 A 1: 109 (*Morellia*); Séguy, 1935 Encycl. ent., B II, Dipt. 8: 110 (*Morellia*); Séguy, 1937, Genera Insect., 205: 393 (*Morellia*); Van Emden, 1965, Fauna of India, Muscidae: 39 (*Aubertinella*); Pont, 1966, Ann. Mag. nat. Hist. (13), 9: 97 *(Myiophaea)*.
Lectotype ♂, ARU IS. In the British Museum (Natural History), London. Designated by Pont (l.c.).

= *aricioides* Walker, 1864, J. Proc. Linn. Soc., 7: 216 (*Musca*); Walker 1866, J. Proc. Linn. Soc., 9: 22 (*Musca*); Van der Wulp, 1896, Cat. descr. Dipt. S. Asia: 155 (*Musca*); Stein, 1919, Arch. Naturgesch., 83 A 1: 116 (?*Mydaea*); Séguy, 1937, Genera Insect., 205: 284 (*Mydaea)*; Van Emden, 1965, Fauna of India, Muscidae: 39 (*Aubertinella)*; Pont, 1966, Ann. Mag. nat. Hist. (13), 9: 89 *(Myiophaea)*. Syn. nov.
Holotype ♂, MYSOL (= MISOÖL). In the British Museum (Natural History), London. Revid. Pont (l.c.).

= *fulvithorax* Malloch, 1926, Proc. Linn. Soc. N.S.W., 51: 554 (*Gordonia*); Séguy, 1937, Genera Insect., 205: 387 (*Gordonia*); Lee, Crust and Sabrosky, 1955, Proc. Linn. Soc. N.S.W., 80: 318 *(Gordonia)*; Hennig, 1965, Stuttg. Beitr. Naturk., 141: 36 *(Gordonia)*. Syn. nov.
Holotype ♂, QUEENSLAND. In the School of Public Health and Tropical Medicine, Sydney. Revid. Lee, Crust and Sabrosky (l.c.).

= *ralumensis* Enderlein, 1935, Sber. Ges. naturf. Freunde Berl., 1935: 241 *(Myiophaea)*. Syn. nov.
Lectotype ♂, NEW BRITAIN. In the Zoologisches Museum der Humboldt-Universität, Berlin.

[= *fasciata* Macquart, 1843, Mém. Soc. Sci. Lille, 1842: 290, and Pl. 17, fig. 1 (*Ochromyia*), and Dipt. exot., II (3): 133, and Pl. 17, fig. 1 (*Ochromyia*), of authors not of Macquart (misidentifications): Stein, 1918, Annls hist.-nat. Mus. natn. hung., 16: 165 (*Morellia*); Stein, 1919, Arch. Naturgesch., 83 A 1: 108 (*Morellia*); Séguy, 1935, Encycl. ent., B II, Dipt. 8: 110 (*Morellia*); Séguy, 1937, Genera Insect., 205: 393 (*Morellia*); Van Emden, 1965, Fauna of India, Muscidae: 39 *(Aubertinella)*.]

[= *contraria* Walker, 1860, J. Proc. Linn. Soc., 4: 140 (*Aricia*), of Walker, 1864, J. Proc. Linn. Soc., 7: 217 (*Aricia*) not of Walker, 1860 (misidentification).]

Lectotype Designation for *Myiophaea ralumensis.*

Enderlein described *Myiophaea ralumensis* from 1 ♂ and 6 ♀♀ without selecting a holotype. Through the courtesy of Dr. H. Schumann, I have examined all seven syntypes. Enderlein labelled the male and one female "Typus" and the other females "Cotypus". I have labelled and here designate the male as lectotype: it lacks the abdomen, and there is apparently no genital preparation, but otherwise it is in good condition. The remaining six female syntypes have been labelled and are here designated as paralectotypes. 4 of the females are conspecific with the male and with the species under consideration here; one female is a species of *Lasiopelta* Malloch (= *Xenosina* Malloch *nec* Warren), with vein 1 setulose, whilst the other belongs to the group of *Lasiopelta* with vein 1 bare and is probably the same as *Lasiopelta squalens* (Walker).

Notes on Nomenclature.

(1) This species has generally been known as *fasciata* Macquart, with *spissa* Walker placed as a synonym: the references to *spissa* of Stein (1918 and 1919), Séguy (1935 and 1937), and Van Emden (1965) are citations in synonymy. At my request, Dr. L. Tsacas kindly examined the holotype of *Ochromyia fasciata* Macquart, which is preserved in the Museum National d'Histoire Naturelle, Paris, and reported that it possesses a row of hypopleural setae and is evidently a Calliphorid (personal communication, 4.x.1965). Stein (1918) first suggested this synonymy, which he subsequently (1919) followed without question, and I believe that he may have been misled by Wulp's (1896) association of *fasciata* and *spissa* together in *Ochromyia* Macquart and by his own (Stein's) subsequent conclusion, based upon an examination of Walker's

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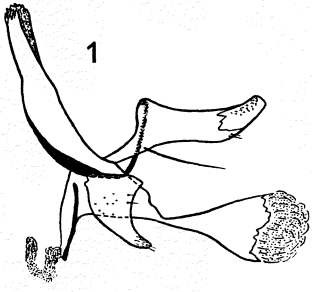
Fig. 1. *Morellia hortorum,* ♂ aedeagus (United Kingdom). Fig. 2. *Rypellia flavipes,* ♂ aedeagus (Assam). Figs. 3-7. *Myiophaea spissa.* (3) ♂ aedeagus; a, from Yalom, distiphallus with juxta not everted; b, from Musgrave River, T.P.N.G., apex of distiphallus with juxta partially everted. (4) Wing-base, ventral surface (♂ from Misoöl). (5) Wing, dorsal surface (♂ from Misoöl). (6) Prosternum (lectotype of *spissa*). (7) Head of ♂, lateral view (lectotype of *spissa*); the dusted occipital band is indicated by stippling.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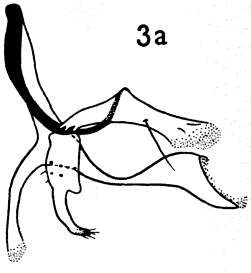
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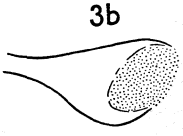
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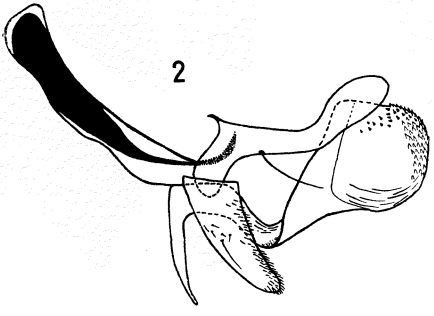
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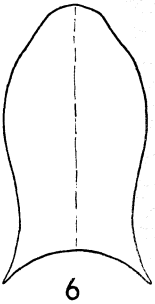
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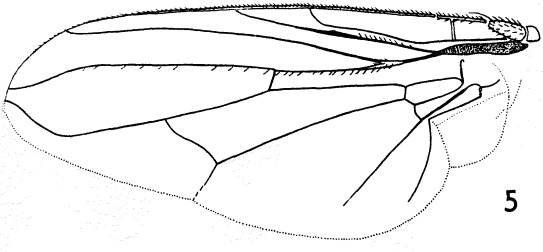
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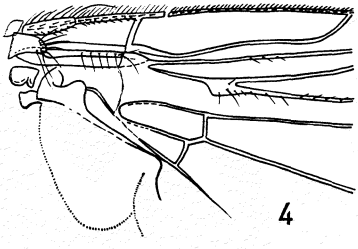
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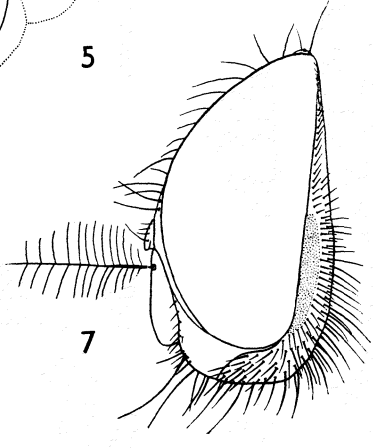
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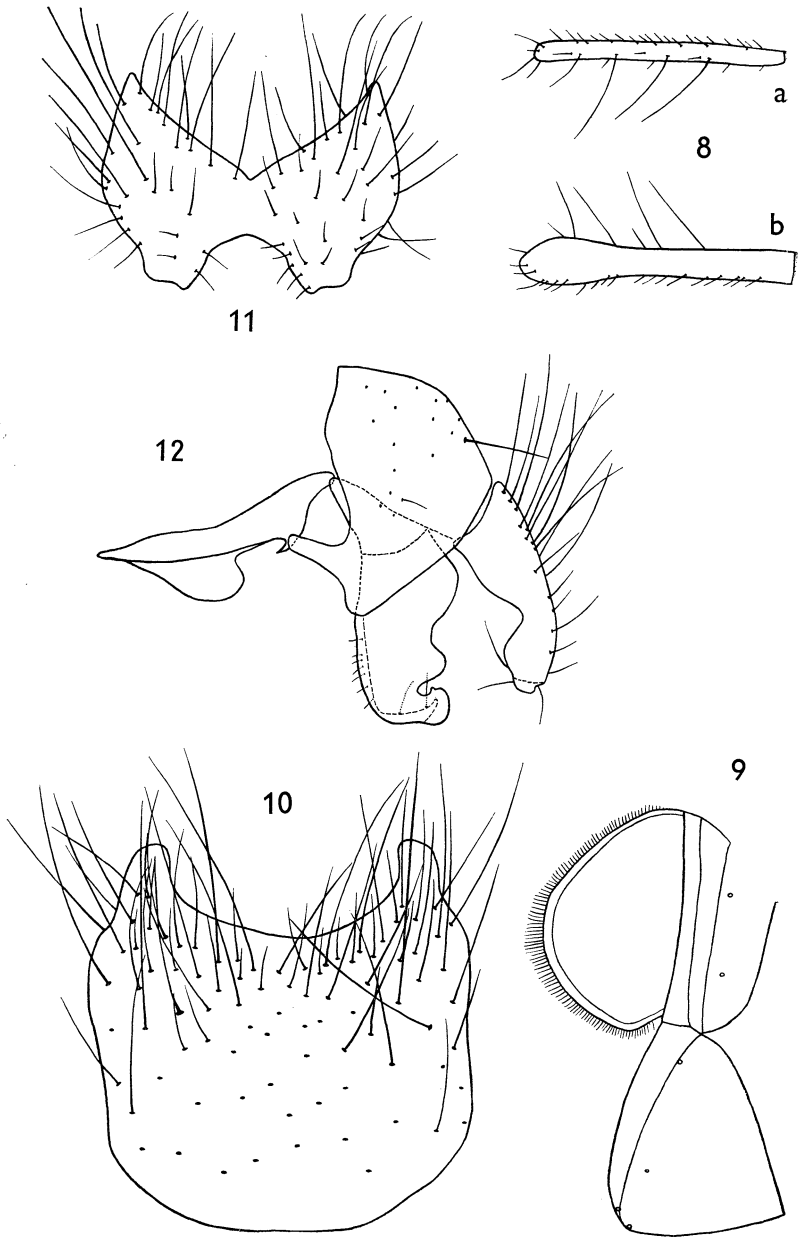
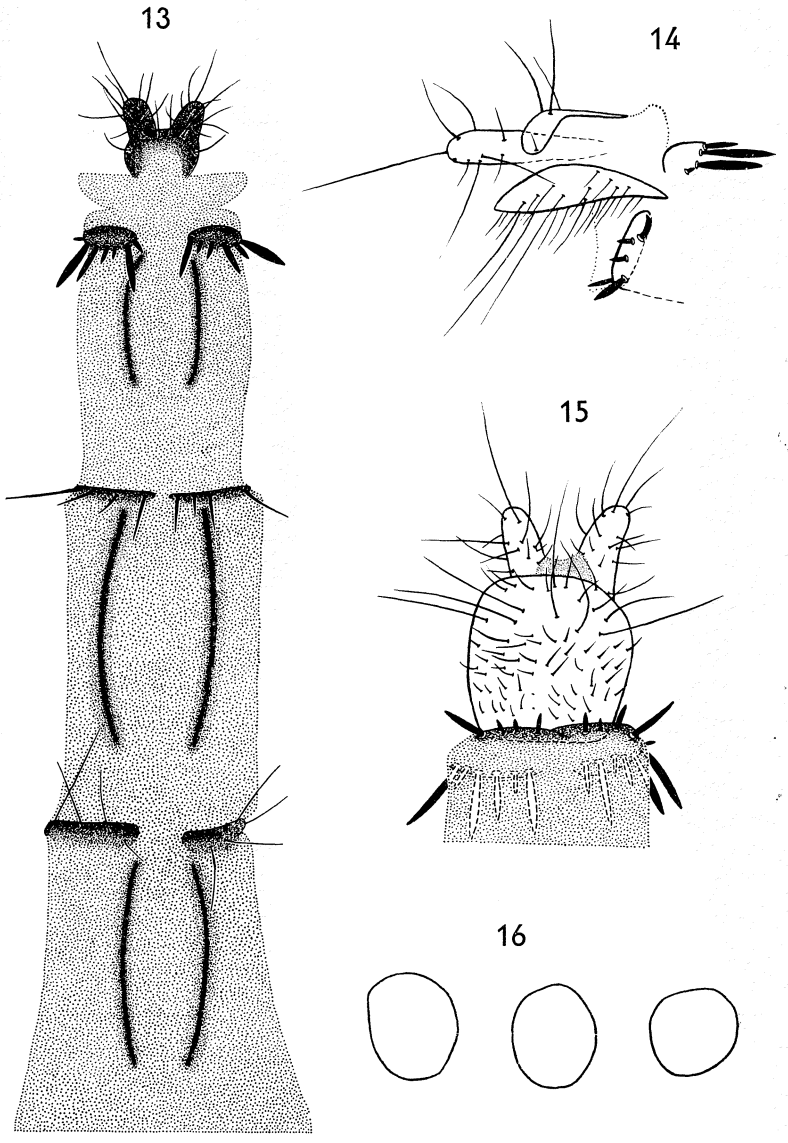


Figs. 8-12, *Myiophaea spissa*. (8) Palpi (♀ from Queensland); a, lateral; b, ventral. (9). Lower squama (♂ from Misoöl). (10) ♂ 5th sternite (paralectotype of *spissa*). (11) ♂ cercal plate, caudal view (paralectotype of *spissa*). (12) ♂ hypopygium, lateral view, aedeagal complex omitted (paralectotype of *spissa*).



Figs. 13-16, *Myiophaea spissa,* ovipositor of a female from Yalom. (13) Dorsal view. (14) Apex, lateral view. (15) Apex, ventral view. (16) Spermathecae.

syntypes (1901), that *spissa* belonged to *Morellia:* he did not examine Macquart's holotype, but Macquart's original description and figure (l.c.) fit *spissa* perfectly. Séguy (1935 and 1937) and Van Emden (1965) followed Stein's synonymy and apparently also omitted to examine the holotype of *fasciata.*

(2) Walker (1864) recorded *Aricia contraria* Walker from Mysol (= Misoöl), but I have examined this specimen, a male, and identify it as *spissa:* it is identical in every detail with the holotype of *Musca aricioides* which Walker described on the previous page (l.c.), and is certainly not conspecific with *contraria* Walker which belongs to the genus *Dichaetomyia* (Van Emden, 1965: 492; Pont, 1966: 90).

Description.

Myiophaea spissa is extremely variable in coloration (cf. the discussion under "Variation" below), but there is such uniformity of structure within the series that I have examined that I regard them all as belonging to a single species. My material at this time has, however, been rather limited. In this description, I am indicating the range of the colour variation, and in the notes below am discussing in more detail the precise colour forms of the material I have examined. Characters mentioned in the generic diagnosis and description are not repeated here.

♂. Head. Frons at narrowest point not as broad as diameter of anterior ocellus. Eyes practically bare, with only the usual sparse microscopic hairs; the upper inner eye-facets conspicuously enlarged. Ocellar setae rudimentary, hair-like. Vertical setae relatively strong and twice as long as the upper post-ocular setulae. Post-ocular setulae, in frontal view, hardly projecting above the eye-margin. Parafacialia and lower parafrontalia silvery-white pruinose, often conspicuously tinged with yellowish, especially in darker specimens; upper parafrontalia subshining, very thinly brown-pruinose. Parafrontalia extremely slender, broadening out at lunula to twice diameter of anterior ocellus. Interfrontalia almost completely obsolete, though a seam divides the parafrontalia for most of their length; reduced to two small triangles at lunula and before ocellar tubercle. 13-15 pairs of *ori* (fig. 7): those on lowest third of parafrontalia inclinate and relatively strong, those on median third short, fine and proclinate, and those on upper third longer, fine and proclinate. *Ors* absent, 1st and 2nd antennal segments yellow to brown, arista brown to black. 3rd antennal

segment very pale yellow to dull yellow; rather slender, just over 4 times as long as broad, in frontal view falling short of epistoma by one-third of its length. Arista with long regular plumosity (fig. 7), the longest of which measures ¾, or is subequal to, length of 3rd antennal segment. Parafacialia bare, slender, opposite insertion of arista equal to almost twice diameter of anterior ocellus (in the lectotype of *spissa*) or to just over diameter of anterior ocellus (in all other material). Vibrissal area rather translucent reddish from some angles, yellowish-grey or grey dusted. The depth below lowest eye-margin greater than width of 3rd antennal segment. In lateral view, parafacialia and part of parafrontalia visible though slender. Conspicuous dark setulae ascending a short distance up facial ridges. Occiput with a conspicuous silvery-white pruinose band along lower half of eye-margin, which was devoid of setulae in all specimens examined except for the paralectotype of *spissa* (fig. 7). Occipital dilation grey-dusted, well delineated, and extending to a short distance before vibrissal angle (fig. 7), densely black setulose. Palpi yellow to black, rather compressed dorso-ventrally and weakly clavate (fig. 8).

Thorax. Ground-colour of mesonotum varying from almost wholly black, with obscure brown translucence laterally, to wholly dull yellow without dark markings or vittae; the basic pattern is yellow with a broad dark median vitta from neck to scutellum that broadens out caudad to include all the space between the *dc* rows and that frequently encroaches upon disc of scutellum. Scutellum varying from wholly black to wholly yellow. The area around *h, ph,* propleuron and mesopleuron always yellow to pale brown beneath the dusting. Pleura varying from yellow to dark brown. Dusting forming a very conspicuous and characteristic pattern: viewed from behind, the black median vitta (or, when absent, the equivalent area) densely whitish dusted before suture, but often tinged more greyish-white, greyish, yellowish-grey or even brownish-white; behind suture, dusting more diffuse and thin, and more brownish tinged than that before suture; in dorso-lateral view, the area between *h,* outer *ph* and suture densely whitish to yellowish or even golden dusted, this dusting extending as a broad band over posterior part of mesopleuron and median third of sternopleuron, to ventral extremity of pleura. The flap-like covering over the opercula of both spiracles yellow to dark brown. All setae and ground-setulae black. *Acr* 0 + 1, though a few *prst* ground-setulae

may be rather stronger; the single (*prsc*) pair strong, placed well in front of, on, or behind the transverse level of *prsc dc* and placed closer to each other than to the *dc*. *Dc* 2 + 4 (—5), only the two posterior pairs really strong, the 2nd (or 3rd) *post* pair half as long as these, the 1st (or first 2) *post* and both *prst* pairs very short but distinct among the ground-setulae. 3 *h*, the outer one strongest; one small male with only 2. 2 *ph*, the posterior one about 1½ times as long as anterior one. 2 *sa*, the posterior one quite well developed. Post-alar callus with 2 setae; with a few setulae extending beyond inner seta, but not actually placed between inner seta and scutellum. Post-alar declivity bare, with a few of the usual soft pale hairs just below the outer seta. 1 propleural seta, with a weaker setula below, and surrounded by several setulae. 1st *npl* slightly longer and stronger than 2nd; disc of notopleuron with several setulae around base of both setae; the Australian ♂♂ are bare around base of anterior seta, some New Guinea ♂♂ have the disc bare of setulae. Mesopleuron with 6 strong setae in caudal row, and one conspicuous black setula in upper anterior corner. Infra-alar bulla yellow to dark brown. Pteropleuron with the setulae extending some way down to upper margin of sternopleuron. *Stpl* 1 + 2, the lower posterior one weakest and very close to upper posterior one. Hypopleuron with a few setulae on lower part of beret and below spiracle, one or both of these groups of setulae sometimes absent; always with more numerous setulae above hind coxa (= pre-episternite III). Metathoracic spiracle large, with several black setulae on posterior margin. Squamopleuron and metanotum bare. Scutellum with a strong apical and sub-basal lateral pair of setae and several strong setulae on lateral part of disc (not true laterals). Disc with dense black setulae that descend at all points on to lateral margins of scutellum but do not invade ventral surface.

Legs. Extremely variable in colour: coxae and trochanters brown to yellow; femora most variable, from black to yellow; knees usually pale; tibiae and tarsi always brown to black. Fore femur without *av* setae, with a complete row of *pv* setae. Fore tibia without submedian setae, the ventral pubescence rather dense and semi-erect in apical half. Mid femur without *av* setae but with the ground-setulae fairly dense and erect in basal part; with several short *pv* setae in basal half, and with 5 short semi-decumbent *p* setae in apical third; 0 *a* and 4—5 *p* to *d* preapical setae, the upper

1—2 *d* weak. Mid tibia with 3—5 *p* setae. Hind femur with 5—7 rather fine *pv* setae in slightly more than basal half; 4—6 similar *av* setae in apical half, basal half of *av* surface with short erect setulae; *ad* row complete; (1—)2—3 *d* and 1 *pd* preapical setae. Hind tibia usually rather noticeably curved, especially in New Britain and Queensland specimens; with a weak *pd* seta at apical two-thirds (= ?calcar), and 4—5 *av* setae; with a complete or almost complete row of short *ad* setae of which 2—3 are much longer and stronger; *d* and *ad* preapical setae both longer than tibial diameter, the former longer than the latter; *pv* apical seta absent.

Wings. Varying from weakly yellowish tinged to conspicuously yellow tinged, especially costally; pale yellow to deep yellow at base; the veins pale to dark. Epaulet brown to black, basicosta yellow to dark brown. Costa setulose ventrally almost to apex of vein 2, the spine inconspicuous. Small cross-vein placed basad of point where vein 1 enters costa. Hind cross-vein sinuate. Vein 1 with several conspicuous black setulae on basal third dorsally, usually bare ventrally but rarely with 1-2 setulae. Squamae and halteres varying from pale yellow, with the lower squama rather dirty on disc, to deep yellow.

Abdomen. Variable in ground-colour: from yellow, with limited dark hind-marginal fasciae on the intermediate tergites, to reddish-brown with very extensive dark brown to black markings; often discoloured by the effect of post-mortal rot. In caudal view without dusting, except for tergite 5 which is conspicuously white dusted on whole surface but for a narrow undusted median vitta. Macrochaetae very poorly developed: tergites 3 and 4 with very weak marginal rows, rather stronger laterally; tergite 5 with 6 erect but weak marginals; without any discal setae.

Hypopygium. Figs. 3 and 10-12.

♀. This sex agrees with the male in all structural characters except for those noted below. The range of colour variation falls within that given for the male.

Head. Frons at middle slightly less than one-third of head-width at this point. Upper inner eye-facets not enlarged. Ocellar setae present and quite well developed, but not long. *Vti* long and strong, reclinate; *vte* very weak, hardly stronger than the post-ocular setulae, directed outwards. *Pvt* well developed, inclinate.

Parafacial and parafrontal dusting tinged with yellowish. Parafrontalia dusted as in male, but upper third undusted, shining black; quite slender, broadening towards lunula where a parafrontale is almost as broad as width of 3rd antennal segment. Interfrontalia rather matt black, reddish above lunula; frontal triangle visible as a weakly shining triangle extending one-third to one-half distance to lunula. 9—12 pairs of quite well developed inclinate *ori,* extending from lunula almost to ocellar tubercle; 2 rather weak reclinate *ors,* the lower one very short, the upper one closer to the lower one than to *vti;* 2—3 proclinate *ors* outside the *ori* on upper half of parafrontalia, and a few other proclinate setulae. Parafacialia broader, opposite insertion of arista equal to twice diameter of anterior ocellus.

Legs. Hind tibia with 2—4 *av* setae; the *pd* weak; *ad* row scarcely developed, with only the two setae.

Ovipositor. Figs. 13—15. Spermathecae (fig. 16) with duct bases not at all developed.

Length. Body: 5.5—7.0 mm. Wing: 5.0—6.5 mm.

Material Examined.

Sack (1914: 62) recorded two specimens of *spissa* from Aru Island, but according to Dr. R. zur Strassen (personal communication, 11.v.1966) these specimens are no longer in the collection of the Senckenbergische Naturforschende Gesellschaft and have probably been destroyed.

The following abbreviations are used:

Brit. Mus. — British Museum (Natural History), London.

D.E.I. — Deutsches Entomologisches Institut, Eberswalde.

Z.M.Berl. — Zoologisches Museum der Humboldt-Universität, Berlin.

Z.M.Cop. — Universitetets Zoologiske Museum, Copenhagen.

QUEENSLAND: 2 ♂, 3 ♀. Kuranda, x.1910 (ex coll. E. Brunetti), 1 ♂, 1 ♀, Brit. Mus.; —, — (ex coll. E. Brunetti), 1 ♀, Brit. Mus.; Kuranda, — (F. P. Dodd), 1 ♀, Brit. Mus.; Kuranda, — (coll. Lichtwardt), 1 ♂, D.E.I.

ARU IS.: 2 ♂. Lectotype ♂ and paralectotype ♂ of *spissa* Walker: ARU IS., —, — (A. R. Wallace), Brit. Mus.

MISOÖL IS.: 3 ♂. Holotype ♂ of *aricioides* Walker: MYSOL (= MISOÖL), —, — (A. R. Wallace), Brit. Mus. MYSOL (= MISOÖL), —, — (A. R. Wallace), 2 ♂, Brit. Mus.; one of these specimens was identified by Walker as *Aricia contraria,* the other

is labelled "Named at sight by P. Stein, W.F.K." and (on reverse) "*Bonellia* [sic] *spissa* Wlk."

WEST IRIAN: 1 ♂, 1 ♀. Humboldt Bay, 200-300 ft., iv.1936 (L. E. Cheesman), 1 ♂, Brit. Mus.; Humboldt Bay, sea level to 300 ft., iv.1936 (L. E. Cheesman), 1 ♀, Brit. Mus.

T.P.N.G.: 3 ♂. Northern District, Kokoda, 1200 ft., on river bank, v.1933 (L. E. Cheesman), 1 ♂, Brit. Mus.; Central District, Musgrave River, 6.v.1965 (R. W. Crosskey), 2 ♂, Brit. Mus.

NEW BRITAIN: 8 ♀, 7 ♀. Lectotype ♂ of *ralumensis* Enderlein: Ralum, 1896-97 (F. Dahl), Z. M. Berl. Paralectotypes, 4 ♀: Ralum, 1896-97 (F. Dahl), 2 ♀, Z. M. Berl.; Ralum, Alovon, auf Pflanzen, 12.x.1896 (F. Dahl), 1 ♀, Z. M. Berl.; Ralum, Alovon, 11.vi.1896 (F. Dahl), 1 ♀, Z. M. Berl. Ralum, Hochwald von Habakaul nach Lamellana*), Ende viii.1896 (F. Dahl), 1 ♂, Z. M. Berl.; Yalom, 1000 m., 8.v.1962 (2 ♂), 15.v.1962 (1 ♂), 17.v.1962 (1 ♂, 3 ♀), and 19.v.1962 (1 ♂) (Noona Dan Exped.), 1 ♂, 1 ♀ in Brit. Mus., others in Z. M. Cop.; Keravat, 19.xi.1957 (J. Smart), 1 ♂, Brit. Mus.

Variation.

As stated at the head of the description, there is considerable colour variation in this species. This variation is probably due to the influence of climate, to the relative humidity of the islands which the species inhabits, and it is possible that the geographical isolation of the different populations will eventually lead to a genetic isolation manifesting itself in morphological differences of a kind not evident at the present time. It would be both premature and impractical to distinguish and name the different populations on colour characters alone, especially as these characters appear to be rather labile within populations and as their evaluation is made difficult by the effect of post-mortal rot on thoracic and abdominal coloration.

The lightest forms occur in Australia: here thorax and abdomen are yellow and almost immaculate, at most with vestigial or rather feeble fasciae and vittae. "Intermediates" occur on Aru and Misoöl Islands, with slightly darker forms in New Guinea: thorax and abdomen yellow to dark yellow, with strong and well-marked dark thoracic vitta and abdominal fasciae. The darkest form is found in New Britain: thorax and abdomen are almost entirely dark brown to black, with only the lateral parts of thorax and the

*) Dr. H. Schumann kindly deciphered this obscure hand-written label.

lateral parts of the anterior abdominal tergites translucent reddish-brown. Antennae, palpi and legs follow the same pattern from yellow to brown or black, and wings and squamae from pale yellow to deep yellow.

I have observed this pattern of variation in colour in several species or species-groups of Australasian Muscidae, particularly in the genus *Dichaetomyia:* Queensland forms tend to be the lightest of all and New Britain ones the darkest, with New Guinea forms falling between the two.

QUEENSLAND. (t.t. of *fulvithorax*). 1st and 2nd antennal segments dark yellow; 3rd segment yellow. Palpi yellow (♂) or dull yellow (♀). Thorax wholly dull yellow to pale brown, without dark markings or vittae. Dusting yellowish-grey before suture, virtually absent behind suture. Covering of opercula yellow. Infra-alar bulla dark yellow. Coxae, trochanters, and femora yellow; tibiae brown; tarsi blackish-brown. Wings weakly yellowish tinged, pale yellow at base, veins pale. Epaulet brown; basicosta yellow. Squamae and halteres yellow (♂) or deep yellow (♀). Abdomen missing in the only male examined; in female dull brownish in ground-colour; tergite 1 + 2 usually immaculate, tergites 3 and 4 with hind-marginal fasciae varying from very slender to rather broad, that on tergite 4 the broadest, tergite 5 immaculate.

ARU IS. (t.t. of *spissa*). 1st and 2nd antennal segments yellow; 3rd segment very pale yellow. Palpi brown, slightly paler at apex. Thorax yellow to dark yellow in ground-colour; mesonotum with a rather broad brown to black median vitta from neck to scutellum that broadens out caudad to include all the space between the *dc* rows. This vitta is densely whitish dusted before suture, very thinly so behind suture where the dusting is more diffuse and tinged with brownish caudad. Covering of opercula dark brown. Infra-alar bulla pale-brown to yellow. Legs mainly dark brown; mid and hind coxae, trochanters, base of femora and knees yellow. Wings weakly yellowish tinged, pale yellow at base, veins pale. Basicosta brown. Squamae and halteres pale yellow, the lower squama rather dirty on disc. Abdomen yellow to dark yellow in ground-colour, with deep brown markings restricted to a narrow hind-marginal fascia on tergite 3 and a broader one on tergite 4.

MISOÖL IS. (t.t. of *aricioides*). 1st and 2nd antennal segments yellow to dark yellow; 3rd segment yellow to very pale yellow.

Palpi wholly brown, or brown and slightly paler towards apex. Mesonotum almost wholly black, slightly paler laterally, or mainly brown with the black vitta very conspicuous and extensive, occupying all the space between the *dc* postsuturally and extending on to scutellum where it occupies most of disc. Humeri, post-humeri and anterior pleural area dark yellow to pale brown, pleura otherwise brown, very much darker ventrad, hypopleuron especially mainly dark brown. Covering of opercula dark brown. Median vitta densely whitish or greyish dusted before suture, more thinly so behind suture where the dusting is more diffuse and is distinctly tinged with brownish. Infra-alar bulla pale-brown to yellow. Legs mainly dark brown; mid and hind coxae, trochanters and base of femora yellow, knees yellow to brown, and fore coxa with a yellow streak on dorsal surface. Wings weakly yellowish tinged, pale yellow at base, veins pale. Basicosta brown. Squamae and halteres pale yellow, the lower squama often rather dirty on disc. Abdomen dull yellow to pale brown in ground-colour, with dark markings as follows: tergite 1 + 2 with or without a narrow hind-marginal fascia; tergite 3 with a broad hind-marginal fascia not occupying half length of tergite; tergite 4 with a very broad hind-marginal fascia that occupies almost the whole of tergite; tergite 5 with or without a median vitta.

NEW GUINEA (West Irian and T.P.N.G.). 1st and 2nd antennal segments pale brown; 3rd segment yellow. Palpi pale to dark brown. Central part of mesonotum (between *dc*) black, brown to dark yellow laterally; humeral and post-humeral area dark yellow; pleura yellow to brown; scutellum deep brown on disc, becoming pale brown laterally, or wholly black. Dusting on mesonotum diffuse and brownish behind suture, more greyish-white or yellowish-grey before suture. Covering of opercula dark brown. Infra-alar bulla yellow (♂) or brown (♀). Legs mainly dark brown; extreme bases or more than basal half of femora, trochanters, sometimes knees, and mid and hind coxae yellowish. Wing-base, squamae and halteres pale to deep yellow. Basicosta dark brown (♂) or brown (♀). Abdomen dirty yellow to pale brown in ground-colour, with extensive black markings: tergite 1 + 2 with a slender hind-marginal fascia; tergite 3 with a broad hind-marginal fascia, occupying about or over half length of tergite; tergite 4 wholly black, except for the lateral anterior corners or for a reddish fascia along anterior margin; tergite 5 mainly to almost wholly black.

NEW BRITAIN. (t.t. of *ralumensis*). 1st and 2nd antennal segments pale brown to brown; 3rd segment dull yellow, usually with some rather diffuse infuscation. Palpi wholly black, sometimes more brownish towards apex. Mesonotum almost wholly black, moderately to very obscurely brown translucent laterally; scutellum mainly or wholly black, some females with the margins paler, brownish; pleura brown to dark brown. The median dusted area of mesonotum conspicuous to comparatively inconspicuous; the dusting brownish-white to rather brownish before suture and brownish behind the suture, and rather diffuse, especially behind suture, better marked and defined in female. Covering of opercula dark brown. Infra-alar bulla brown to dark brown. Legs wholly black; only fore knees, mid and hind coxae, and trochanters brown to dark yellow. Wings rather more conspicuously yellowish tinged costally and deep yellow at base, except in one small male which is pale yellow. Basicosta dark brown. Squamae and halteres deep yellow, except in the small male where they are pale yellow. Abdomen dull yellow to dull reddish-brown in ground-colour, with extensive but rather variable darker markings: tergite 1 + 2 wholly or almost wholly reddish-brown; tergites 3 and 4 with more or less broad black hind-marginal fasciae which vary in width but which sometimes occupy almost all the tergite; tergite 5 wholly reddish-brown to wholly black.

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Summary.

The genus *Myiophaea* is redefined and its systematic position discussed. The type-species, *spissa Walker,* is fully redescribed and illustrated and its variability discussed. Two new generic and three new specific synonymies are established.

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A List of Danish Aphids.

5: From *Brachycolus* Buckton to *Cryptosiphum* Buckton.

By
Ole Heie
Skive Seminarium, Skive.

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List of the species

106. *Brachycolus cerastii* (Kaltenbach, 1846).
107. *B. stellariae* (Hardy, 1850).
108. *Holcaphis frequens* (Walker, 1848).
109. *H. holci* Hille Ris Lambers, 1939.
110. *Hayhurstia atriplicis* (L., 1767).
111. *H. cucubali* (Pass., 1863).
112. *Brevicoryne brassicae* (L., 1758).
113. *Lipaphis erysimi* (Kaltenbach, 1843).
114. *L. rossi* Börner, 1939.
115. *L. turritella* (Wahlgren, 1938).
116. *Semiaphis dauci* (Fabr., 1775).
117. *S. pimpinellae* (Kaltenbach, 1843).
118. *Hyadaphis foeniculi* (Pass., 1860).
119. *Hydaphias hofmanni* Börner, 1950.
120. *Brachycaudus cardui* (L., 1758).
121. *B. helichrysi* (Kaltenbach, 1843).
122. *B. klugkisti* (Börner, 1942).
123. *B. lychnidis* (L., 1758).
124. *B. mimeurii* (Remaudière, 1952).
125. *B. napelli* (Schrk., 1801).

126. *B. prunicola* (Kaltenbach, 1843).
127. *B. spiraeae* (Oestl., 1887).
128. *Dysaphis apiifolia* (Theobald, 1923).
129. *D. crataegi* (Kaltenbach, 1843).
130. *D. radicola* (Mordv., 1897).
131. *D. ranunculi* (Kaltenbach, 1843).
132. *D. tulipae* (B. d. Fronsc., 1841).
133. *D. (Pomaphis) plantaginea* (Pass., 1860).
134. *D. (P.) pyri* (B. d. Fonsc., 1841).
135. *D. (P.) sorbi* (Kaltenbach, 1843).
136. *Anuraphis farfarae* (Koch, 1854).
137. *A. subterranea* (Walker, 1852).
138. *Ceruraphis eriophori* (Walker, 1848).
139. *Acaudinum scabiosae* Hille Ris Lambers, 1959.
140. *Cryptosiphum artemisiae* Buckton, 1879.

Genus **BRACHYCOLUS** Buckton, 1879.

106. *Brachycolus cerastii* (Kaltenbach, 1846).

Brachycolus cerastii Börner, 1952, p. 108, no. 386.

Distribution: Germany, Sweden, France, England, and Denmark.

Occurrence in Denmark: The gall on Cerastium has been found on Sealand at Bodal Mose, on Lolland at Steensgaard, and on Langeland at Tranekjær (Rostrup 1897; Henriksen 1944, p. 99, syn. *Aphis cerastii* Kalt., referring to Ross & Hedicke: Die Pflanzengallen Nord- und Mitteleuropas, Jena 1927, no. 668). Neither the aphids nor the galls have been seen by myself.

The species lives on Cerastium from spring till autumn.

107. *Brachycolus stellariae* (Hardy, 1850).

Brachycolus stellariae Börner, 1952, p. 108, no. 385.

Distribution: Europe. It is known from Sweden and Finland.

Occurrence in Denmark: Collected on Stellaria holostea in Jutland at Krabbesholm Forest at Skive (24-6-58), Mørk Sø south of Skive (18-9-58, oviparae), Buderupholm (19-6-58), Femmøller (4-8-59), and Kås in Salling (13-9-63, ovip. and apt. ♂). Rostrup (1897) recorded it as rather common in Denmark. Henriksen (1944) mentions finds of galls of *Brachycolus stellariae* on Stellaria holostea from Sealand (Holte), Langeland (Vestre Stiktehave), and Jutland (Sæbygaardsskov).

Genus **HOLCAPHIS** Hille Ris Lambers, 1939.

108. *Holcaphis frequens* (Walker, 1848).
Brachycolus frequens Börner, 1952, p. 108, no. 390.

Distribution: Europe, perhaps also North America (if *Aphis tritici* Gill. is a synonym as supposed by Börner). It is known from Sweden and Finland.

Occurrence in Denmark: On Sealand collected on Agropyrum repens at Lyngby (15-7-62). In Jutland collected on Agropyrum repens at Ellidshøj in Himmerland (27-6-59), on grass at Harboøre (25-7-57), on grass at Nørhalne in Vendsyssel (21-7-64), and in a yellow tray at Rønhave on Als (21-6-57).

109. *Holcaphis holci* Hille Ris Lambers, 1939.
Brachycolus holci Börner, 1952, p. 108, no. 387.

Distribution: Germany, Netherlands, England, Austria, Poland, Sweden, and Denmark.

Occurrence in Denmark: Collected on grass in Jutland at Skals (26-6-57), Vodskov near Nørresundby (18-8-62), and Skive (6-7-63). Holcus is the only host.

Genus **HAYHURSTIA** Del Guerc., 1917.

110. *Hayhurstia atriplicis* (L., 1767).
Hayhurstia atriplicis Börner, 1952, p. 109, no. 396.

Distribution: Europe, Asia, North America. It is known from Sweden and Finland.

Occurrence in Denmark: Common all over the country. Collected or observed by the writer on the following hosts and localities:

Jutland: On Chenopodium album at Tylstrup (11-8-56), V. Hjermitslev (2-8-60), Hirtshals (26-7-60, 27-7-64), Blokhus (June 60, 18-8-63), St. Vildmose (3-8-60), Roslev (29-6-60), Skive (1-9-57, 17-7-59), Studsgård (13-7-60), Femmøller (3-8-59), and Fuglsø (14-9-62), and on Atriplex litoralis at Femmøller (6-7-60), Hirtshals (26-7-60), and Trend (9-6-66).

The Danish islands: On Chenopodium album on Læsø (6-8-57), at Dyreborg on Funen (15-7-57), and at Lillebrænde on Falster (16-8-57), on Atriplex litoralis on Strynø (7-7-57), Ærø (9-7-57), Avernakø (11-7-57), at Bøjden on Funen (14-7-57), at Kerteminde on Funen (7-7-58), and at Ballen on Samsø (10-8-58), and on

Atriplex hastata on Strynø (7-7-57), at Kerteminde (7-7-58) and Nyborg on Funen (9-7-58), and at Onsbjerg on Samsø (12-8-58).

In 1956 it was among the most numerous aphid species in yellow Moericke-trays at Ørslev on Sealand, Årslev on Funen, and Tylstrup, Borris, and Jyndevad in Jutland from June till September (Heie 1960 b).

The galls on Chenopodium glaucum, Ch. album, Atriplex patula, A. hastata, A. litoralis, and A. sp. are recorded by Henriksen (1944, p. 97—98) from Jutland (Sæby, Aalborg, Viborg), Fanø, Sealand (Ordrup, Tisvilde, Vemmetofte), Amager, and Bornholm (Gudhjem).

The species feeds on Chenopodium or Atriplex from spring till autumn, causing thickening and fading of the leaves, whose margins fold upwards along the mid rib into a pod-like shape, so the powdered aphids are completely concealed.

111. *Hayhurstia cucubali* (Pass., 1863).

Hayhurstia cadiva (Walker) Börner 1952, p. 109, no. 397.

Distribution: Europe. It is known from Sweden and Finland.

Occurrence in Denmark: Henriksen (1944, p. 100) records the gall of *Aphis cucubali* Pass. on Silene vulgaris (= S. inflata = S. cucubalus) and S. nutans from Bornholm (Rønne, Nylarsker) and Sealand (Fårevejle, Nykøbing, Sejrø, Slagelse, Alindemagle). It has not been seen by the writer.

Genus **BREVICORYNE** v. d. Goot, 1915.

112. *Brevicoryne brassicae* (L., 1758).

Brevicoryne brassicae Börner, 1952, p. 110, no. 400.

Distribution: All parts of the world. It is known from Iceland, Sweden, Norway, and Finland.

Occurrence in Denmark: Common all over the country. Collected or observed on Sealand on Brassica in Copenhagen (17-8-17, M. Thomsen leg.) and in yellow Moericke-tray at Ørslev (1956), on Funen in a tray at Årslev (1956), in Jutland on cultivated Brassica oleracea at Skive (7-9-58, 19-9-58), Ø. Lyby, Salling (29-7-59), and Kjellerup (31-7-59), on B. napus rapifera (swedes) at Handbjerg near Struer (16-7-59), Hune in Vendsyssel (23-7-59), Vile and Åsted in Salling (26-7-59), Dalgas Plantation

(27-7-59), Ørum near Viborg (3-8-59), Aggersund (27-7-59), Ranum (27-7-59), and Rye near Silkeborg (21-7-59), on Brassica spp. at Femmøller, Mols (3-8-59) and Rønhave, Als (27-7-56), on Raphanus raphanistrum at Femmøller (6-7-60), on Cakile maritima at Ebeltoft (15-9-62, only 1 alate ♂), and in yellow trays at Borris (24-8-56) and Jyndevad (from July to September, 1956).

It is a well-known pest to kale, cauliflower, white and red cabbage, swedes, and other crucifers and may also occur on Tropaeolum and some other plants. Several Danish publications treat this species: Rostrup 1897, 1900; Thomsen & Bovien 1933; Stapel & Bovien 1943; Gram & Bovien 1944; Henriksen 1944; Heie 1961 b; several publications from the Danish State Experimental Station for Plant Diseases and Pests. The Danish name is "kålbladlus" or "kållus". Severe attacks on swedes occurred in 1921, 1934, 1948, and 1959.

Genus **LIPAPHIS** Mordv., 1928.

113. *Lipaphis erysimi* (Kaltenbach, 1843).

Lipaphis erysimi Börner, 1952, p. 110, no. 403.

Distribution: Nearly all over the world (syn. *Rhopalosiphum pseudobrassicae* Dav.). It is known from Sweden and Finland.

Occurrence in Denmark: On Sealand collected on Sinapis alba at Lyngby (6-8-42). In Jutland collected on Sisymbrium officinale at Ribe (2-7-58), Lundø near Skive (7-7-59), and Hune in Vendsyssel (7-8-63), on Capsella bursa-pastoris at Ellidshøj (27-6-59), Hirtshals (26-7-60), and Lundø (7-7-59), on Thlaspi arvense at Ø. Lyby in Salling (29-7-59), on Brassica napus rapifera (swedes) at Aså (8-7-59), Hune (23-7-59), Åsted in Salling (26-7-59), Ø. Lyby (29-7-59), Handbjerg near Struer (16-7-59), and Låsby (21-7-59), and on Brassica oleracea at Ø. Lyby (29-7-59); furthermore it has been observed on Capsella bursa-pastoris at Vodskov (18-8-62) and Glyngøre (10-7-59), on Sisymbrium officinale at Glyngøre (10-7-59), and on Brassica napus rapifera at Dalgas Plantation between Skive and Viborg (27-7-59), Dølby in Salling (29-7-59), and Rye near Silkeborg (21-7-59). Its occurrence in Denmark, especially on swedes, has been treated in an earlier paper (Heie 1961 b), where also the possible synonymy with *Rhopalosiphum pseudobrassicae* Dav. is discussed. On swedes its

feeding may cause purple-colouring of the inner leaves. It seems to be common in some years, for instance in 1959.

In 1956 it was caught in Moericke-trays, several specimens at Ørslev on Sealand, a few at Årslev on Funen, and Tylstrup, Borris, and Jyndevad in Jutland (Heie 1960 b).

114. *Lipaphis rossi* Börner, 1939.

Lipaphis (Smiela) rossi Börner, 1952, p. 111, no. 407.

Distribution: Germany, Sweden, and Denmark.

Occurrence in Denmark: Recorded as "Aphidae sp." from Arabis hirsuta at Jonstrup on Sealand (30-6-1896, Hj. Jensen) in Henriksen (1944, p. 103). This aphid must be identical with *L. rossi,* as Henriksen gives a reference to Ross & Hedicke: Die Pflanzengallen Nord- und Mitteleuropas (Jena 1927), no. 259, which according to Börner (1952) refers to *Lipaphis rossi* Börner. It has not been seen by the writer.

115. *Lipaphis turritella* (Wahlgren, 1938).

Lipaphis (Smiela) turritella Börner, 1952, p. 111, no. 408.

Distribution: Sweden, Germany, Austria, Czecho-Slovakia, Finland, and Denmark.

Occurrence in Denmark: Recorded as "Aphidae sp." from Turritis glabra at Folehaveskov (July, 1855, E. Rostrup) and Holstensborg (19-6-1892, S. Rostrup), both on Sealand, by Rostrup (1897) and Henriksen (1944, p. 103). This aphid must be identical with *L. turritella,* as Henriksen gives a reference to Ross & Hedicke (1927), no. 2834, which according to Börner (1952) refers to *Lipaphis turritella* Wahlgr. It has not been seen by the writer.

Genus **SEMIAPHIS** v. d. Goot, 1913.

116. *Semiaphis dauci* (Fabr., 1775).

Semiaphis dauci Börner, 1952, p. 112, no. 411.

Distribution: Germany, Poland, and Denmark.

Occurrence in Denmark: Found on Daucus carota at Lyngby on Sealand (30-7-58, J. Jørgensen coll.).

117. *Semiaphis pimpinellae* (Kalt., 1843).

Semiaphis pimpinellae Börner, 1952, p. 112, no. 413.

Distribution: Europe.

Occurrence in Denmark: Recorded from Pimpinella

saxifraga on Sealand at Tisvilde (9-8-1894, 2-5-1895) and in Jutland at Sæby by Rostrup (1897). The record from Tisvilde is mentioned again by Henriksen (1944, p. 145—146). Both authors use the name *Aphis anthrisci* Kalt., but *Semiaphis anthrisci* lives on Torilis only. I believe that it really is *S. pimpinellae,* because the gall, which is described as a curling of the leaflets from the side, is identified with no. 1775 in Ross & Hedicke (1927), which according to Börner (1952) is caused by this species.

Genus **HYADAPHIS** Kirk., 1904.

118. *Hyadaphis foeniculi* (Pass., 1860).
Hyadaphis mellifera (Hottes) Börner, 1952, p. 113, no. 419.
Hyadaphis passerinii (Del Guerc.) Börner, 1952, p. 114, no. 420.

Distribution: Europe, Asia, North America, and Australia. It is known from Sweden and Finland.

Occurrence in Denmark: On Funen collected on Lonicera periclymenum at Bovense near Nyborg (9-7-58). In Jutland collected on Lonicera sp. at Skive (22-9-62, 7-6-63, 4-7-63, 14-7-63), on Anthriscus silvestris in Krabbesholm Forest at Skive (25-7-58), on Pimpinella saxifraga at Femmøller, Mols (8-9-60) and Jetsmark in Vendsyssel (26-7-64), and on Daucus carota at Kalø (29-8-62).

Hyadaphis xylostei Schrk. in Henriksen (1944, p. 108—109) recorded from Lonicera periclymenum and L. xylosteum from several localities on Bornholm, Sealand, Lolland, Langeland, Funen, and in Jutland is probably the same species.

The species migrates from Lonicera to Umbelliferae.

Genus **HYDAPHIAS** Börner, 1930.

119. *Hydaphias hofmanni* Börner, 1950.
Hydaphias hofmanni Börner, 1952, p. 114, no. 422.

Distribution: Europe. It is known from Sweden and Finland.

Occurrence in Denmark: Recorded as *Aphis bicolor,* which is a synonym, from Galium verum at Rønne and Helligdommen on Bornholm (Bayer) and Tisvilde (2-6-1895, S. Rostrup) and Vemmetofte (1897, R. H. Stamm) on Sealand by Henriksen (1944, p. 165—166), with reference to no. 1141 in Ross & Hedicke (1927), and from Sæby in Jutland by Rostrup (1897). It has not been seen in Denmark by the writer.

Genus **BRACHYCAUDUS** v. d. Goot, 1913.

120. *Brachycaudus cardui* (L., 1758).

Brachycaudus cardui Börner, 1952, p. 104, no. 374.

Distribution: Europe, Asia, and North America. It is known from Sweden, Finland, and Norway.

Occurrence in Denmark: Found in all parts of the country, rather common. On Sealand collected on Prunus fruticans in Copenhagen (6-6-52), P. cerasifera in Copenhagen (3-5-53, Børge Petersen coll., Hille Ris Lambers det.), Cirsium palustre in Malmmose at Holte (3-7-50, 16-8-58), Senecio vulgaris and — accidentally — Fragaria (only one alata) at Lyngby (3-7-58); indoors collected on Echium candicans and observed on Echium bifrons in the Botanical Garden in Copenhagen (16-4-59); furthermore caught in a Moericke-tray at Ørslev (27-7-56). On Funen collected on Arctium at Fåborg (13-7-57) and at Årup (6-7-58) and observed on Matricaria at Nyborg (9-7-58). On other islands collected on Matricaria inodora at Vindeby on Tåsinge (3-7-57), on Myosotis on Turø (4-7-57), on Arctium, Carduus crispus, and Matricaria inodora at Rudkøbing on Langeland (5-7-57, 6-7-57), on Cirsium vulgare on Ærø (8-7-57), and on Anchusa officinalis north of Ballen on Samsø (10-8-58). In Jutland collected on Senecio vulgaris at Hirtshals (26-7-60), on Anchusa officinalis at Ellidshøj (27-6-59), on Cirsium palustre at Skive (1-9-56), on Anthemis arvensis at Femmøller, Mols (3-8-59), and on Cirsium vulgare on Rømø (5-7-58).

Its occurrence on plum trees is mentioned by Bovien & Thomsen (1945). It migrates from Prunus spp. to several herbs, chiefly belonging in Compositae and Boraginaceae.

121. *Brachycaudus helichrysi* (Kaltenbach, 1843).

Brachycaudus helichrysi Börner, 1952, p. 106, no. 379.

Distribution: Europe, Asia, Africa, and Australia. It is known from Sweden, Norway, and Finland.

Occurrence in Denmark: Found in all parts of Denmark, common. On Sealand collected on Artemisia maritima at Dragør (19-10-57), and on Trifolium pratense at Hårlev (August 1932), Lyngby (29-6-59, July 1961, C. Stapel coll.), Tåstrup (16-9-59, C. Stapel coll.), Kollekolle (10-9-59, C. S. coll.), near Hillerød (26-7-61, C. S. coll.), and Ringsted (18-9-62, C. S. coll.), and indoors on Chrysanthemum in Copenhagen (16-2-51); on Sealand

the species has furthermore been observed at Holte, Næstved, and Vordingborg. On Funen collected on Myosotis arvensis and Achillea millefolium at Svanninge Bakker (12-7-57), on Matricaria inodora near Fåborg (13-7-57), and on Matricaria matricarioides at Nyborg (8-7-58). On Bornholm collected on Trifolium pratense at V. Marie (13-7-63, C. Stapel coll.). On other islands collected on Veronica sp. at Arninge on Lolland (16-8-57), on Matricaria inodora and Prunus spinosa on Turø (2-7-57, 4-7-57), on Tanacetum vulgare on Strynø (7-7-57), on Anchusa officinalis at Hårdmark on Samsø (12-8-58), on Tanacetum vulgare at Langør on Samsø (13-8-58), and indoors on Cineraria at Sdr. Alslev on Falster (6-4-55, Børge Petersen coll.); it has furthermore been observed on Tåsinge, Ærø, Avernakø, and Lyø. In Jutland collected on Prunus spinosa at Højris on Mors (10-7-60), on Achillea millefolium at Resen near Skive (18-7-57), and at Rimmer Strand near Lemvig (25-7-57), on Myosotis sp. at Resen near Skive (18-7-57) and in Skive (27-7-57), on Veronica sp. at Dølby near Skive (19-7-57), on Veronica agrestis at Lemvig (4-7-59), on Senecio vulgaris at Rønbjerg near Skive (22-7-57), on Fur (22-8-57), and at Hirtshals (26-7-60), on Gnaphalium silvaticum at Harboøre (25-7-57), on Symphytum at Skive (27-7-57) and at Studsgård (9-7-59), on Stellaria media west of Skive (28-9-57), on Matricaria maritima at Bovbjerg (8-10-57) and on M. inodora at Hirtshals (26-7-60) and at Vodskov (18-8-62), on Bidens at Nr. Vinge at Tjele Langsø (13-7-59), on Glaux maritima (only a single alata; this is not a host) and Aster tripolium at Mellerup (13-7-59), on Trifolium pratense in Thy (17-8-59), at Demstrup near Kjellerup (2-9-59), at Skanderborg (3-9-59), at Ørslevkloster (13-9-59), Tastum near Skive (26-9-59), Fovslet near Kolding (29-9-59, Ruby coll.), Simmelkjær (1-10-59), Skive (23-6-60), and Balle near Silkeborg (12-7-60); the species has been observed on various hosts at several other localities in Jutland: Hvidsten, Strandkjær at Femmøller, Ejer Bavnehøj, Herrup at Hagebro, Vinderup, Handbjerg, Sundsøre, and Oddense in Salling; indoors in Jutland collected on Chrysanthemum at Vinde near Skive (10-1-57) and at Skive (12-1-57, 18-2-60).

This species has furthermore been caught in yellow Moericke-trays at Ørslev on Sealand, Årslev on Funen, Borris, Tylstrup, and Jyndevad in Jutland, and Rønhave on Als.

Its occurrence in Denmark has been known for many years.

It is mentioned as a pest to plum trees by Ferdinandsen & Rostrup (1921) and Bovien & Thomsen (1945) and as a pest to red clover by Bovien (1935, in "Månedsoversigter over Plantesygdomme (Statens plantepatologiske Forsøg)") and by Heie & Stapel (1964). It is also a pest to Chrysanthemum, Cineraria, and other ornamental plants in glass houses. It migrates from Prunus (domestica, insititia, spinosa) to various herbs, mostly composites. In hothouses propagation can continue parthenogenetically on herbs all winter.

122. *Brachycaudus klugkisti* (Börner, 1942).
Brachycaudus klugkisti Börner, 1952, p. 103, no. 372.

Distribution: Germany, Austria, Poland, Belgium, England, Sweden, Finland, and Denmark.

Occurrence in Denmark: Collected on Melandrium rubrum in Jutland in Krabbesholm Forest at Skive (20-6-57, 20-5-59, 31-5-61), at Toftum Bjerge near Struer (24-6-57), and at Avnsbjerg (13-8-59). The species lives exclusively on Melandrium rubrum.

123. *Brachycaudus lychnidis* (L., 1758).
Brachycaudus lychnidis Börner, 1952, p. 103, no. 371.

Distribution: Europe. It is known from Sweden and Finland.

Occurrence in Denmark: Collected on Melandrium album on Funen at Tybrind (30-5-57), in Jutland at Rindsholm near Viborg (16-7-56), Skive (4-8-58), St. Vildmose (3-8-60), Femmøller (4-7-60), and Fuglsø (14-9-62). It has furthermore been observed on Funen at Horne (14-7-57) and Dyreborg (15-7-57). The species lives exclusively on Melandrium album.

124. *Brachycaudus mimeurii* Remaudière, 1952.
Brachycaudus mimeurii Börner, 1952, p. 304, no. 373 e.

Distribution: France, Denmark.

Occurrence in Denmark: Collected on Euphrasia officinalis at Boderne on Bornholm (2-9-65, J. Reitzel leg., D. Hille Ris Lambers det.).

125. *Brachycaudus napelli* (Schrk., 1801).
Brachycaudina napelli Börner, 1952, p. 103, no. 370.

Distribution: Europe. It is known from Sweden, Norway, and Finland.

Occurrence in Denmark: On Sealand observed at Charlottenlund in the Copenhagen area (8-7-50) and collected at Roskilde (2-8-64, J. Reitzel leg.), both times on Aconitum napellus. These records have been published already by Reitzel (1965).

126. *Brachycaudus prunicola* (Kaltenbach, 1843).

Appelia tragopogonis (Kalt., 1843) Börner, 1952, p. 107, no. 382.
Appelia prunicola Börner, 1952, p. 107, no. 383.
Appelia schwartzi (Börner, 1931) Börner, 1952, p. 107, no. 384.
Brachycaudus prunicola s.lat. Thomas, 1962, p. 325 ff.

Distribution: Europe. It is known from Sweden.

Occurrence in Denmark: *B. prunicola* s. str. collected on Prunus spinosa on Funen at Fåborg (12-7-57), Holckenhavn (8-7-58), and Hesselager (8-7-58). The aphids cause strong curling of the leaves.

B. prunicola subsp. *schwartzi* Börner collected on Prunus persica on Sealand in Copenhagen (22-10-52, Børge Petersen coll.) and indoors at Virum (5-4-50). The aphids cause curling of the leaves. *Anuraphis persicae* B.d.F., which is a synonym, is mentioned as a pest to peach trees by Bovien & Thomsen (1945).

B. prunicola subsp. *tragopogonis* Kalt. collected on Tragopogon pratensis on Funen at Horne (14-7-57) and east of Bjerne (14-7-57, only observed), on Turø (4-7-57), and in East Jutland at Kolding (5-7-58), Rude Strand near Odder (3-6-64), and Boller near Horsens (28-6-59, only observed).

127. *Brachycaudus spiraeae* (Oestl., 1887).

Brachycaudus spiraeae Börner, 1952, p. 105, no. 377.

Distribution: Holarctic. It is known from Sweden, Norway, and Finland.

Occurrence in Denmark: On Sealand collected on Spiraea salicifolia at Luknam, Holte (16-8-58). In Jutland collected on Spiraea salicifolia at Holstebro (1-7-59) and Fosdalen in Han Herred (5-8-63). The aphids cause narrow leaf rolls in which they live concealed. Possibly some galls on Spiraea mentioned by Henriksen (1944, p. 109) belong to this species, viz. no. 287: "*Macrosiphum ulmariae* Schr.? Jutland, Fanø. Dense gathering of leaves irregularly rolled towards the underside" and no. 288: "Aphidae sp. (an *Macrosiphum ulmariae* Schr.). Sealand, Ørholm; Jutland, Viborg. The leaves curled and rolled towards the

underside" (translated by the writer). The last-mentioned locality is already recorded by Rostrup (1897), who says that the leaves of Spiraea salicifolia are irregularly curled and folded. Neither *Macrosiphum cholodkovskyi* Mordv. nor *Aphis ulmariae* Schrk. does live on Spiraea. Both feed on Ulmaria palustris.

Genus **DYSAPHIS** Börner, 1931.

Subgenus **DYSAPHIS** s. str.

128. *Dysaphis apiifolia* (Theobald, 1923).

Yezabura kunzei Börner, 1952, part., p. 102, no. 367.
Yezabura inculta (Walk.) Börner, 1952, p. 103, no. 369.
Dysaphis apiifolia Stroyan, 1963, p. 38.

Distribution: Europe. It is not recorded from Sweden.

Occurrence in Denmark: Collected in Jutland at Studsgård (13-7-60) on Apium graveolens (celery), Anethum graveolens (dill), and Petroselinum crispum.

Attack of aphids on celery at Blangsted on Funen in July, 1927, is recorded by Gram, Jørgensen & Rostrup (1928, p. 806); the aphids were not determined, but probably belonged in this species, too. A sample of *Dysaphis apiifolia,* the label of which is left without locality, dated "1927?", which has been found in the collection of the State Experimental Station for Plant Diseases and Pests, perhaps derives from this attack.

The Danish material belongs to subspecies *petroselini* Börner sensu Stroyan. According to Stroyan it migrates from Crataegus to Umbelliferae.

129. *Dysaphis crataegi* (Kaltenbach, 1843).

Yezabura crataegi Börner, 1952, p. 102, no. 368.
Dysaphis crataegi Stroyan, 1963, p. 31.

Distribution: Europe, Israel, Central Asia, North America. It is known from Norway, Finland, and Sweden.

Occurrence in Denmark: Collected on Daucus carota on Sealand at Lyngby (27-6-58, 11-6-59, 15-7-60, 12-9-60) and in Jutland at Studsgård (13-7-60). It feeds on the root. Aphids on carrot roots mentioned by Bovien & Thomsen (1945) must be this species. Bovien (1939, in "Plantesygdomme i Danmark 1938", p. 40) reported that *Anuraphis tulipae* had been found on roots of carrots in the Århus area. This must also have been *Dysaphis crataegi,* as the related species *tulipae* does not live on Daucus.

The species migrates from Crataegus to Daucus.

130. *Dysaphis radicola* (Mordv., 1897).
Dysaphis radicola Börner, 1952, p. 99, no. 350 a.
Dysaphis radicola Stroyan, 1963, p. 14.

Distribution: U.S.S.R., Poland, England, France, Netherlands, Germany, Switzerland, and Denmark.

Occurrence in Denmark: Collected on Sealand at Islev in Copenhagen on Rumex crispus by J. Reitzel (5-7-64). The species lives all the year round on the roots of Rumex.

131. *Dysaphis ranunculi* (Kaltenbach, 1843).
Yezabura ranunculi Börner, 1952, p. 102, no. 365.
Dysaphis ranunculi Stroyan, 1963, p. 41.

Distribution: Germany, England, Belgium, Netherlands, Austria, Italy, U.S.S.R., Central Asia, Sweden, Finland, and Denmark.

Occurrence in Denmark: Trapped in a yellow Moericke-tray on Sealand at Lyngby (14-6-58). Dr. V. F. Eastop, London, most kindly made the determination.

The species migrates from Crataegus to Ranunculus.

132. *Dysaphis tulipae* (B. d. Fonsc., 1841).
Yezabura tulipae Börner, 1952, p. 101, no. 360.
Dysaphis tulipae Stroyan, 1963, p. 43.

Distribution: Europe, Africa, North America, Australia, and New Zealand. It is known from Sweden (but only on tulip bulbs imported from the Netherlands).

Occurrence in Denmark: Collected on bulbs of Tulipa on Sealand at Roskilde (22-11-30; the State Experimental Station for Plant Diseases and Pests). The species is said to live all the year round on monocotyledoneous plants, e. g. Tulipa, Gladiolus, Lilium, and Iris, without forming sexuales.

Subgenus **POMAPHIS** Börner, 1936.

133. *Dysaphis (Pomaphis) plantaginea* (Pass., 1860).
Sappaphis mali (Ferrari) Börner, 1952, p. 98, no. 342.
Sappaphis plantaginea Stroyan, 1957, p. 24.

Distribution: Europe, Asia, North America. It is known from Sweden, Norway, and Finland.

Occurrence in Denmark: On Funen collected by sweeping at Glamsbjerg (6-7-58, 2 al.). On Langeland collected on Pyrus malus (apple) at Rudkøbing (5-7-57). In Jutland col-

lected on apple on Rømø (5-7-58), at Femmøller, Mols (6-7-60), Lemvig (4-7-59), and Estvad near Skive (17-6-59), and on Plantago lanceolata at Tulstrup near Silkeborg (21-7-59) and Brund near Horsens (28-6-59).

It is rather common in Denmark (Danish name: "Den røde æblebladlus") according to Henriksen (1944, syn. *Anuraphis sorbi* Kalt. partim), Bovien & Thomsen (1945, syn. *Dentatus malifolii)* and "Plantesygdomme i Danmark" (syn. *Yezabura malifolii).* It is a pest to apple, the leaves of which are curled. Plantago is the summer host.

134. *Dysaphis (Pomaphis) pyri* (B. d. Fonsc., 1841).
Sappaphis piri (Matsumura) Börner, 1952, p. 98, no. 344.
Sappaphis pyri Stroyan, 1957, p. 17.

Distribution: Europe and Asia. It is known from Sweden.

Occurrence in Denmark: Collected on Sealand on Pyrus communis (pear) at Lyngby (20-6-44; 6-8-64, J. Reitzel leg.). At the State Experimental Station for Plant Diseases and Pests, Lyngby, attacks on pear and migration from pear to Galium aparine have been observed according to Bovien (1950, p.41, syn. *Yezabura pyri,* Danish name: "Den røde pærebladlus").

135. *Dysaphis (Pomaphis) sorbi* (Kaltenbach, 1843).
Sappaphis sorbi Börner, 1952, p. 97, no. 338.
Sappaphis sorbi Stroyan, 1957, p. 29.
Dysaphis (Pomaphis) sorbi Stroyan, 1963, p. 54.

Distribution: Europe. It is known from Sweden, Norway, and Finland.

Occurrence in Denmark: A common species. Collected or observed on Sorbus aucuparia on Sealand at Bagsværd (15-4-59, coll.), on Funen at Hylkedam (28-5-57, coll.), on Læsø at Hventgård (7-8-57, coll.), and in Jutland at V. Hjermitslev (2-8-60, coll.), Hammer Bakker (29-7-64), Legind Bjerge on Mors (30-5-60, coll.), south of Skive (1-8-58, coll.), Flyndersø (21-5-59, coll.), Kjellerup (13-8-59), Madum Sø in Himmerland (9-6-58, coll., 2-9-58, coll., 13-9-60, coll., 18-5-61, 31-5-62), Hvalpsund (27-8-66), and Femmøller, Mols (7-8-59, coll., 6-7-60).

The typical leaf galls or nests are recorded by Rostrup (1897), who says that the aphid is common in Denmark, and by Hendriksen (1944, p. 123). According to Stroyan (1957) a closed cycle on Sorbus aucuparia exists, though migration to Campanula and

Jasione may take place in summer. Gynoparae on Sorbus may come either from Sorbus or from Campanulaceae, but males apparently derive from Campanulaceae only. I have found the aphids only on Sorbus aucuparia, even as late as in the beginning of September. The leafnests are often, but not always, empty in the last part of the summer. Oviparous females were found on September 13, 1960, at Madum Lake on undersides of fresh, not deformed leaves.

Genus **ANURAPHIS** Del Guerc., 1907.

136. *Anuraphis farfarae* (Koch, 1854).

Anuraphis farfarae Börner, 1952, p. 99, no. 347.

Distribution: Eurasia and North America. It is known from Sweden and Finland.

Occurrence in Denmark: On Sealand collected on Fragaria (not a host) under a pear tree at Holte (24-10-58, ovip.) and caught in a Moericke-tray at Ørslev (June and July, 1956). On Funen caught in a Moericke-tray at Årslev (June and July, 1956). In Jutland collected on Tussilago farfara at Skive (30-7-58, 4-8-58). Pear is the winter host, where galls are produced in spring. In the summer the species lives on Tussilago below the surface of the soil.

137. *Anuraphis subterranea* (Walker, 1852).

Anuraphis subterranea Börner, 1952, p. 99, no. 348.

Distribution: Europe. It is known from Sweden.

Occurrence in Denmark: In Jutland collected on Pastinaca sativa at Hammer Bakker in Vendsyssel (14-8-63). According to Börner it migrates from pear to Pastinaca sativa and Heracleum sphondylium.

Genus CERUAPHIS Börner, 1926.

138. *Ceruraphis eriophori* (Walker, 1848).

Ceruraphis eriophori Börner, 1952, p. 96, no. 335.

Distribution: Europe. It is known from Sweden and Finland.

Occurrence in Denmark: On Sealand collected on Viburnum opulus at Lyngby (17-10-60), Sorgenfri (8-7-57, B. Petersen leg.), and Holte (17-10-57). On Falster collected on Viburnum opulus at Nr. Alslev (3-7-57, B. Petersen leg.). In Jut-

land caught in a Moericke-tray at Borris (28-9-56), by sweeping in a bog with Eriophorum at Femmøller, Mols (8-8-59), and on Viburnum opulus at Skive (20-4-59, 4-5-59, 16-5-59). The species migrates from Viburnum to monocotyledoneous plants (Eriophorum, Carex, and others). In the spring the leaves of Viburnum are strongly curled and sticky of honey-dew.

Genus **ACAUDINUM** Börner, 1930.

139. *Acaudinum scabiosae* Hille Ris Lambers, 1959.
Acaudinum centaureae (Koch) Börner, 1952, p. 95, no. 333.

Distribution: Europe. It is known from Sweden.

Occurrence in Denmark: Collected on Centaurea scabiosa on Avernakø south of Funen (11-7-57).

Genus **CRYPTOSIPHUM** Buckton, 1879.

140. *Cryptosiphum artemisiae* Buckton, 1879.
Cryptosiphum artemisiae Börner, 1952, p. 95, no. 331.

Distribution: Europe. It is known from Sweden.

Occurrence in Denmark: Rather common on Artemisia vulgaris, on the leaves of which it causes reddish galls. On Funen collected at Svanninge Bakker (12-7-57). In Jutland collected at Sundsøre (12-8-57), Skive (9-5-60), Dommerby near Skive (4-9-57), and Femmøller, Mols (3-8-59). Rostrup (1897) tells that the species (syn. *Aphis gallarum* Kalt.) is rather common on Artemisia vulgaris in Denmark. Henriksen (1944) gives records from several localities on Bornholm, Sealand, and Lolland.

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(continued from Entom. Medd. 32, 1964, p. 357)

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ANMELDELSE

Victor Hansen: Biller XXII, træbukke. Larverne ved Sv. G. Larsson. — Danmarks Fauna, bd. 73. 228 sider. 47,50 kr.

Jensen-Haarups og K. Henriksens bog om de danske træbukke og deres larver, der udkom i 1914, har længe været udsolgt fra forlaget og har endnu længere trængt til en afløser. Denne er nu kommet.

Siden 1914 er vor viden om de her omhandlede biller øget ganske betydeligt — ikke mindst takket være mænd som Carl von Demelt, E. A. J. Duffy, N. A. Kemner og Thure Palm, og denne viden er i høj grad kommet bogen til gode, således at dens sidetal, 228, er mere end det dobbelte af 1914-bogens, og selv om den er en fornyelse af denne, fremtræder den dog fuldstændigt som en helt ny bog om Danmarks træbukke.

Begge bogens afsnit rummer en række særdeles anvendelige bestemmelsesnøgler og mange gode tegninger, og her må Victor Hansens gengivelser af de fuldt udviklede træbukke fremhæves som noget ganske enestående.

For den, der ønsker yderligere oplysninger om dyrene, har Victor Hansen efter beskrivelsen af de enkelte arter anført fyldige litteraturhenvisninger.

Bogen vil hævde sig smukt i den lange række bind om Danmarks biller, som Victor Hansen — endnu en gang fortrinligt suppleret af Sv. G. Larsson — har beriget os med.

H. Friis-Jensen.

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(Noona Dan Papers No. 44.)

Some Sarcophagidae (Diptera) from the Bismarck Islands and the Philippines.

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The Sarcophagidae studied in the present paper were collected during the Noona Dan Expedition in the years of 1961—1962 (see Petersen, 1966). The material is a significant representation of the fauna of the Bismarck Islands which were hitherto poorly known.

The most important fact observed is the different degree of variability in the various species inhabiting the Islands. *Parasarcophaga (Pandelleisca) insularis* n. sp. from Lavongai presented a few differences in the structure of the penis when it was compared with another specimen from Dyaul, and a very near species (*lorengauensis* sp. n.) is found in the Island of Manus. On the other hand, the subgenus *Liosarcophaga,* a subgenus near *Pandelleisca,* is represented by the very widespread *P.* (*L.*) *misera* Walker and by *P.* (*L.*) *rohdendorfi* (Baranov) which demonstrate a low degree of variation in the genitalic characters. *P.* (*L.*) *aurifrons* (Macquart) when compared with Australian specimens, shows some differences (fig. 61). There are two additional new species of this subgenus restricted to the Philippines and New Ireland.

The most characteristic genus of the region is *Bezziola* with five species, four of which are new to science. The species of this genus are very similar and characterized especially by the male genitalia, some of them are living together.

Another curious fact is the presence of the big and golden species of *Tricholioproctia,* found only in the Solomon and Bismarck Islands.

The holotypes and allotypes were returned to the Zoological Museum, Copenhagen; some paratypes were incorporated in the collection of the Instituto Oswaldo Cruz.

Blaesoxipha pachytyli (Skuse, 1891). (Figs. 1 and 2).

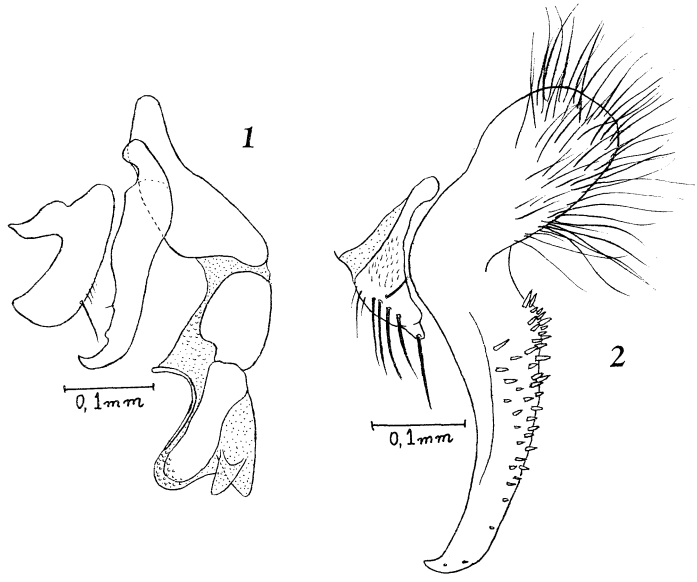
Masicera pachytyli Skuse, 1891: 251.

Blaesoxipha pachytyli: Lopes, 1955: 315, figs. 1—6.

This species was described from Australia, being the most common Sarcophagid fly parasite on locusts in that country. The specimens from the Philippines and the Bismarck Archipelago are very similar to specimens from Australia. The slight differences are as follows: the spines of the forcipes superiores are more numerous, the ventralia is a little less chitinized and the lobes of the apical plate of the paraphallus are a little less elongated. It is very interesting that so widespread a species shows so little differences in the male genital characters. The figures published in the present paper are based on a Philippine specimen.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♀, 25 August 1961. — TAWI TAWI: Tarawakan, 4 ♂, 1 ♀, 12—14 Nov. 1961.

Bismarck Islands. — NEW IRELAND: Lemkamin, 900 m, 1 ♀, 16 April 1962. — LAVONGAI: Banatam, 2 ♀, 18 and 25 March 1962. — MUSSAU: Boliu, 1 ♂, 3 June 1962. — MANUS: Lombrum, 1 ♀, 29 June 1962.



Blaesoxipha pachytyli (Skuse).

Fig. 1: penis and internal forcipes; fig. 2: external forcipes.

Phytosarcophaga australis (Johnston & Tiegs, 1921).

Helicobia australis Johnston & Tiegs, 1921: 50, fig. 24 (Australia).
Heteronychia australis: Lopes, 1959: 42.

In a previous paper (Lopes, 1959) I considered this species as belonging to the genus *Heteronychia* Brauer & Bergenstamm, but now I think it is better to include it in *Phytosarcophaga* Rohdendorf, 1937, in spite of some differences in the male genitalia. However, the apical plate of the paraphallus is also long and slender, the styli are very elongate, the ventralia is lacking. The external characters agree also; the R_1 with bristles, the three presutural dorsocentral bristles and the propleura scarcely pilose anteriorly demonstrate great affinity between *australis* (J. & T.) and *destructor* Malloch, the type-species of *Phytosarcophaga.*

Bismarck Islands. — NEW BRITAIN: Valoka, 1 ♀, 7 July 1962. — NEW IRELAND: Danu, Kalili Bay, 1 ♂, 1 ♀, 29 April 1962. — DYAUL: Sumuna, 2 ♀, 9 March 1962. — LAVONGAI: Banatam, 3 ♂, 1 ♀, 18—26 March 1962. — MUSSAU: Talumalaus, 1 ♀, 1 Febr. 1962. — MANUS: Lorengau, 2 ♂, 1♀, 23—24 June 1962.

Phytosarcophaga gressitti (Hall & Bohart, 1948).

Sarcophaga gressitti Hall & Bohart, 1948: 50 (5): 131, pl. 13.
Phytosarcophaga gressitti: Lopes, 1958: 21, fig. 3.

Provisionally I maintain this species in the genus *Phytosarcophaga.* However, the presence of more than three postsutural dorsocentral bristles; the penis showing short styli and less elongated apical plate in addition to the constitution of the sternites and a pigmented membrane between the tergites in the female genitalia suggest a new genus related to *Phytosarcophaga.*

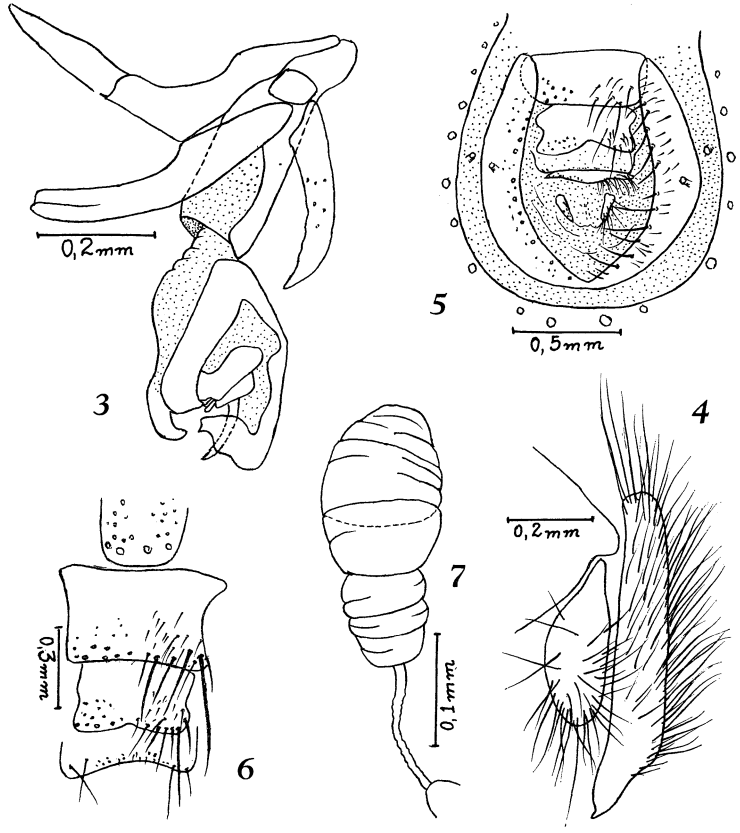
Philippines. — PALAWAN: Brooke's Point, Uring Uring, 2 ♂, 3 ♀, 22 Aug. to 11 Sept. 1961. — BALABAC: Dalawan Bay, 1 ♂, 1 ♀, 8 and 11 Oct. 1961.

Bismarck Islands. — MANUS: Lorengau, 1 ♀, 25 June 1962. — LAVONGAI: Banatam, 1 ♂, 18 March 1962.

Heteronychia (Pandeleola) simplex sp. n. (Figs. 3 to 7).

M a l e : length 6 to 8 mm. Front 0,28 of head width. Head gray, ocellar bristles strong; some small bristles below, in the series of parafacialia; one or two frontal bristles below base of antennae, the latter reaching 0,8 of the distance to vibrissae.

Presutural dorsocentral and acrostichal bristles well developed.



Heteronychia (P.) simplex sp. n.

Fig. 3: penis and internal forcipes; fig. 4: external forcipes; fig. 5: female genitalia; fig 6: female genital sternites; fig. 7: spermatheca.

always 3 dorsocentral postsutural spaced for three. Middle tibia with one, hind tibia with two ventral bristles; R_1 bare, R_{4+5} with hairs almost to the transverse vein.

Abdomen with a pair of strong median marginal bristles on third segment; sternites II to IV with strong hairs disposed apically. Genital segments black; the first with gray pollen and scarce hairs; the second with dense hairs. Forcipes superiores straight, the apex curved forward; forcipes interiores curved, palpi genitalium long, both without hairs; paraphallus strongly pigmented, apical plate short, incorporated to paraphallus, lateral plate vestigial; ventralia represented by a small chitinized rounded lobe; styli of glans surpassing a little the apical plate.

F e m a l e : front about 0,32 of head width. Median marginal bristles of the third abdominal segment small or not differentiated, tergites VI plus VII entire in spite of being narrowed dorsally; the following tergites not represented; sternites VI plus VII with hairs and bristles laterally on hind margin; sternite VIII with hairs and bristly hairs on hind region; sternite IX membranous with small hairs on the posterior margin and two long slender hairs on each side. Spermatheca elongated, well divided in two portions, the proximal one more distinctly striated transversally.

Distinct from any other species included in the subgenus by the form of the male genitalia.

Bismarck Islands. — NEW BRITAIN: Valoka, allotype 1 ♀, 10 July 1962, paratypes 1 ♂, 1 ♀, 7—10 July 1962. — NEW IRELAND: Danu, Kalili Bay, holotype ♂, paratypes 1 ♂, 1 ♀, 3 April 1962. — MUSSAU: Malakata, paratypes 1 ♂, 2 ♀, 9 June 1962.

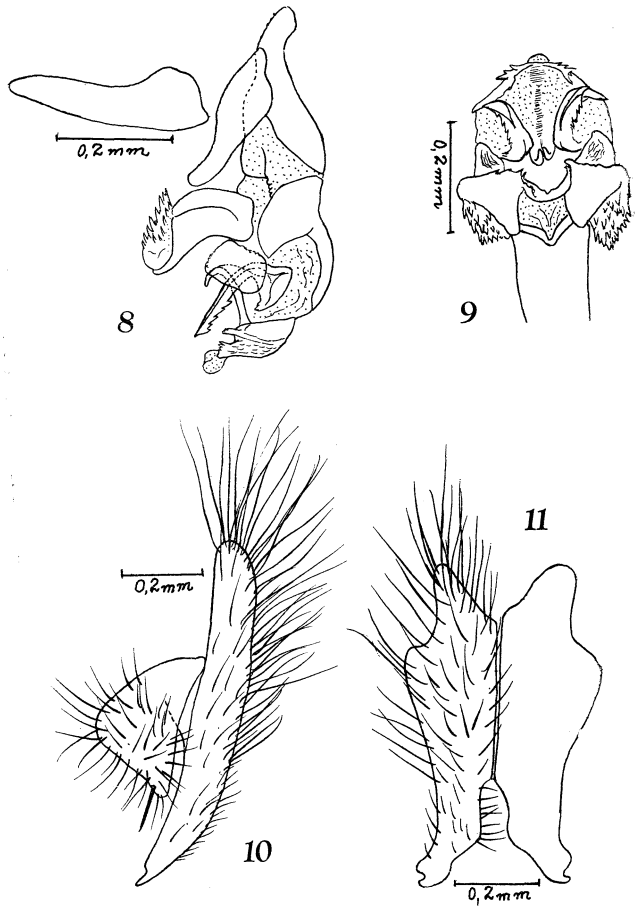
Johnstonimyia fatua sp. n. (Figs. 8 to 11).

M a l e : length 8 mm. Head slightly yellowish. Ocellar bristles as developed as the smaller frontal bristles. Hairs of parafacialia long and slender. Gena with black hairs.

Presutural acrostichal bristles well developed; a pair of strong apical scutellar bristles. Middle tibia with a small, and hind tibia with a strong ventral bristle. R_1 bare, R_{4+5} with hairs on basal half of the distance to cross-vein.

Third abdominal tergite without median marginal bristle. Sternites II to IV with small scarce hairs on the disc buth with long hairs on lateral and posterior margins, second sternite with four bristles on the disc. Forcipes superiores curved and pointed at the apex; when seen from behind, the extremities are strongly divergent; forcipes inferiores almost triangular; internal forcipes without bristles; paraphallus strongly chitinized, apical plate with lateral spinous arms, a membranous rounded apical lobe and a pair of long curved ventral apophyses disposed internally; lateral plates rounded, styli of glans curved dorsally, somewhat slender; ventralia strongly chitinized with spinous apical lobe.

Provisionally, I enclose this species in *Johnstonimyia* on account of the presence of presutural acrostichal bristles and the complex apical plate of paraphallus. However, the styli of glans are more slender than in any other species hitherto considered as belonging to this genus.



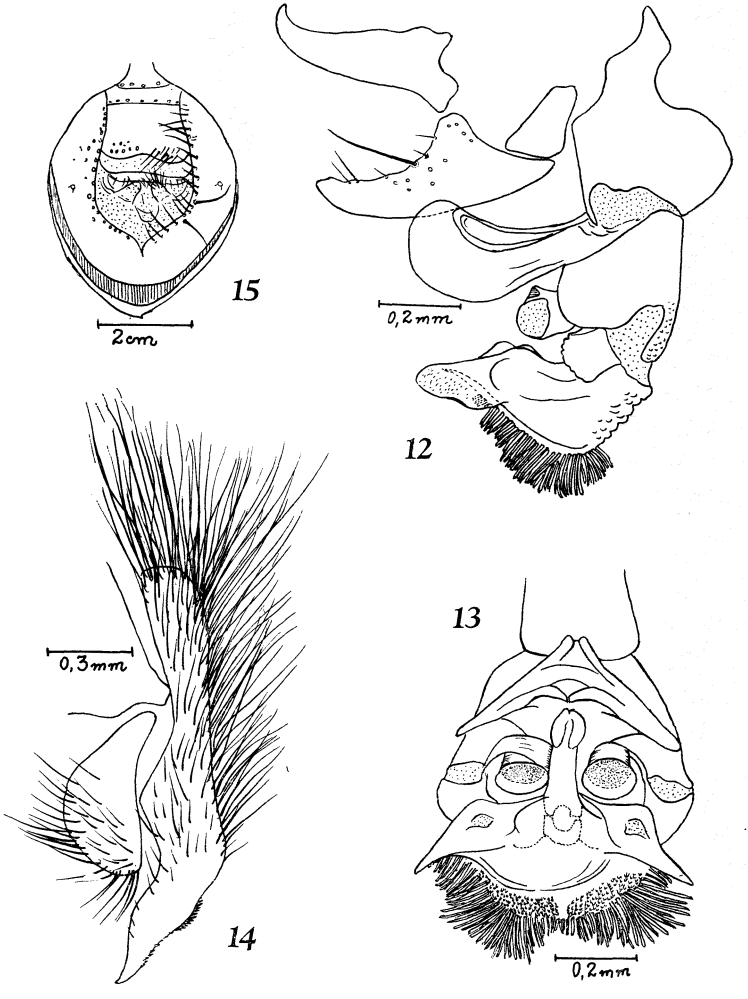
Johnstonimyia fatua sp. n.

Fig. 8: penis and internal forcipes; fig. 9: penis, ventral view; fig. 10: external forcipes; fig. 11: forcipes superiores.

Bismarck Islands. — MANUS: Lorengau, holotype ♂, 18 June 1962.

Johnstonimyia aurescens sp. n. (Figs. 12 to 15).

M a l e : length 14 mm. Head golden, ocellar bristles small; front about 0,2 of head width; antenna reaching 0,9 of the distance to vibrissae; third joint gray, second shining black; four to five frontal bristles below the base of antennae; long sparse slender hairs on parafacialia; genae with long black hairs.



Johnstonimyia aurescens sp. n.

Fig. 12: penis and internal forcipes; fig. 13: penis, ventral view; fig. 14: external forcipes; fig. 15: female genitalia.

Thorax yellow; presutural acrostichal bristles differentiated from sorrounding hairs, last pair stronger; presutural dorsocentral bristles strong; four strong postsutural dorsocentral bristles, the two posterior bristles much longer than the anterior pair; prescutellar acrostichals well differentiated; middle tibia with long villous hairs and a strong ventral bristle; R_{4+5} with hairs a little beyond the middle of the distance to cross-vein.

Abdomen golden, second tergite with a broad black vitta; third and fourth with slender median vittae; third tergite without median marginal bristles; sternites I and II with long dense pile; sternites III and IV with short hairs; seventh tergite represented by a series of long bristles near the stigma, eighth tergite elongated, ninth of normal size; forcipes superiores bent forward with small spines near the pointed apex, and covered, especially on basal half, with very long dense hairs; internal forcipes robust, forcipes interiores with a long bristle and some hairs on the anterior face; theca very stout with sinuous posterior margin; paraphallus short, very much chitinous; apical plate very much developed with anterior apophyses and two groups of densely disposed blunt spines; lateral plate short and somewhat membranous; a small chitinous plate between apical and lateral plates; ventralia very much developed, chitinous, showing a pair of acute lateral apophyses; glans elongated, styli very broad and short, united to the lateral plates.

F e m a l e : length 11 mm. Front 0,27 of head width; ocellar bristles well developed; scutellum without apical bristle; middle tibia with long bristle; tergite VI+VII yellow; sternite VI+VII with marginal bristles, sternite VIII concave posteriorly with two groups of bristles near the hind margin, sternite IX membranous (fig. 15).

The structure of the penis will separate this species from all species included in the genus.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, holotype ♂, 22 May 1962; Komgi, 1000 m, paratype ♀, 14 May 1962.

Genus **Bezziola** Lopes, 1958.

There are, among the material examined, five species of this genus, including *B. crinita* (Parker, 1917), probably belonging to an allied new genus. All species have well developed anterior acrostichal bristles and *B. setifacies* sp. n. shows a bristled R_1.

I considered (1958) as *Bezziola sticklandi* (Hall & Bohart) some specimens from Agriham (N. Mariana Is.), which have bristles on R_1 and show some small differences in the genitalia. Now I understand that there are a lot of species in the genus *Bezziola* showing small differences in the male genitalia and the referred specimens from Agriham should be considered as a new species.

Sarcosolomonia tulagiensis Baranov, 1938 was described and

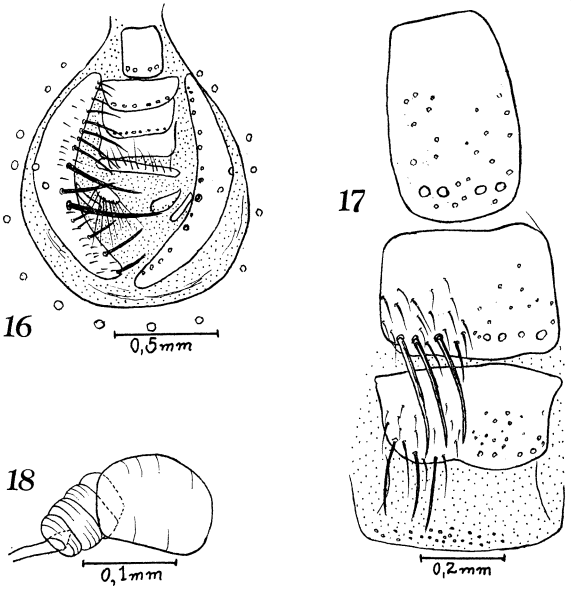
figured as having the penis and palpi genitalium with some features very alike the species included in *Bezziola.* However, the figure of the penis shows a short and stout piece bearing small bristles which I cannot interpret. If *tulagiensis* Bar. proves to be congeneric with the species I include in *Bezziola,* the name *Sarcosolomonia* Baranov, 1938 must substitute *Bezziola* Lopes, 1958.

Bezziola crinita (Parker, 1917). (Figs. 16 to 18).

Sarcophaga crinita Parker, 1917: 92, fig. 2 (Philippine Is.)
Sarcophaga kankauensis Baranov, 1931, fig. 4 (Formosa). S y n. n o v.
Bezziola kankauensis: Lopes, 1959: 44, figs. 2—4 (New Britain).

I examined a male specimen collected by the late S. Kiener on August 8, 1958, in Luan Pi, Formosa and I have no doubt that *kankauensis* is a synonym of *crinita.*

I have also two male specimens from Australia (Cairns, N. Queensland, J. F. Illingworth and A. P. Dodd), both with distended genitalia, but lacking the penis. The remaining pieces of the organ agree entirely with the specimens of *crinita* Parker from the



Bezziola crinita (Parker).

Fig. 16: female genitalia; fig. 17: female genital sternites; fig. 18: spermatheca.

Philippines and I think it is possible that *Bezziola synia* (Johnston & Hardy, 1923) is merely a synonym of *crinita*.

The male of this species was described in my paper on Australian species (1959) under the name of *kankauensis*.

Female: front about 0,29 of the head width. Genital segments black, tergites VI plus VII composed of two plates; tergite VIII represented by two small plates without bristles (fig. 16). Sternites VI plus VII wider than high, with well developed marginal bristles; sternite VIII somewhat concave on hind margin, with only well differentiated small bristles on the margin; sternite IX entirely membranous with small hairs on the middle of the hind margin (fig. 17). Spermathecae with two well distinct sections, the proximal one transversely striated (fig. 18).

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 2 ♂, 3 ♀, 19 Aug.—20. Sept. 1961. — BALABAC: Dalawan Bay, 3 ♂, 11—12 Oct. 1961.

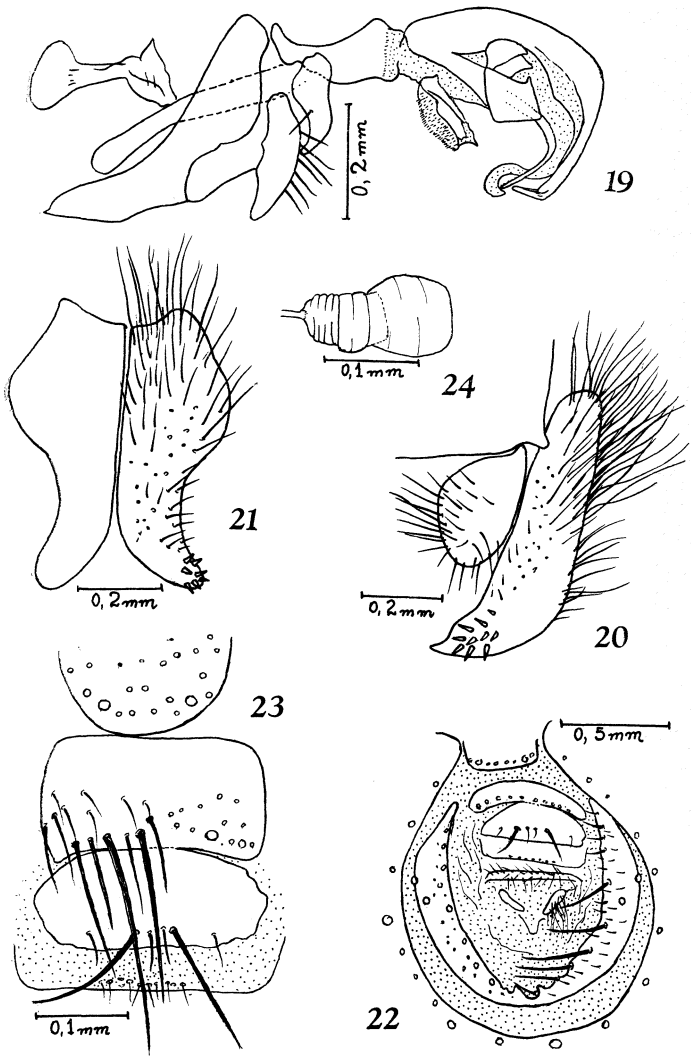
Bismarck Islands. — NEW BRITAIN: Rabaul, 1 ♂, 25 July 1962. — MUSSAU: Talumalaus, 1 ♀, 1 Febr. 1962; Malakata, 1 ♀, 10 June 1962. — MANUS: Lorengau, 1 ♂, 1 ♀, 17—18 June 1962.

Bezziola setifacies sp. n. (Figs. 19 and 20).

Male: length 6 to 9 mm. Head silvery, slightly yellowish, front about 0,25 of head width. Ocellar bristles developed, outer vertical bristle differentiated from ocular ciliae; parafacialia with a series of bristles, the lower ones very strongly developed. Three frontal bristles below the antennae which reach 0,9 of the distance to vibrissae. Genae with black, long sparse hairs.

Presutural acrostichal and dorsocentral bristles well developed. Middle tibiae with one strong ventral bristle; hind tibia with two ventral bristles and two bristles on anterior face, the lowest one very strongly developed. R_1 bristled on the middle. R_{4+5} hairy almost to the transverse vein.

Abdomen with a pair of median marginal bristles on third segment which are sometimes very small; sternites II to IV with strong marginal bristles. Genital segments black, with long hairs. Forcipes superiores curved forward, with a lot of spines near the apex (fig. 20); forcipes inferiores rounded; forcipes interiores elongated with a long bristle near the middle; palpi genitalium bearing a series of about six bristles; apical plate of paraphallus



Bezziola setifacies sp. n.

Fig. 19: penis and internal forcipes; fig. 20: external forcipes; fig. 21: forcipes superiores, dorsal view; fig. 22: female genitalia; fig. 23: female genital sternites; fig. 24: spermatheca.

united to paraphallus, elongated, bent at the apex; ventralia very small, membranous; styli of glans very elongated. There is a membranous process placed near the apical plate (fig. 19).

F e m a l e : front about 0,3 of head width, hairs of the para-

facialia very strong. The preapical bristles of the scutellum and median marginal bristles of third abdominal segment are absent. Tergite VI plus VII entire; no plates representing the tergite VIII. Sternites VI plus VII with long bristles on hind margin; sternite VIII with two long and two small bristles on the center of posterior margin besides a pair of small bristles on the sides; sternite IX membranous, bearing small hairs with large insertion on the hind margin (fig. 22). Spermathecae with the proximal part strongly striated transversally (fig. 24).

This species shows very characteristic small ventralia, not found in any other species of the genus.

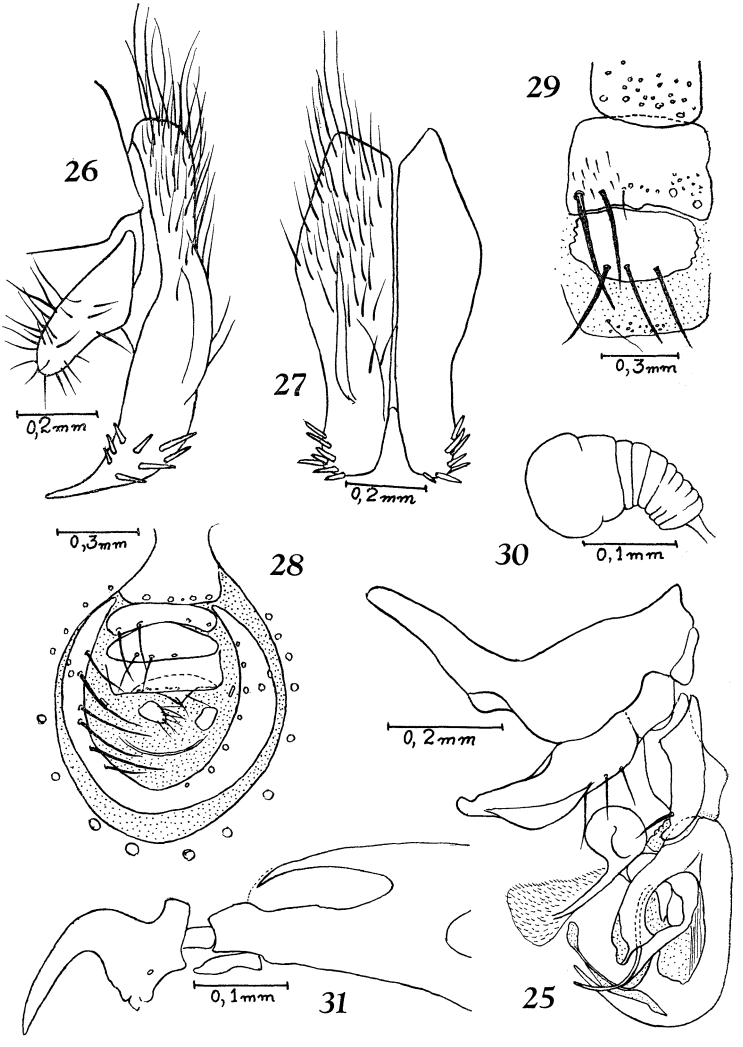
Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, allotype ♀, 17 May 1962. — NEW IRELAND: Lemkamin, 900 m, holotype ♂, 20 April 1962, paratypes 2 ♂, 11 and 20 April 1962; Danu, Kalili Bay, paratype ♀, 30 April 1962. — LAVONGAI: Banatam, paratype ♀, 24 March 1962.

Bezziola baranovi sp. n. (Figs. 25 to 31).

M a l e : length 6,5 to 8 mm. Head silvery to slightly yellowish; front about 0,25 of head width. Antennae reaching 0,9 of the distance to vibrissae. Ocellar bristles moderately developed; a series of bristly hairs on the parafacialia; genae with a few long black hairs.

Presutural acrostichal bristles well differentiated from surrounding hairs, the pair immediately before the suture being especially long; preapical scutellar bristle absent. All tibiae with ventral bristles; middle tibiae with two long anterior bristles, the lower one very much developed. R_1 bare, R_{4+5} with hairs on basal half to basal two-thirds of the distance to cross-vein.

Third abdominal tergite always with a pair of long median marginal bristles, abdominal sternites II to IV with long dense hairs but without differentiated bristles. Genital segments black, the first with grayish black pollen, the second shining. Forcipes superiores pointed and bent at the apex, with long spines; forcipes inferiores somewhat elongated (figs. 26 and 27); forcipes interiores with a bristle near the apex; palpi genitalium with a longitudinal flap and three bristles on basal half; apical plate of paraphallus united to paraphallus, having a membranous elongated lobe near the apical plate which should be considered the lateral plate;



Bezziola baranovi sp. n.

Fig. 25: penis and internal forcipes; fig. 26: external forcipes; fig. 27: forcipes superiores, dorsal view; fig. 28: female genitalia; fig. 29: female genital sternites; fig. 30: spermatheca; fig. 31: first stage larva.

ventralia with a chitinous supporter and a long membranous lobe; styli of glans very elongated (fig. 25).

F e m a l e : tergites VI plus VII entire, VIII represented by two very small plates (fig. 28); sternites VI plus VII with four long

marginal bristles; sternite VIII very characteristic, entirely bare and flat, except for four median bristles on hind margin (two specimens examined show only three bristles instead of four) (fig. 29). Spermatheca curved, proximal section much wrinkled.

L a r v a e I. Five specimens of first stage larvae were found in a dissected female. The spines in the center of the ventral margin of first thoracic segment are very condensed; the dentate sclerite is incorporated to the mouth kooks, the infrahypostomal sclerite is well differentiated from the hypostomal. However, the most characteristic feature of the larvae is the great development of the posterior arms of the labrum.

Bismarck Islands. — NEW BRITAIN: Valoka, paratype ♂, 5 July 1962. — DYAUL: Sumuna, paratypes 3 ♂, 2 ♀, 6—7 March 1962. — LAVONGAI: Banatam, holotype ♂, 21 March 1962, allotype ♀, 24 March 1962, paratypes 10 ♀, 19—25 March 1962.

This species is very much similar to *Lioproctia paneiana* Baranov described from Guadalcanal, differing mainly by the apical spines of the forcipes superiores and by the shape of the ventralia.

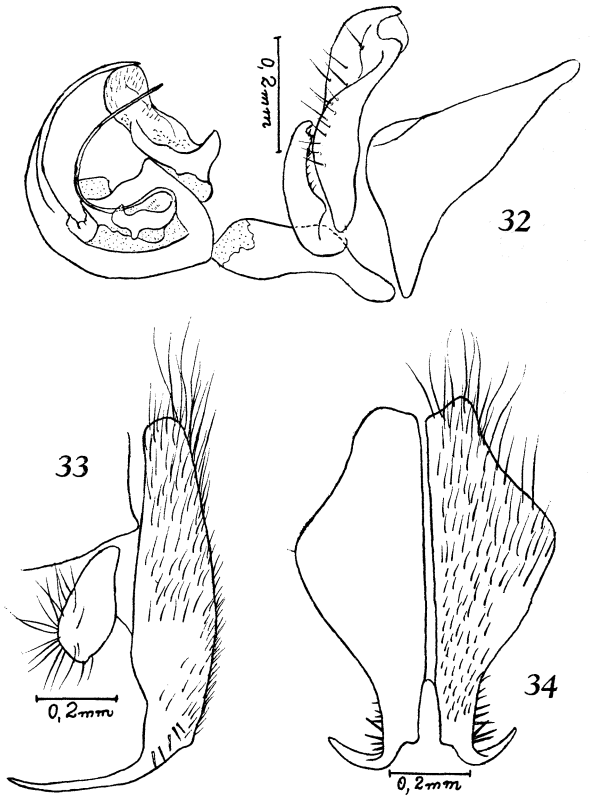
Bezziola sumunensis sp. n. (Figs. 32 to 34).

M a l e : length 6 to 7 mm. Head slightly yellowish. Front about 0,22 of the head width, hairs of parafacialia well developed; ocellar bristles long; genae with black hairs only on the anterior half; antennae about 0,88 of the distance to vibrissae.

Presutural acrostichal bristles long; scutellum without preapical bristle; anterior and middle tibiae with ventral bristles but hind tibiae without ventral bristles. Wings hyaline, R_1 bare, R_{4+5} with hairs almost to cross-vein.

A pair of long median marginal bristles on third segment of abdomen. Sternites II to IV with hairs which are longer on hind margins, but without differentiated bristles. Genital segments black. Forcipes superiores bent at the apex, bearing long apical apophyses and a few small long spines; forcipes inferiores elongated; forcipes interiores with some small hairs; palpi genitalium with a large external flap and numerous long hairs; apical plate of paraphallus very long and slender; ventralia almost entirely membranous; styli of glans very long and slender.

Somewhat similar to *B. baranovi* sp. n. but with the apical apophyses of the forcipes superiores very much elongated. The



Bezziola sumunensis sp. n.

Fig. 32: penis and internal forcipes; fig. 33: external forcipes; fig. 34: forcipes superiores, dorsal view.

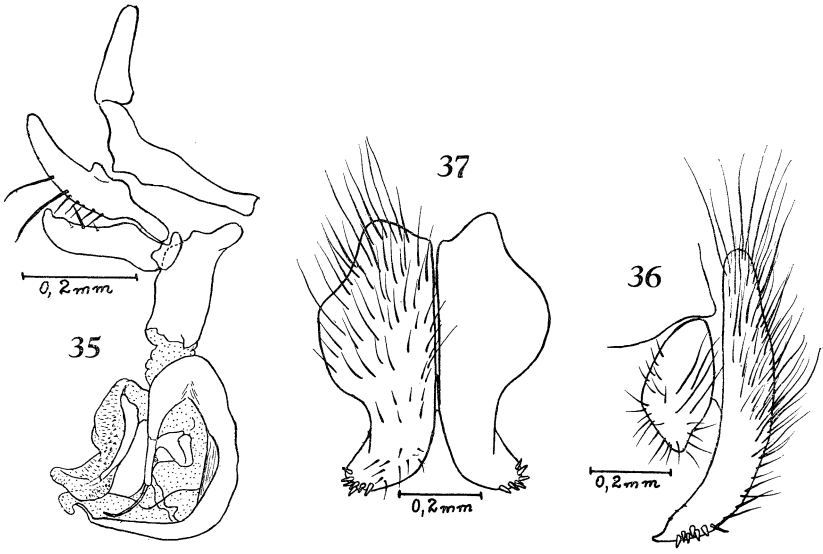
apical plate and styli are also elongated and the penis is very characteristic.

Bismarck Islands. — DYAUL: Sumuna, holotype ♂, 7 March 1962, paratype ♂, 13 March 1962.

Bezziola confusa sp. n. (Figs. 35 to 37).

M a l e : length 7,5 mm. Head silvery, a little yellowish. Front about 0,26 of head width; ocellar bristles moderately long; a series of about seven parafacial bristles which are not very stout. Antennae reaching 0,9 of the distance to vibrissae. Genae with long black sparse hairs.

Presutural acrostichal bristles only differentiated from sur-



Bezziola confusa sp. n.

Fig. 35: penis and internal forcipes; fig. 36: external forcipes; fig. 37: forcipes superiores, dorsal view.

rounding hairs. Preapical scutellar bristles present. Only the middle tibia bearing ventral bristles; lowest anterior bristle of the middle tibia exceeding the apex of the tibia. R_1 bare, R_{4+5} with hairs on the basal three fourth of the distance to transverse vein.

A pair of median marginal bristles on the third abdominal tergite. Sternites II to IV bearing a few marginal bristles. Forcipes superiores with curved dorsal surface, bearing small spines near the apex, which is pointed (fig. 37); forcipes interiores with a robust hair and two more small hairs near the middle; palpi genitalium bearing a series of bristles, the two distal ones more developed; apical plate of paraphallus united to paraphallus, having interiorly a large membranous lobe; ventralia large, entirely membranous, elongated; styli of glans not much elongated.

This species is similar, in the genitalic characters, to *B. carolinensis* Lopes, 1958, differing by the shape of forcipes superiores and by the form of the penis.

Bismarck Islands. — LAVONGAI: Banatam, holotype ♂, 21 March 1962.

Genus **Tricholioproctia** Baranov, 1938.

Among the specimens studied I found five species from the Bismarck Islands. One of them is the type-species *T. antilope* (Boettcher), a very widespread one in the Oriental region, and which has the common "habitus" of *Tricholioproctia:* medium size, and tesselated abdomen. The other four, considered as new species, present the aspect of the species found only in the Islands of Bismarck and Solomon groups; they are of big size, with intense golden pollinosity, the abdomen does not show tesselated markings. One of them (*T. nigriventris* sp. n.) has a shining black abdomen, like *T. magnifica* Baranov. However, these two species are not related on account of the male genitalia. The other three species are entirely golden, like *T. imitatrix* Baranov, but without the black border of the abdominal tergites. The differences in external characters are the presence or absence of parafacial hairs, the colour of genal hairs and the distribution of hairs on the facialia. The fourth abdominal tergite of each species is characteristic, considering the apical brushes of hairs (figs. 40, 43 and 46). All these three species are not closely related, especially *T. longestylata* sp. n. is deviating much from the other species by its very different ventralia, remembering *T. alpha* (Johns. & Tiegs). *T. aureifacies* sp. n. and *T. separata* sp. n. show the ventralia similar to those of *imitatrix* Baranov. It is very curious that the general similarity of the flies does not necessarily imply natural relationship of the species.

Tricholioproctia antilope (Boettcher, 1913).

Sarcophaga antilope Boettcher, 1913: 380, fig. 3.
Tricholioproctia antilope: Lopes, 1954: 237 figs. 1 to 8.

All specimens from Bismarck are intensely yellowish gray pollinose, the males measuring 15 mm of length. The male from the Philippines is grayish pollinose and is only 8 mm in length.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♂, 21 Aug. 1961.

Bismarck Islands. — NEW BRITAIN: Rabaul, 1 ♀, 25 July 1962; Bita Paka, SE of Kokopo, 1 ♂, 10 July 1962. — DUKE OF YORK: Manuan, 1 ♂, 20 July 1962. — NEW IRELAND: Lemkamin, 900 m, 2 ♀, 9 and 12 April 1962. — DYAUL: Sumuna, 2 ♂, 7—8 March 1962. — LAVONGAI: Banatam, 1 ♂, 21 March 1962. — MUSSAU: Talumalaus, 2 ♀, 19 Jan. and 13 Febr. 1962.

Tricholioproctia longestylata sp. n. (Figs. 38 to 40).

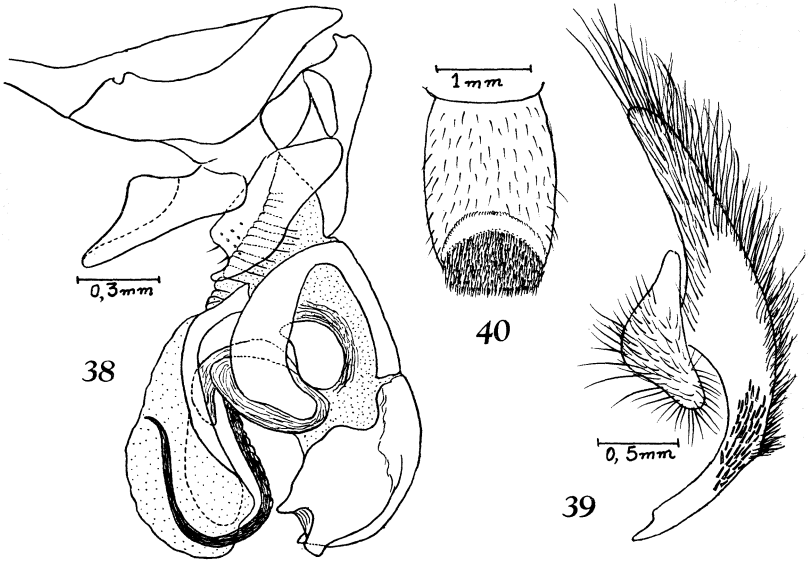
Male: length 17 to 21 mm. Head intensely golden pollinose, front about 0,21 of head width; ocellar bristles long and slender; three to four frontal bristles below base of antennae; antennae reaching 0,88 of the distance to vibrissae; erect black hairs on lower two-thirds of facialia; parafacialia with a series of black hairs near eye, the lower ones long; back of head with some black hairs above besides the postocular cilia; genae with black hairs, sometimes limited to the region near the eyes; the remainder hairs are golden; third antennal joint gray, a little reddish; palpi black.

Mesonotum and upper part of pleura intensely golden, the vittae black; presutural acrostichal bristles only differentiated from surrounding hairs, the pair immediately before suture more elongated; presutural dorsocentral bristles well differentiated; legs black, femora and tibiae long villous.

Abdomen intensely golden, under side gray; base and a median broad vitta on second tergite, a broad median vitta on third, a small narrow median vitta on fourth and a very narrow median vitta on fifth tergite intensely black; a pair of median marginal bristles on third tergite; abdominal sternites first to third with long, dense hairs, fourth sternite with short hairs and a brush of dense black hairs occupying an elevated area on entire hind margin of the sternite (fig. 40). Genital segments black, the first with yellow pollinosity, the second shining. Forcipes superiores strongly curved forward, with small spines near the apex; internal forcipes robust, palpi genitalium with an external flap; apical plate of paraphallus rounded at the apex; ventralia very large, not much chitinized, styli of glans long and curved.

Female: length 12 to 18 mm. Front about 0,26 of head width; ocellar bristles well developed; middle tibiae with strong preapical ventral bristle; abdominal sternites V and VI plus VII with two series of strong marginal bristles; sternite VIII depressed on middle with lateral groups of strong hairs; tergite VI plus VII entire, well chitinized on middle, with strong and numerous marginal bristles.

By the structure of the ventralia the most related known species is *T. alpha* (J. & T.), from which the present species differs mainly by the form of the apical plate and the structure of the forcipes superiores. Specimens from New Britain are somewhat less intensely golden than the flies from New Ireland.



Tricholioproctia longistylata sp. n.

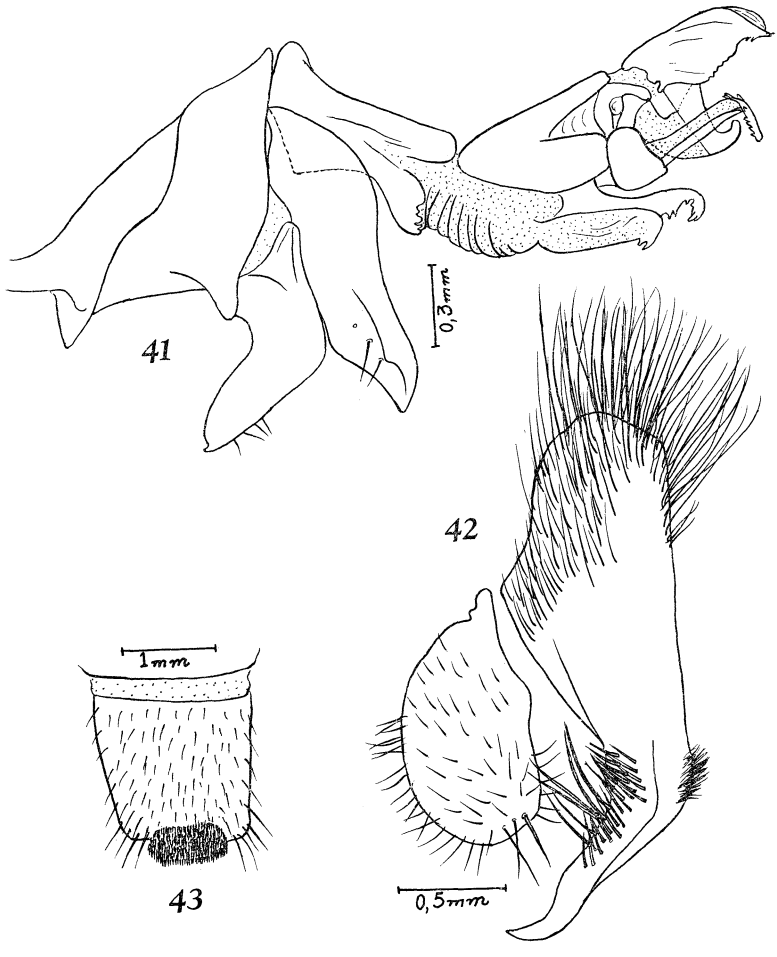
Fig. 38: penis and internal forcipes; fig. 39: external forcipes; fig. 40: fourth abdominal sternite.

Bismarck Islands. — NEW IRELAND: Lemkamin, 900 m, holotype ♂, 17 April 1962, allotype ♀, 21 April 1962, paratypes 3 ♂, 3 ♀, 9—21 April 1962. — NEW BRITAIN: Yalom, 1000 m, paratypes 1 ♂, 2 ♀, 14—22 May 1962.

Tricholioproctia aureifacies sp. n. (Figs. 41 to 43).

M a l e : length 18 to 21 mm. Differs from *longestylata* sp. n. as follows: front about 0,24 of head width; antennae reaching 0,85 of distance to vibrissae, third article reddish with gray pollen; palpi red; facialia with hairs only on the lower half; parafacialia without hairs; genae with yellow pile, having sometimes a few black hairs.

Third abdominal tergite with weak marginal bristles. Abdominal sternites I and II with long dense hairs, III and IV with short hairs, the latter with a brush of dense hairs limited to the middle of the hind margin. Forcipes superiores strongly bent forward, with apically curved and long strong bristles near the apex; internal forcipes both with hairs near apex; apical plate of paraphallus narrow; ventralia very much chitinized with two spined points;



Tricholioproctia aureifacies sp. n.

Fig. 41: penis and internal forcipes; fig. 42: external forcipes; fig. 43: fourth abdominal sternite.

styli of glans strong, easily visible because of the weak development of the plates of paraphallus.

Female: length: 20 mm, front about 0,25 of head width. Third abdominal tergite without median marginal bristles.

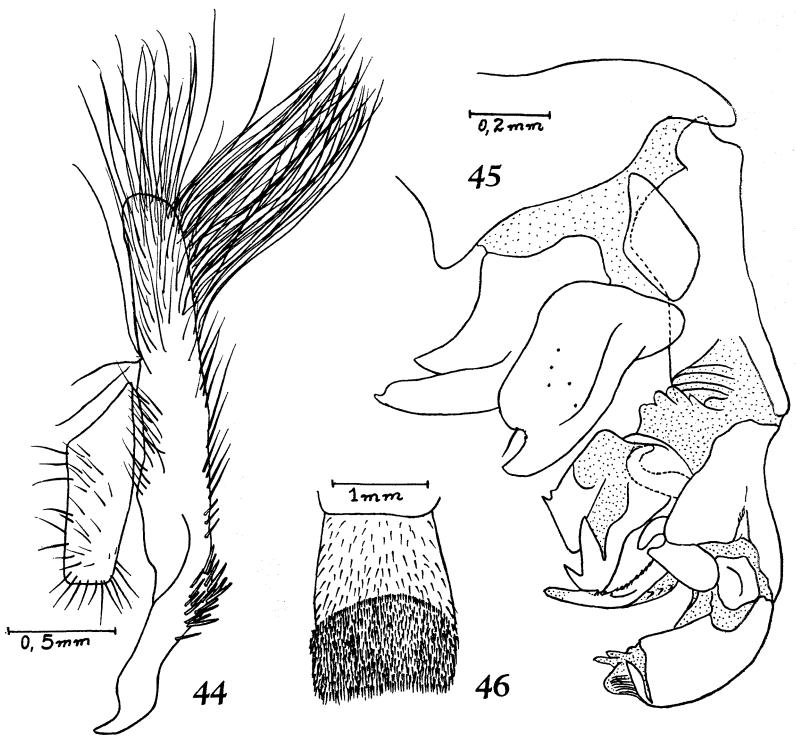
This species is similar, by the male genitalia, to *T. impatiens* (Walker), but differs mainly by the aspect of the forcipes superiores and structure of the ventralia.

Bismarck Islands. — NEW IRELAND: Lemkamin, holotype ♂,

17 April 1962, allotype ♀, 20 April 1962, paratypes 2 ♂, 17—20 April 1962.

Tricholioproctia separata sp. n. (Figs. 44 to 46).

M a l e : length 18 mm. Differs from *T. longestylata* sp. n. as follows: body less golden pollinose; front about 0,21 of head width, ocellar bristles small; genae almost entirely covered with black hairs; an almost complete row of black hairs on occiput, besides the postocular cilia; lower hairs of parafacialia well developed; presutural acrostichal and dorsocentral bristles well developed. Median marginal bristles of third abdominal tergite weak; fourth sternite with a large brush of hairs occupying almost the apical half of the sclerite. Forcipes superiores little curved forward, the apex with a curved point, numerous spines before the



Tricholioproctia separata sp. n.

Fig. 44: penis and internal forcipes; fig. 45: external forcipes; fig. 46: fourth abdominal sternite.

extremity; forcipes inferiores almost quadrangular, elongated, palpi genitalium with two points; apical plate of paraphallus with membranous apex; ventralia large, with chitinouos recurved apophyses; styli short and stout.

This species is near *aureifacies* sp. n., differing mainly by the characters of male genitalia.

Bismarck Islands. — NEW IRELAND: Lemkamin, 900 m, holotype ♂, 20 April 1962. Moreover, two females from NEW BRITAIN: Yalom, 1000 m, 21—22 May 1962, which are doubtfully referred to the present species.

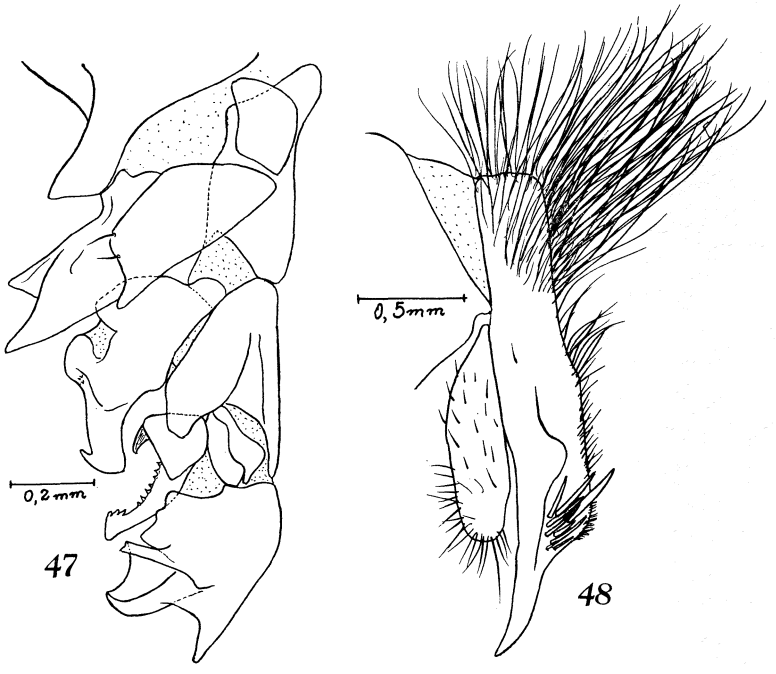
Tricholioproctia nigriventris sp. n. (Figs. 47 and 48).

M a l e : length 15 to 19 mm. Differs from *T. longistylata* sp. n. by the head and thorax less golden pollinose, the abdomen almost entirely black and the wings more infuscated along the veins. Front about 0,2 of width; ocellar bristles small; antennae reaching 0,88 of distance to vibrissae, third joint gray; facialia with hairs on lower half, the lower hairs long; genae with black hairs; hairs on lower parafacialia black and long; two or three series of black hairs on occiput besides postocular cilia. Presutural acrostichal bristles well developed; villosity of middle tibiae reduced, a ventral bristle present; dorsum of abdomen shining black, a pair of rounded gray spots near the hind margin of second tergite and a pair of triangular spots near the anterior margin of third tergite; lateral and ventral sides of abdomen with tesselated gray marks; no median marginal bristles on third tergite; fourth sternite with a large brush of hairs occupying all hind margin. Forcipes superiores almost straight, only the apical part curved; some spines near the apex,one of them greatly developed; forcipes inferiores very elongated; internal forcipes stout, palpi genitalium with double extremity; apical plate of paraphallus with two apical apophyses, ventralia heavily chitinized, with a curved distal point; styli of glans short and robust.

This species shows the male genitalia very similar to those of *T. flavinervis* (S. White), from which it differs by details of the apical plate and the ventralia.

T. magnifica Baranov from Solomon Is. has a similar colored abdomen, but the genitalia are entirely different.

Bismarck Islands. — MANUS: Lorengau, holotype ♂, 21 June 1962, paratypes 3 ♂, 16—21 June 1962.



Tricholioproctia nigriventris sp. n.
Fig. 47: penis and internal forcipes; fig. 48: external forcipes.

Boettcherisca atypica (Baranov, 1934).

Athyrsia atypica Baranov, 1934: 183, fig. 1.
Boettcherisca atypica: Lopes, 1961: 81.

Bismarck Islands. — NEW IRELAND: Danu, Kalili Bay, 3 ♂, 30 April 1962. — MANUS: Lorengau, 2 ♂, 1 ♀, 17—23 June 1962.

Boettcherisca karnyi (Hardy, 1927).

Sarcophaga karnyi Hardy, 1927: 454, fig. 7.
Boettcherisca karnyi: Lopes, 1961: 78, figs. 37—43.

Philippines. — TAWI TAWI: Tarawakan, 1 ♂, 1 ♀, 24 Oct. and 9 Nov. 1961.

Seniorwhitea orientalis (Parker, 1917).

Sarcophaga orientalis Parker, 1917: 94, fig. 3.
Seniorwhitea orientalis: Lopes, 1964: 165, figs. 11 to 22.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 10 ♂,

20 ♀, 15 Aug.—21 Sept. 1961. — BALABAC: Dalawan Bay, 3 ♀, 10—13 Oct. 1961.

Phalacrodiscus dahlianus Enderlein, 1928.

Phalacrodiscus dahlianus Enderlein, 1928: 18.
Phalacrodiscus dahlianus: Townsend, 1938: 54.

Bismarck Islands. — NEW BRITAIN: Rabaul, 1 ♂, 25 July 1962. — NEW IRELAND: Danu, Kalili Bay, 1 ♂, 1 ♀, 29 April 1962. — DYAUL: Sumuna, 4 ♂, 1 ♀, 5—13 March 1962.

Parasarcophaga subgenus **Pandelleisca** Rohdendorf, 1937.

Provisionally I enclose the following species in this subgenus, based on the features of the glans and the lateral arms of the apical plate of paraphallus. The glans is formed by a median bubble which has a pair of long, anterior processes easily visible, exceeding the lateral plates in side view. A similar structure is found in the American species *Wohlfartiopsis johnsoni* (Aldrich) (see Roback 1954, figs. 82, 84).

However, the species recorded here show the external plate joining the apical and lateral plates of the paraphallus. Heretofore, I never found a similar plate in the species of *Parasarcophaga.*

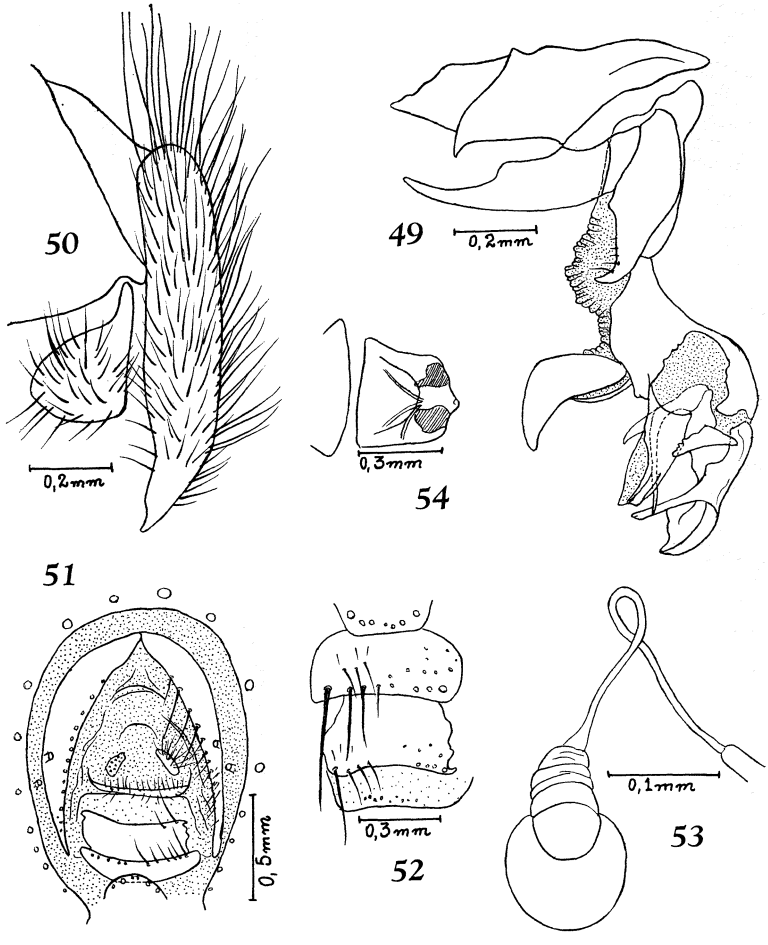
Probably *S. banksi* Senior-White described from the Philippines belong to this subgenus.

Parasarcophaga (Pandelleisca) lorengauensis sp. n.
(Figs. 49 to 54).

M a l e : length 7,5 to 8 mm. Front about 0,2 of head width. Head slightly yellowish, ocellar bristles moderately developed. Parafacialia with hairs and small bristles inferiorly, three frontal bristles below the base of antennae, the latter reaching 0,84 of the distance to vibrissae.

Presutural dorsocentral bristles developed, but presutural acrostichals not differentiated, four or five postsutural dorsocentrals, but only the two posterior ones well developed; ventral bristles on middle and hind tibiae present. R_{4+5} with hairs on two-thirds of the distance to cross-vein.

Abdomen with a pair of strong bristles on third tergite; sternites II to IV with long hairs which are very robust on the hind



Parasarcophaga (P.) lorengauensis sp. n.

Fig. 49: penis and internal forcipes; fig. 50: external forcipes; fig. 51: female genitalia; fig. 52: female genital sternites; fig. 53: spermatheca; fig. 54: signum.

margins. Forcipes superiores robust, gently curved forward, with pointed extremity; forcipes inferiores triangular; internal forcipes strong, forcipes interiores with small bristles near the apex; membranous region between theca and penis very much developed; paraphallus well chitinized, apical plate with a pair of arms attached to the apical half; lateral plate large, occupying the ventral side of the penis; a small triangular and dentate plate joining the apical and lateral plates; glans with a pair of ventral

apophyses; styli long and slender; ventralia composed of two well chitinized curved plates.

F e m a l e : front about 0,3 of head width; tergite VI plus VII dorsally incised; sternite VI plus VII with short hairs on hind margin; sternite VIII distally concave, with a long hair and some small ones on each side on posterior margin; sternite IX membranous with a little pile on the center of hind margin. Signum well chitinized, spermathecae showing a smooth rounded distal segment and a corrugated proximal one.

This species and the following, differ from the other species of the subgenus *Pandelleisca* by the presence of the small plate joining the apical and lateral plates of paraphallus.

Bismarck Islands. — MANUS: Lorengau, holotype ♂, 20 June 1962, allotype ♀, 24 June 1962, paratype ♂, 20 June 1962.

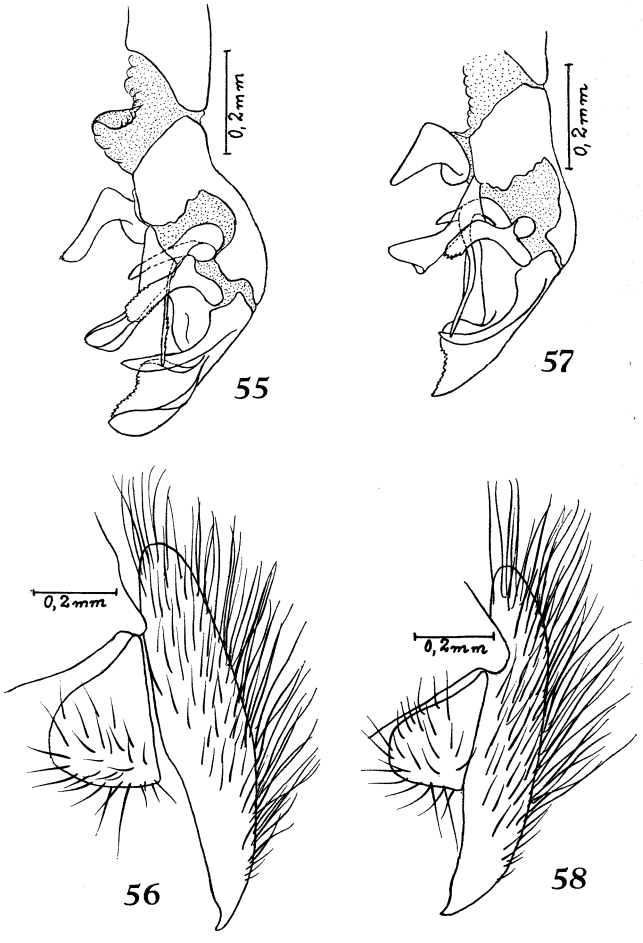
Parasarcophaga (Pandelleisca) insularis n. sp. (Figs. 55 to 58).

M a l e : length 8 to 9 mm. Front about 0,22 of head width. Head slightly yellowish; ocellar bristles moderate; parafacialia with bristled hairs below. Antenna reaching 0,88 of the distance to vibrissae.

Chaetotaxy of mesonotum, legs and abdomen, hairs of sternites as in *P. lorengauensis* n. sp. The differences in the male genitalia are as follows: apophysis of the apical plate inserted near base, lateral plate of paraphallus more chitinized, ventralia small, plate joining apical and lateral plates much more developed.

There are small differences between the flies from Lavongai (New Hannover) and from the Island of Dyaul. The paratype from Dyaul shows the head silvery, hairs of parafacialia and ocellar bristles smaller than those of the holotype. In the penis also there are small differences in the form of the apical plate and of the ventralia. Probably the populations of the two islands have been isolated for a long time (Petersen, 1966 p. 288) and it is possible that speciation is beginning.

Bismarck Islands. — LAVONGAI: Banatam, holotype ♂, 23 March 1962. — DYAUL: Sumuna, paratype ♂, 9 March 1962. There are also three females, two from Lavongai and one from Dyaul which should belong to this species.



Parasarcophaga (P.) insularis sp. n.

Fig. 55: penis (Lavongai); fig. 56: external forcipes (Lavongai); fig. 57: penis (Dyaul); fig. 58: external forcipes (Dyaul).

Parasarcophaga (s. str.) albiceps (Meigen, 1826).

Sarcophaga albiceps Meigen, 1826: 22,8.
Thyrsocnema albiceps, Baranov, 1936: 103, 104.
Parasarcophaga (s. str.) albiceps: Rohdendorf, 1937: 193, 199, 437, figs. 271, 276, 277.

Baranov, 1936, recorded this species from Solomon and Bismarck Isls. Specimens from Philippines I have examined are

gray, at most with slightly yellowish pollen, whereas the flies from Bismarck Isls. show entirely yellowish pollen, especially the females.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♀, 22 Aug. 1961; Pinigisan, 600 m, 1 ♀, 19 Sept. 1961; Tagembung, 1150 m, 1 ♀, 15 Sept. 1961. — BALABAC: Dalawan Bay, 19 ♂, 5 ♀, 8—13 Oct. 1961. — TAWI TAWI: Tarawakan, 2 ♂, 3 ♀, 10—13 Nov. 1961.

Bismarck Islands. — NEW BRITAIN: Valoka, 1 ♀, 13 July 1962; Yalom, 1000 m, 2 ♂, 4 ♀, 13—23 May 1962. — NEW IRELAND: Danu, Kalili Bay, 2 ♂, 1 ♀, 30 April 1962; Lemkamin, 900 m, 11 ♂, 6 ♀, 6—23 April 1962. — DYAUL: Sumuna, 1 ♀, 7 March 1962. — LAVONGAI: Banatam, 2 ♂, 6 ♀, 21—25 March 1962. — MANUS: Lorengau, 1 ♂, 8 ♀, 16—19 June 1962; Lombrum, 1 ♀, 29 June 1962.

Parasarcophaga (s. str.) orchidea (Boettcher, 1913).

Sarcophaga orchidea Boettcher, 1913: 375, fig. 1.
Parasarcophaga (s. str.) orchidea: Lopes, 1959: 58, figs. 56—59.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♂, 34 ♀, 19 Aug.—23 Sept. 1961. — BALABAC: Dalawan Bay, 4 ♀, 9—11 Oct. 1961. — TAWI TAWI: Lapid Lapid, 1 ♂, 23 Nov. 1961; Tarawakan, 5 ♀, 24 Oct.—13. Nov. 1961.

Bismarck Islands. — NEW BRITAIN: Valoka, 3 ♂, 13 ♀, 3—12 July 1962; Yalom, 1000 m, 9 ♂, 16 ♀, 8—23 May 1962. — NEW IRELAND: Danu, Kalili Bay, 2 ♀, 29—30 April 1962; Lemkamin, 900 m, 3 ♂, 11 ♀, 13—23 April 1962; Island near Kavieng, 1 ♀, 13 June 1962. — DYAUL: Sumuna, 9 ♀, 4—9 March 1962; Kollepine, 2 ♀, 12 March 1962. — LAVONGAI: Banatam, 11 ♂, 19 ♀, 17—26 March 1962. — MUSSAU: Talumalaus, 1 ♀, 5 February 1962; Boliu, 1 ♂, 1 ♀, 3 June 1962; Malakata, 1 ♂, 1♀, 9 June 1962. — MANUS: Lorengau, 2 ♀, 18—19 June 1962. — LUF (Hermit Islands): 7 ♂, 3 ♀, 26 June 1962.

Parasarcophaga (s. str.) knabi (Parker, 1917).

Sarcophaga knabi Parker, 1917: 96, fig. 4.
Parasarcophaga (s. str.) knabi: Lopes, 1958: 36, fig. 9.

Philippines. — PALAWAN: Brooke's Point, Uring, Uring, 18 ♂,

52 ♀, 15 Aug.—23 Sept. 1961. — BALABAC: Dalawan Bay, 2 ♂, 1 ♀, 10—13 Oct. 1961. — TAWI TAWI: Tarawakan, 4 ♀, 8—16 Nov. 1961. — MINDANAO: Sapamoro, Curuan District, 1 ♂, 1 ♀, 21 Dec. 1961.

Bismarck Islands. — NEW BRITAIN: Valoka, 2 ♂, 3 ♀, 4—8 July 1962; Rabaul, 1 ♀, 25 July 1962. — DUKE OF YORK: Manuan, 1 ♀, 18 July 1962. — NEW IRELAND: Danu, Kalili Bay, 1 ♂, 1 ♀, 29 April 1962; Lemkamin, 900 m, 21 ♂, 30 ♀, 6—21 April 1962. — DYAUL: Sumuna, 2 ♂, 1 ♀, 4—9 March 1962. — LAVONGAI: Banatam, 6 ♂, 26 ♀, 17—25 March 1962.

Parasarcophaga (Liosarcophaga) misera (Walker, 1849).

Sarcophaga misera Walker, 1849: 829.

Parasarcophaga (Liosarcophaga) misera: Lopes, 1959: 60, figs. 60-64.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♀, 23 Sept. 1961. — BALABAC: Dalawan Bay, 2 ♂, 9 Oct. 1961.

Bismarck Islands. — NEW BRITAIN: Bita Paka, SE of Kokopo, 1 ♂, 10 July 1962. — DYAUL: Sumuna, 1 ♀, 6 March 1962. — LAVONGAI: Banatam, 1 ♀, 19 March 1962. — MANUS: Lorengau, 4 ♂, 1 ♀, 23—25 June 1962.

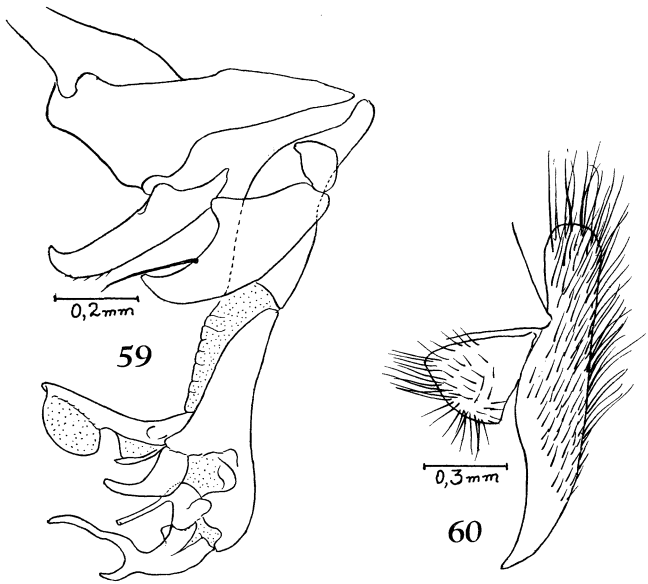
Parasarcophaga (Liosarcophaga) rohdendorfi Baranov, 1938.

Parasarcophaga rohdendorfi Baranov, 1938: 172, fig. 1 (Solomon Is.).

Bismarck Islands. — NEW BRITAIN: Valoka, 4 ♂, 2 ♀, 7—12 July 1962; Bita Paka SE of Kokopo, 1 ♂, 10 July 1962; Rabaul, 2 ♀, 25 July 1962. — DUKE OF YORK: Manuan, 2 ♂, 2 ♀, 19—20 July 1962. — NEW IRELAND: Danu, Kalili Bay, 1 ♀, 30 April 1962. — DYAUL: Sumuna, 3 ♂, 2 ♀, 4—9 March 1962; Kollepine 1 ♂, 12 March 1962. — LAVONGAI: Banatam, 2 ♂, 5 ♀, 19—22 March 1962. — MUSSAU: Malakata, 6 ♂, 4 ♀, 1 February and 3—10 June 1962. — MANUS: Lorengau, 4 ♂, 2 ♀, 20—29 June 1962.

Parasarcophaga (Liosarcophaga) promiscua n. sp.
(Figs. 59 and 60).

M a l e : length 9 to 12 mm. Head slightly yellowish, occiput and posterior part of genae silvery; front about 0,23 of head width; ocellar bristles poorly developed; three to four frontal bristles inserted below base of antennae; antennae reaching 0,84



Parasarcophaga (P.) promiscua sp. n.
Fig. 59: penis and internal forcipes; fig. 60: external forcipes.

of the distance to vibrissae; a series of long hairs on parafacialia; back of head with two sometimes incomplete series of black hairs besides the postocular cilia.

Thorax silvery; prescutellar acrostichal bristles present. Presuturaldorsocentral bristles differentiated; sometimes 4 to 5 hairs above, on the propleura; tibiae without long villosity, strong ventral bristle on hind pair; R_{4+5} with hairs on basal half of the distance to cross-vein.

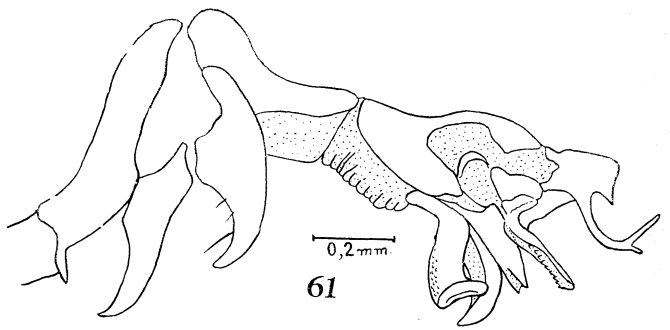
Abdomen silvery; sternites II to IV with small sparse hairs; genital segments black, the first with silvery, and posteriorly yellowish pollinosity, the second shining; forcipes superiores robust and slightly curved forward; forcipes inferiores almost triangular; internal forcipes black and strong; the forcipes interiores with a long bristle near apex; paraphallus well chitinized, apical plate with two arms, the proximal one very long, lateral plate well pigmented; ventralia long with a membranous rounded apical lobe; styli of glans slender.

F e m a l e : front about 0,28 of head width. Propleura rarely

with one or two small hairs above; genital tergite excised on the middle, dorsally without hairs on a small region; sternite VIII posteriorly concave, with group of hairs laterally on hind margin, sternite IX membranous.

This species is very similar to *P. (L.) walshi* Ho, 1938 and *P.(L.) pingiana* Hsieh, 1958, differing mainly in the shape of the apical plates and the ventralia.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, paratypes 1 ♂, 2 ♀, 25—31 Aug. and 10 Sept. 1961. — BALABAC: Dalawan Bay, paratypes, 1 ♂, 3 ♀, 8—12 Oct. 1961. — TAWI TAWI: Tarawakan, holotype ♂, 12 Nov. 1961, allotype ♀, 5 Nov. 1961, paratypes 1 ♂, 2 ♀, 25 Oct.—12 Nov. 1961.



Parasarcophaga (L.) aurifrons (Macquart).
Fig. 61: penis and internal forcipes.

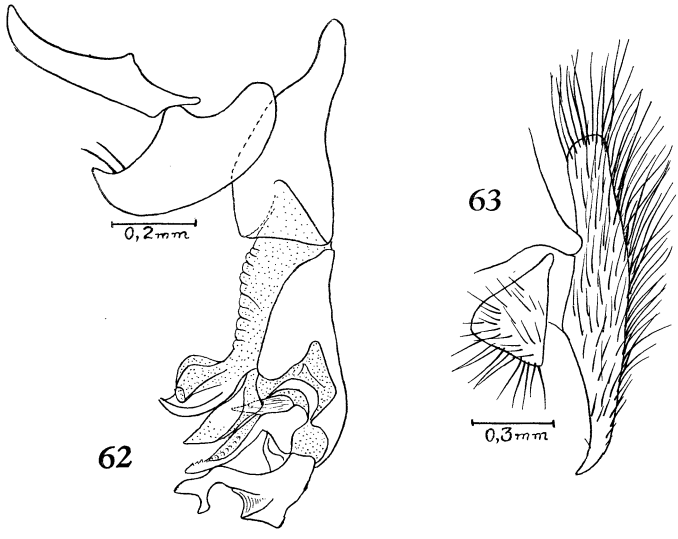
Parasarcophaga (Liosarcophaga) aurifrons (Macquart, 1845).
Sarcophaga aurifrons Macquart, 1845: 191.
Parasarcophaga (L.) aurifrons: Lopes, 1959; 62, figs. 70—77.

I present a drawing representing the penis of *aurifrons* from Lavongai (fig. 61), in which small differences in the ventralia appear when compared with specimens from Australia.

Bismarck Islands. — LAVONGAI: Banatam, 1 ♂, 23 March 1962.

Parasarcophaga (Liosarcophaga) juncta sp. n. (Figs. 62 and 63).

M a l e: length 9 to 11 mm. Body yellow, head golden yellowish; front about 0,2 of the head width; two or three bristles below



Parasarcophaga (L.) juncta sp. n.
Fig. 62: penis and internal forcipes; fig. 63: external forcipes.

base of antennae; parafacialia with long hairs, the inferior ones strong; hairs of facialia occupying a little more than inferior half; two series of black hairs on the occiput besides the postocular cilia.

Thorax with well contrasting longitudinal vittae; prescutellar acrostichal bristle absent; ventral bristle on middle and hind tibiae; R_{4+5} with hairs on the basal two-thirds of the distance to cross-vein.

Abdomen more intensely yellow on the last two segments; sternites II to IV with sparse hairs, which are more elongated on the margin of the sclerites. Forcipes superiores curved forward, internal forcipes robust the anterior with bristles near the apex; penis with the apical plate robust, with short bifid anterior arms; ventralia short and stout.

This species is similar to *aurifrons* Macquart, differing mainly by the shape of the apical plate and the internal forcipes.

Bismarck Islands. — NEW IRELAND: Lemkamin, 900 m, holotype ♂, 11 April 1962, paratypes 2 ♂, 22 April 1962.

Summary.

Thirty-one species are recorded from the southern Philippines and various islands in the Bismarck Archipelago. Taxonomic, distributional and other notes are given. One species from the Philippines is new to science (genus: *Parasarcophaga* (*Liosarcophaga*)), but especially the collection from the Bismarck Islands is significant. It contains fourteen new species in the following genera: *Heteronychia* (*Pandeleola*), 1 sp.; *Johnstonimyia,* 2 spp.; *Bezziola,* 4 spp.; *Tricholioproctia,* 4 spp.; *Parasarcophaga* (*Pandelleisca*), 2 spp., and *P.* (*Liosarcophaga*), 1 sp.

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Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 45.)

Deux Pterostichides (Coleopt. Carabidae) nouveaux de Palawan (Philippines).

Par
S. L. Straneo (Milan).

Trigonotoma philippinica n. sp.

♂. Longueur 27 mm; largeur 8,4 mm. Aptère. Surface supérieure d'un vert metallique assez clair; face inférieure noire, peu brillante; épipleures des élytres noires brillantes, avec des légers reflêts metalliques; pattes noires; palpes et articles 5—11 des antennes bruns ferrugineux.

Tête allongée, avec les yeux très modérément larges et bien convexes; sculptures profondes, impressions frontales un peu rugueuses. Antennes assez courtes, scape à peu près aussi long que le 2e et 3e articles reunis, plus court que les articles 3 et 4 reunis; articles 7 à 11 progressivement raccourcis.

Pronotum long 6 mm, large 7,3 mm; transverse, avec les côtés complètement arrondis, large antérieurement et à la base 5,3 mm; bord antérieur modérément échancré en arc; rebord latéral assez étroit en avant, épais et convexe; graduellement et modérément élargi et moins convexe dans la moitié basale; pore setigère antérieur immediatement en dedans du rebord latéral; pore sétigère postérieur placé près de l'angle basal, à moitié de la largeur du rebord; impressions basilaires larges, peu profondes et mal délimitées; toute la surface supérieure du pronotum est lisses et sans ponctuation.

Elytres en ovale modérément allongé; longueur 14 mm; largeur 8,4 mm; complètement striées; stries modérément profondes, presqu'indistinctement ponctuées; intervalles evidemment convexes à la base et à l'extrémité, peu convexes sur le disque.

Inferieurement proépisternes couverts de points fortement imprimés et assez denses; meso- et metépisternes et angles du metasternum fortement ponctués; premiers sternites ponctués sur les côtés; les 3 derniers sternites sont fortement rebordés à la base;

dernier sternite rebordé aux côtés, avec un pore sétigère de chaque côté.

Pattes regulières. Edéage peu courbé, conformé comme est indiqueé par l'esquisse (fig. 1).

♀ : inconnue.

Philippines. — PALAWAN: Mantalingajan, Tagembung, 1150 m., 17. IX. 1961, (mercury light 19.00—03.30), holotype ♂, exemplaire unique (Musée Zoologique de Copenhague); récolté par le Noona Dan Expedition (Petersen 1966: Ent. Meddr., 34: 283—304.

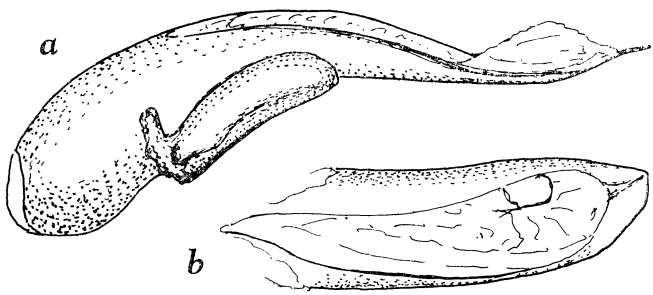

Fig. 1. Esquisse de la conformation de l'édéage de *Trigonotoma philippinica* n. sp. a) vue latérale; b) vue dorsale.

Par la conformation des antennes et les caractères fondementaux, cette espèce se rapproche de *T. venus* Tschitscherine, mais, en dehors de la coloration differente, présente des differences très grandes. Les sculptures de la tête sont plus fortes; le pronotum a les côtés complètement arrondis (chez *T. venus* légèrement subsinués vers la base); rebord latéral plus large, plus plat dans la moitié basale; le pore sétigère près de l'angle basal se trouve à moitié largeur du rebord latéral (chez *T. venus* à l'intéreur du rebord); élytres plus ovalaires, avec des sculptures plus fortes, intervalles plus convexes, surtout à la base et à l'extrémité; ponctuation des stries évidemment plus faible; les proépisternes sont fortement ponctués (chez *T. venus* presque lisses). *T. philippinica* se rapproche aussi de *T. luzonica* Chaud. que je connais seulement par la description, mais en diffère de prime abord par la coloration, qui est verte chez *philippinica* et cuivreuse ches *luzonica.*

Pediomorphus (?) anthracoides n. sp.

Longueur 5,5 mm; largeur 1,6 mm. Ailé. Noir, modérément brillant; pattes, parties buccales, antennes et une très petite partie du bord basal du pronotum d'un rouge ferrugineux assez clair; abdomen roussâtre.

Tête courte, trapue, autant large entre les yeux que le pronotum, aves deux pores sétigères juxtaoculaires, dont le postérieur assez deplacé à l'intérieur, graduellement retreci avec une courbure regulière vers le cou; yeux peu convexes, autant convexes que les tempes; impressions frontales courtes, bien évidentes, mais peu profondes.

Pronotum subcordiforme, petit, long 1,2 mm, large 1,1 mm; bord antérieur modérément échancré, angles antérieurs très peu proéminents, avec le sommet un peu arrondi; côtés modérément arrondis, subsinués avant la base; rebord latéral très étroite, linéaire, avec les deux pores sétigères reguliers, dont le postérieur près de l'angle basal. Base immarginée, sauf une trace de rebord tout près des angles qui sont considérablement avancés; à cause de cet avancement, les angles basilaires sont obtus, avec le sommet arrondi. Disque peu convexe, avec la ligne imprimée longitudinale médiane peu allongée; impressions basilaires assez évidentes, peu profondes, courtes, assez larges. Un peu avant la moitié de la longueur, de chaque côté de la ligne médiane, il y a un pore arrondi assez remarquable.

Elytres allongées, parallèles, deprimées; long. 3 mm, larg. 1,6 mm; complètement striées; striole scutellaire non developpée, remplacée par un pore à la base du 2^{e} intervalle; rebord humérale rudimentaire. 1^{r}, 3^{e}, 5^{e} et 7^{e} intervalle avec une série de 6—10 points sétigères; extrémité brièvement arrondie, déclivité apicale faible; série ombiliquée composée de peu de fouets, largement interrompue au milieu. Croisement des épipleures très reduit, ou absent.

Prosternum glabre, imponctué; appendice prosternale immarginée; metépisternes étroits et très allongés; sternites glabres, non sillonnés ou rebordés; sternite anal pourvu d'une ligne imprimée parallèle et proche du bord apical, avec 2—3 points sétigères très petits de chaque côté. Pattes modérément robustes, tarses antérieurs du ♂ fortement dilatés; les tarses intermediaires et postérieurs aussi sont evidemment dilatés, les intermediaires davantage;

tous les tarses sont pourvus de soies asez longues sur la face inférieure.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 14. VIII. 1961, (mercury light 19.00—21.00), 28 exemplaires dont l'holotype ♂ (Museé Zoologique de Copenhague). — BALABAC: Dalawan Bay, 5. X. 1961, 1 exemplaire.

Iles Bismarck. — MANUS: Lorengau, 24. VI. 1962, 2 exemplaires.

Tous les exemplaires recoltés par le Noona Dan Expedition. (Petersen, l. c.)

C'est avec beaucoup de perplexité que j'attribue provisoirement cette espèce au genre *Pediomorphus*. Elle présente une certaine affinité avec *P. elongatus* Sloane, d'Australie; mais *elongatus* est déja très different des *Pediomorphus* typiques (qui sont proches des *Fouquetius)*.

Le caractère de l'absence d'un croisement évident des épipleures des élytres (caractère qui se retrouve chez quelques *Pterostichus* abérrants) et la dilatation des tarses intermédiaires placeraient cette espèce près de certains Agonini sensu lato (p. ex. gen. *Phimus* d'Afrique); mais je ne connais pas de genre qui pourrait la comprendre. Par sa tête robuste, par le pore à chaque côté de la ligne longitudinale du pronotum, par les intervalles impaires pourvus d'une série de points, cette espèce s'éloigne des *Pediomorphus* que je connais. A première vue, elle semblerait se rapprocher de quelques Acupalpini (*Anthracus*) paléarctiques; mais il y a toujours les deux soies juxta-oculaires, caractéristiques des Pterostichini.

Je me repromets de reprendre l'examen de la position systhématique de cette espèce.

Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers Nr. 46).

The Erotylidae (Col.) collected by the Noona Dan Expedition in the Philippines and Bismarck Islands.

Studies on the Erotylid-beetles (18).

By
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The thirteen species recorded in this paper were collected by the Danish Noona Dan Expedition (see Petersen 1966: Ent. Meddr. 34:283—304) during the years 1961 and 1962 in the Philippines (11 species) and the Bismarck Islands (only 2 species).

In the Philippines collecting took place in the southwestern islands, Palawan, Balabac and Tawi Tawi, and all the species found are new to the fauna of these islands. The expedition did not take the only two species formerly recorded from these areas, viz. *Encaustes palawanica* Heller from Palawan and *Triplatoma exornata* Heller from Tawi Tawi. Three species and one subspecies are considered new to science and described below.

The Erotylid-fauna of Palawan, Balabac and Tawi Tawi is more closely related to the fauna of Borneo than to the fauna of the main islands of the Philippines. There are no species in common with Celebes (Zulawesi) with the exception of one species, *Episcapha quadrimacula* (Wiedemann) which has a wide distribution, however.

Subfamily **DACNINAE.**

Endytus bizonatus (Crotch).

Triplatoma bizonata Crotch, (1876), Cist. Ent., 1 (13): 406 (Borneo, Sarawak).

Philippines. — TAWI TAWI: Tarawakan, 1 ♂, 21 Oct. 1961, (Mercury light).

General distribution — Borneo (incl. Sawarak); Java; Sumatra; Burma (Tenasserim); Philippines (Tawi Tawi Is.).

Episcapha (Episcapha) quadrimacula (Wiedemann).

Engis quadrimacula Wiedemann, (1823), Zool. Mag., 2 (1): 132 (Java).

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 3 exs., 14 and 25 Aug. 1961; Pinigisan, 600 m., 5 exs., 21 and 23 Sept. 1961. — BALABAC: Dalawan Bay, 2 exs., 5 Oct. 1961 (Mercury light). — TAWI TAWI: Tarawakan, 1 ex., 12 Nov. 1961 (Malaise trap); Lapid Lapid, 2 exs., 21 Nov. 1961.

Gen. distr. — Indonesia (incl. Sarawak and N. Borneo); Malaya; Viet-Nam; Laos; Thailand; Burma; India; Ceylon; Philippines.

Episcaphula (Episcaphula) mediofasciata Heller.

Episcaphula (Episcaphula) mediofasciata Heller, (1918 (1920)), Arch. f. Naturg., 84 (8): 102—103 & 111, Taf. II, Fig. 49 (Nova Pommerania: Peninsula quae Gazelle nominatur).

Bismarck Isls. — NEW BRITAIN: Yalom, 1,000 m., 1 ex., 13 May 1962.

Gen. distr. — Bismarck Isls. (New Britain Is.).

Note: In comparison with the description and the figure shown in the original paper, the present example is larger (8.5 mm in the body-length) and the black parts of body are more reduced: head with the clypeus wholly dark reddish, the inter-antennal area piceous and the median part of inter-ocular area dark reddish; pronotum deep reddish, with a subtrapezoidal black marking from the median part of basal border to a little beyond the middle of disc and a small blackish spot at each side of the previous subtrapezoidal marking; scutellum almost black; elytra with the basal black part abbreviated longitudinally and deeply triangularly notched near the middle of its posterior part, the posterior black part forming an elongate obtriangular marking which is distinctly separated from the surrounding reddish parts; underside of prothorax with the black area concentrated mediobasally and the lateral parts broadly reddish.

Episcaphula (Episcaphula) newbritaina sp. nov.

Body elongate-oblong. General colour black, strongly lustrous; mouth-parts light red-brown to piceous, with the labrum (except the anterior marginal area piceous) and bases of mandibles black; tarsi blackish at base, lighter apically; each elytron with two (one basal and one subapical) red-brown markings; the

basal one distinctly separated from the scutellar region and also from the basal part of the sutural area of elytron, very closely approaching or nearly touching the middle of the basal border of elytron, not covering neither the humeral area nor the laterio-basal corner of elytron, it is close to the laterio-basal border of elytron, which is black, and the marking is nearly straight at its posterior border, but laterally somewhat produced posteriorly along the black border of elytron; the subapical marking close to the lateral black border of elytron, not reaching the sutural border, but closer to it than the basal marking, its anterior border gently and unevenly arched, the posterior border distinctly emarginate. In some specimens the basal segments or the whole antenna rather light to dark red-brown to piceous, the elytral markings more light brownish, the underside of body and the legs almost entirely light or dark brownish to piceous, or partly blackish and piceous.

Head slightly convex on the surface, distinctly ridged along the inner border of each eye, sulcated along the inner border of the ridge, somewhat raised near the antennal pore, obliquely striate just before the raised area, slightly emarginate at the front border of clypeus, rather strongly and closely punctured on the whole surface (these punctures uneven in size, especially finer on the posterior part of frons and on the anterior part of clypeus), very strongly and closely punctured on the post-ocular area. Eyes large, markedly convex and rather coarsely facetted. Antennae: 3rd segment much longer than the 2nd and 4th segments, 8th segment transverse subtrapezoidal and broader but shorter than the 7th segment; 9th—11th segment very strongly enlarged forming a loosely articulated club. Pronotum transverse, distinctly narrowed anteriorly with the sides gently rounded, the front corners markedly produced forwardly and the medio-basal part distinctly arcuately produced backwardly; front and basal borders immarginate with the exception of the lateral part of the former which is narrowly marginate; lateral borders distinctly marginate (these margins widened and bearing a setigorous pore at each corner); dorsum lightly convex, finely and rather closely punctured (each one of these punctures bearing an extremely fine hair, which is recognizable under a high power lens and is easily rubbed off) with some larger fovea-like punctures intermixed (these punctures more numerous in groups

at each side of the median part of base and with a tendency to be placed more closely on each side of the middle area of disc, although far more spread than in the basal groups (these larger punctures also provided with a hair in the centre). Scutellum much broader than long, gently emarginate at the basal border, subacuminated at the medio-posterior corner, flattish and extremely finely, but not very closely punctured on the surface. Elytra elongate, widest and gently arched outwardly at each post-humeral part and gradually narrowed posteriorly from there, rounded at the apex; dorsum moderately convex, but the lateral and apical margins reflexed, finely, closely and confusedly punctured on the whole surface (each one of these punctures bearing an extremely fine hair like the punctures of pronotum) and moreover with five files of rather larger punctures on the median area and an impressed line close to the posterior two-fifths of the sutural border; humeri slightly raised, impunctate.

Underside finely and closely pubescent-punctate; intercoxal area of prosternum distinctly marginate at each side (these margins strongly convergent, abruptly turned inward at the anterior ends, but not completely connected), distinctly and rather sparsely pubescent-punctate between these margins and markedly emarginate at the posterior border; intercoxal area of mesosternum transverse subtrapezoidal, rather sparsely but distinctly pubescent-punctate on the surface, distinctly marginate at each side (these margins each strongly widened anteriorly); metasternum with a central longitudinal suture from the basal border to near the middle of sclerite; mesocoxal lines absent; metacoxal lines present, but short. Legs as usual in structure and size, but the femora comparatively robust.

Length: 8.0 mm.

Bismarck Isls. — NEW BRITAIN: Yalom, 1,000 m., holotype and 3 paratypes, 11, 12 and 21 May 1962. Holotype and 2 paratypes in the Zoological Museum, Copenhagen; 1 paratype in my collection.

This new species is very closely allied to *E. novaeguineae* Heller from NE. New Guinea in general coloration and structure of body, but may be distinguished from it by the shape of the elytral maculations, the more dense distribution of the coarser punctures of the pronotum, the presence of the filed punctures on the elytra, etc.

Besides *E. novaeguineae* there are several allied species in New Guinea and its neighbouring islands, but the combination of the body-colour and the punctuation phase of pronotum and elytra, especially the presence of the filed punctures on elytra, distinguishes the new species from other known species.

Nesitis attenuata (Crotch).

Triplatoma attenuata Crotch, (1876), Cist. Ent., 1 (13): 405—406 (Borneo, Sarawak).

Philippines. — PALAWAN: Pinigisan, 600 m., 1 ♂, 3 Sept. 1961 (Mercury light). — TAWI TAWI: Tarawakan, 1 ♂, 2 ♀, 22—25 Oct. 1961.

Gen. distr. — Borneo (incl. Sarawak); Java; Sumatra; Nias; Perak; Philippines (Palawan Is. & Tawi Tawi Is.).

Note: The above-mentioned example from Palawan Is. differs from the typical form of this species from Borneo and also from the above-mentioned examples from Tawi Tawi Is. in the following points: body more strongly convex on the dorsum, more strongly curved downwardly at the posterior part, and more smooth and lustrous on the dorsum; pronotum more rounded at each side, mesosternum narrowed posteriorly, legs robuster, pronotum with a lunar red-marking at each anterio-lateral part; subbasal red-marking of each elytron narrower, more weakly dentate and not extending the basal border of elytron along the lateral border, two posterior red-markings rather weakly developed, etc. As it is well-known, however, this species is very variable in many points of the shape and structure of the body, and the different characters seen in the above-mentioned example from Palawan Is. may also be included in the range of individual variation in this species.

Triplatoma gestroi Bedel.

Triplatoma Gestroi Bedel, (1882), Ann. Mus. Civ. Stor. Nat. Genova, 18: 439 (Key) & 440, Tav. x, Fig. 4 (Sarawak).

Philippines. — TAWI TAWI: Tarawakan, 1 ♂, 24 Oct. 1961.

Gen. distr. — Borneo (incl. Sarawak); Sumatra; Philippines (Tawi Tawi).

Subfamily **TRIPLACINAE.**

Tribe ENCAUSTINI.

Aulacochilus sericeus Bedel.

Aulacochilus sericeus Bedel, (1871), Ann. Soc. Ent. France, (5) 1: 273 (Key) & 282—283 (Malacca & Malaisie).

Philippines. — Tarawakan, 6 exs., 22 Oct. (in fungus) and 2 exs., 23 Oct. 1961.

Gen. distr. — Borneo; Sumatra; Java; Malacca; Philippines (Tawi Tawi Is.).

Note: Arrow (Trans. Ent. Soc. London, (3—4): 300 (1922) and Fauna Brit. India, incl. Ceylon and Burma, Coleoptera-Clavicornia: 90 (1925) synonymized this species with *A. janthinus* Lacordaire (Monographie des Erotyliens: 250 (1842) (Java)), but these two species are separated from each other by many specific characters, especially they are easily distinguished by the punctuation-phase of the lateral parts of metasternum. And, at the same time, this fact may suggest that revisional works is needed for the examples recorded from India, Burma, Tonkin, etc. under the name of *A. sericeus* Bedel.

Tribe TRIPLACINI.

Amblyopus vittatus magnivittatus subsp. nov.

This new subspecies with the body broadly elliptical in outline, moderately convex on the dorsum, shining black in the general coloration (partly red-brown to piceous in various degrees in immature individuals), bimaculated on each elytron (Fig. 1 A) (sometimes these markings are more developed and connected with each other as shown in Figs. 1 B—D), is separated from the nominate form, *A. vittatus vittatus* (Olivier, 1807), by the following points: Body in general smaller (length 5.0—8.5 mm) and more finely punctured on the dorsum (especially on the interstices of the files of distinct punctures of elytra), 1st segment of the antennal club shorter and markedly transverse with its lateral borders not straight but distinctly rounded, pronotum more rounded at each side and more strongly narrowed in front with the front corners more strongly produced forwardly, elytra more weakly narrowed posteriorly at the post median part (nearly parallel-sided at the median part), elytral markings larger as

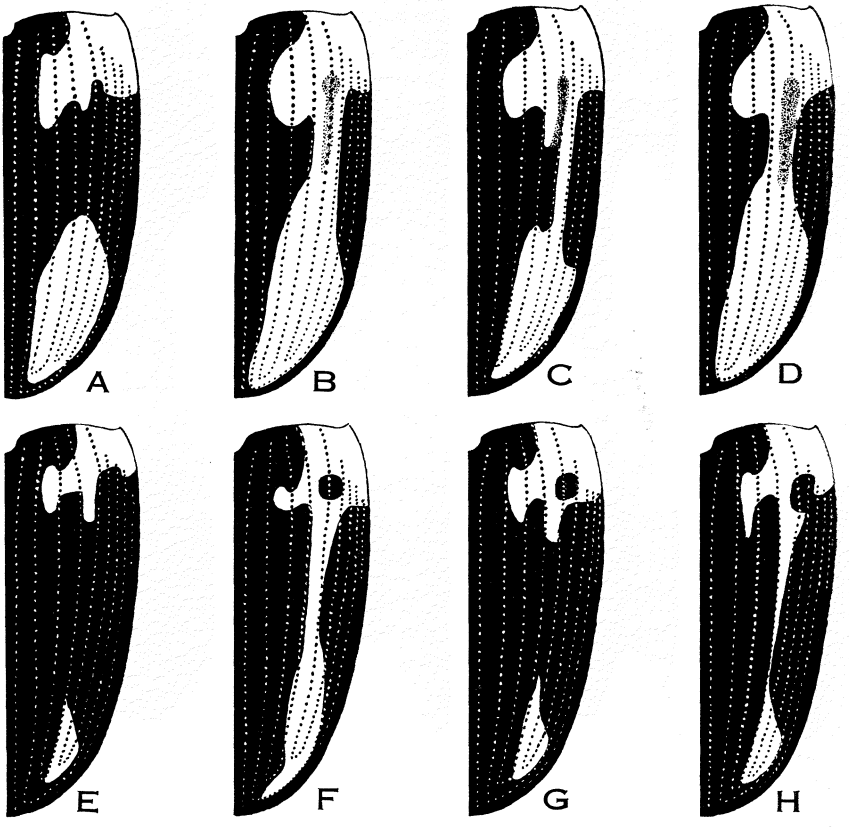


Fig. 1. *Amblyopus vittatus magnivittatus* subsp. nov. Different colour patterns of elytra.

shown in Fig. 1, and tibiae (especially the fore-tibiae) more strongly dilated terminally.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 8 paratypes, 20 Aug.—26 Sept. 1961; Pinigisan, 600 m., 3 paratypes, 3—22 Sept. 1961. — BALABAC: Dalawan Bay, holotype, 10 Oct., 7 paratypes, 8—13 Oct. 1961. All taken in Malaise traps. Holo- and paratypes in the Zoological Museum, Copenhagen; paratypes in my collection.

So far as can be judged from the present 19 examples, the form with two isolated red-brown markings on each elytron (Fig. 1 A) seems to be the typical one in this subspecies because 16 examples belong to this form.

Cyrtomorphus pardalinus Gorham.

Cyrtomorphus pardalinus Gorham, (1896), Ann. Mus. Civ. Stor. Nat. Genova, 36: 285—286 (Burma: Carin Chebà; Tenasserim: Mountains between Meekalan and Kyeat).

Philippines. — TAWI TAWI: Tarawakan, 1 ex., 16 Nov. 1961 (Malaise trap).

Gen. distr. — Burma; Java; Borneo; Philippines (Tawi Tawi Is.).

Note: The size of this species is somewhat variable, viz. Gorham (l. c.) recorded his examples as 5.0—7.0 mm in bodylength. Arrow (Fauna Brit. India, incl. Ceylon and Burma, Col.-Clavicornia: 111—112 (1925)) noted his examples as 5.0—6.0 mm, and the present example measures about 4.5 mm.

Spondotriplax bisbisignata sp. nov.

Body oval in shape, moderately convex on the dorsum. General colour black, lustrous; head piceous, with the vertex and the anterior part of labrum red-brown; maxillae and labium, together with their palpi, yellow-brown; antennae deep yellow-brown, with the five terminal segments black (except the apical half of 11th segment light yellow-brown); each elytron with two yellow-brown markings as follows; the 1st large subquadrate one on the base extending from the side to the 2nd file of distinct punctures completely covering the lateral and basal borders of the elytron together with the corresponding part of epipleuron, the 2nd subrotundate one between middle and apex of the elytron extending from the 2nd to a little beyond the 7th file of distinct punctures; underside dark red-brown to piceous, with the mesosternum and the median area of metasternum black; legs dark red-brown to piceous, with each tarsus lighter, especially the claw-segment and claws yellow-brown.

Head lightly convex as a whole, but rather flattish on the middle of frons, finely and rather closely punctured (these punctures finer and more closely placed on the anterior than on the posterior area), very narrowly but distinctly marginate at each side, dinstinctly notched at the front border of clypeus. Last segment of maxillary palpus subtrigonate, about twice as broad at the apical border as it is long. Antennae slender but short; 3rd segment longer than the two following segments united but clearly shorter than the next three together; club consists of five segments, but

the two basal ones are small (the first one obtrapezoidal, the second one transverse and much broader than the first), next two segments strongly expanded, and apical segment subrotundate and much narrower than any of the two preceding segments. Pronotum strongly transverse, about two and a half times as broad as long, nearly parallel-sided at the basal two-thirds but then gently convergent anteriorly with a gentle curvature; front border nearly straight at the median part, but laterally markedly produced anteriorly; lateral borders narrowly but distinctly marginate, markedly widened at each, basal and anterior, extremity with a fovea-like puncture in the middle of each; basal border distinctly emarginate at each side of the median part which is lobed posteriorly; dorsum transversely convex, distinctly and rather closely punctured, slightly depressed at each side of the basal median lobe and with a transverse row of large punctures in each of these depressions along the basal border. Scutellum nearly semicircular with the point adjoining the elytral suture acuminated, impunctate and flattish on the surface. Elytra moderately convex, with each humerus slightly convex and impunctate; each elytron with seven files of distinct punctures (these files disappearing at the apical area of elytron, the 1st file close along the sutural border), interstices of these files finely and closely punctured (the outermost interstice extraordinally broad in this species, but without even a trace of the 8th file — in other species the 8th file of punctures is seen in this place. Underside finely and rather closely pubescent-punctate (the punctures on the thorax coarser than those on the abdomen); intercoxal area of prosternum broad, widened posteriorly, narrowly but distinctly marginate at each side and emarginate at the posterior border, neither raised nor acuminated at the middle of the anterior marginal area; procoxal lines well impressed, extending to near the mid-point of the front border of coxae and anterior border of prosternum and then curving inwards but they keep widely separated from each other; meso- and metacoxal lines well impressed; legs moderate in their thickness and normally structured.

Length: nearly 4.0 mm.

Philippines. — MINDANAO: Curuan District, Sapamoro, 1 ex. Holotype, 21 Dec. 1961. In the Zoological Museum, Copenhagen.

This new species is easily distinguished from the known species of the genus in the phase of its elytral maculation. On the other

hand, the species is closely allied to *Tritoma coccinella* Heller, 1918 (1920), from Luzon, Philippines, in the coloration of the dorsum of the body, but Heller's species differs from the present species in the following points: Body larger (4.5 mm), the 2nd antennal segment as long as the four following segments together, pronotum strongly narrowed forwardly from the base, each elytron with eight files of distinct punctures, and prosternum subtuberculate at the middle of its anterior marginal area.

Tritoma bisignata sp. nov.

Body oval, rather lightly convex on the dorsum. General colour red-brown, lustrous; antennal club infuscated, with the exception of the yellowish terminal half of apical segment; median part of each elytron with a subquadrate black marking which extends from the 4th file to the 7th file of distinct punctures and widens outwardly.

Head lightly convex, finely punctured, the punctures larger and sparser on the posterior area than on the anterior area, very narrowly emarginate at the front border of clypeus. Antennae slender but short; 3rd segment elongate and a little shorter than the three following segments together, 8th segment transverse but small, 9th and 10th strongly transversely expanded, 11th subrotundate and a little narrower than the 10th. Pronotum transverse, nearly two and a half times as broad as long, narrowed anteriorly from the base (the basal half of lateral border straight, but the anterior half gently curved); front border deeply emarginate, with the median part gently arched forwardly; basal border somewhat produced backwardly with a distinct curvature; lateral borders narrowly but distinctly marginate, these borders somewhat widened at each end, and include a small fovea-like puncture in the centre of each widened part; dorsum transversely convex, finely and rather closely punctured, these punctures larger and rather more sparsely placed on the median disc than on the lateral areas. Scutellum nearly cordiform, about as broad as long, straight at the basal border, flat on the surface with some minute punctures. Elytra moderately convex on the dorsum; each elytron with seven files of distinct punctures (these files become rather indistinct at the posterior part of the elytron, the 7th file, very short, consisting of much finer punctures than the other files), interstices between these files finely and rather closely punctured. Underside finely

but not closely pubescent-punctate, these punctures coarser on the lateral areas and finer on the median area; prosternum distinctly and closely pubescent on the median area; anterior median area neither raised nor acuminated at the middle of anterior border; procoxal lines short, straight, convergent forwardly but widely separated from each other at their apices; mesocoxal lines long, but metacoxal lines very short. Legs moderate in size.

Length: 3.5 mm.

Philippines. — TAWI TAWI: Tarawakan, 1 ex. Holotype, 7 Nov. 1961 (Malaise trap). In the Zoological Museum, Copenhagen.

This new species is easily separated from the known species of the genus by its unique coloration of the body, especially by the phase of elytral maculation, and it may be a very characteristic feature of *bisignata* that the central part of prosternum is very closely pubescent.

Tritoma marginicollis sp. nov.

Body very small, oval, moderately convex on the dorsum. General colour deep yellow-brown, lustrous; antennae with the 8th segment piceous, the 9th and 10th segment black, and the 11th segment black at the basal half and yellowish at the terminal half; prosternum black at the middle; elytra black; meso- and metathorax red-piceous to dark piceous.

Head broad but very short, lightly convex, finely but sparsely punctured, narrowly but distinctly marginate at each side and also at the front border of clypeus which is distinctly emarginated. Last segment of maxillary palpus about four times as broad as long. Antennae short; 3rd segment somewhat longer than the two succeeding segments together, 8th segment transverse but very much smaller than the club segments, 9th and 10th segments strongly transverse, 11th only a little broader than long with the outer borders rounded. Pronotum transverse, about two and a half times as broad as long, gradually narrowed anteriorly (lateral borders mostly straight, but anteriorly distinctly curving inward, narrowly but distinctly marginated along the whole border (lateral borders somewhat broader than the front and basal borders); front border deeply emarginated, with the median part nearly straight; basal border with the median part strongly produced backwardly with a strong curvature. Dorsum distinctly convex from side to side, finely but sparsely punctured, narrowly but

distinctly grooved along the lateral borders, including a row of punctures in each one of these grooves; the four corners each with a large puncture. Scutellum cordiform with the basal border straight, flat on the surface with a few minute punctures. Elytra moderately convex, with the humeri not evidently raised; each elytron with six files of distinct punctures which become indistinct at the posterior part (the 1st, 8th and 9th files of distinct punctures which are seen in many species of this genus are not recognized in this species), interstices of these files of distinct punctures strongly, rather closely and confusedly punctured except on the lateral marginal area (these interstitial punctures a little finer than the filed punctures on the inner disc); elytral epipleuron impunctate and smooth, broad and gently narrowed posteriorly at the basal half, but strongly narrowed posteriorly at the posterior half. Underside rather coarsely and sparsely pubescent-punctate; prosternum somewhat raised longitudinally at the middle, sharply angulate at the middle of front border, almost lacking the procoxal lines; mesosternum strongly transverse, obtrapezoidal, narrowly but distinctly marginate at the front- and lateral borders; meso- and metacoxal lines distinct. Legs short and robust.

Length: 2.5 mm.

Philippines. — TAWI TAWI: Tarawakan, 1 ex. Holotype, 24 Oct. 1961. In the Zoological Museum, Copenhagen.

The present new species is easily distinguished from the known species of the genus by its small body, unique coloration and some other characteristic structural details, especially by the pronotum completely marginate all the way round the borders and by the structure of prosternum.

Tritoma postica (Crotch).

Cyrtotriplax(?) postica Crotch, (1876), Cist. Ent., 1 (13): 462—463 (Sarawak).

Philippines. — TAWI TAWI: Tarawakan, 3 exs., 23 and 30 Oct. and 14 Nov. 1961 (Malaise traps).

Gen. distr. — Borneo (Sarawak); Philippines (Tawi Tawi Is.).

Note: The present examples differ from the original description in the following points: Head more or less infuscated at the middle of face; pronotum more or less infuscated at the middle of anterior marginal area; in one example elytra mostly black with the apical area yellow-brown like the form described originally, but

the second example has the basal half of elytra black and the posterior half yellow-brown, and in the third one the basal one-third of elytra is black and the posterior two-thirds yellow-brown; meso- and metacoxal lines present (a compasison with the type-specimen may be needed in case of this character which is described as "linea coxali nulla" in the original description).

Summary.

Thirteen species are recorded. From the Philippines three species of the genera *Spondotriplax* and *Tritoma,* and one subspecies of *Amblyopus vittatus* are new to science. One new species is described from the Bismarck Islands (New Britain), genus *Episcaphula.*

ANMELDELSE

Eduard Wagner: Wanzen oder Heteropteren. II. Cimicomorpha. — Die Tierwelt Deutschlands und der angrenzenden Meeresteile etc. 55. Teil. 179 sider + 114 textfigurer. Jena 1967. Pris DM 32,40.

Et år efter udgivelsen af første bind af heteroptererne i »Tierwelt Deutschlands«, omhandlende gruppen *Pentatomorpha* inden for landtægerne (Geocorisae), (se anm. i Ent. Medd. Bd. 34 (4), side 281), foreligger nu fra samme forfatters hånd andet bind af de planlagte tre. I dette gives en nybearbejdelse af de fleste familier inden for gruppen *Cimicomorpha* (Tingidae, Reduviidae, Nabidae, Cimicidae, Anthocoridae etc.), samt rettelser og tilføjelser til det tidligere udkomne bind om den artsrige familie Miridae (Tierwelt Deutschlands, 41. Teil, 1952).

For de nye afsnit i bogen gælder stort set den samme ros og de samme indvendinger, som fremførtes i anmeldelsen af første bind. Tegningerne er talrige og illustrative. Man bemærker især figurerne med »tværsnit« af pronotum i afsnittet om familien Tingidae (»masketæger«); en utraditionel, men effektiv illustration af den i reglen meget komplicerede thorax-struktur hos disse tæger.

Rettelserne til Wagner's førnævnte bind om familien Miridae optager alene ca. 50 sider! Et godt eksempel på, hvor hurtigt systematiske arbejder bliver forældede. De fleste af rettelserne er tilmed resultatet af forfatterens egne arbejder og består overvejende af tilføjelse af nye arter, omgrupperinger osv. Et par af de foretagne ændringer forekommer dog anmelderen uberettigede. Det gælder f. eks. rehabiliteringen af *Blepharidopterus brevicornis* (E. Wagner, 1947), der af Wagner nu betragtes som en underart af *B. angulatus* (Fall.), skønt Leston (1958, Proc. S. Lond. Ent. Soc.) på meget overbevisende måde har vist, at *brevicornis* er en forma af den således dimorfe art *angulatus,* kun

optrædende hos hannen, men forekommende på samme træ som nominatformen. Skønt Wagner mener at have fundet de samme forskelle (antenne- og bagtibia-længde) hos hunnen, kan der i hvert fald ikke blive tale om to underarter, hvis man, som almindeligt accepteret, kræver en geografisk adskillelse eller i det mindste en tydelig økologisk forskel mellem sådanne. Det polytypiske artsbegreb synes i det hele taget ikke at være benyttet i megen moderne europæisk heteropterologisk litteratur. Underarter oprettes ofte, hvor forskellen mellem to former er så lille, at forfatteren viger tilbage for at give dem artsstatus. Det gælder efter anmelderens mening også underarterne af *Teratocoris saundersi* Dgl. & Sc., *s. saundersi* og *s. unicolor* E. Wagner, 1965, som også findes i de samme geografiske områder (i Danmark endog på samme lokalitet), uden en tydelig økologisk adskillelse. Det forekommer anmelderen, at man overser, at individuel variation også kan optræde med store spring mellem formerne, jvfr. eksemplet med *Blepharidopterus*. Den kendte vingepolymorfi er netop inden for tæger en meget udbredt form for en sådan diskontinuerlig variation.

Med de nævnte forbehold, som ikke angår det anmeldte binds brugbarhed som bestemmelsesværk, synes andet bind af tægerne i »Tierwelt Deutschlands« fuldt ud at imødekomme de forventninger, som rejstes ved værkets begyndelse sidste år. *N. Møller Andersen.*

Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 47.)

Philippine Carabidae (Col.) collected by the Noona Dan Expedition.

By
C. J. Louwerens (Hilversum).

I have to thank Dr Børge Petersen (Universitetets Zoologiske Museum, København), who was kind enough as to submit to me for study the Carabidae collected by the Danish Noona Dan Expedition to the Philippines and the Bismarck Islands in 1961 and 1962 (Petersen 1966).

I am much obliged too to Prof. P. J. Darlington Jr (Cambridge, U.S.A.), Ing. Jedlicka Arnost (Praha), Mr. R. D. Pope (British Museum, London), Dr Shun-ichi Uéno (Tokyo) and Prof. S. L. Straneo (Milano) for their kind help and advice, which they all readily gave me, when asked for.

This paper contains the descriptions of two new species from the Philippines and an enumeration of all Philippine species collected (except two species described by Straneo 1967), with a few notes as to geographical distribution, etc.

A second paper will deal with the Carabidae brought home from the Bismarck Islands.

The arrangement of the species examined is alphabetical.

It is to be understood, that all specimens are collected in the second half of 1961, most of them caught by Mercury light or in Malaise traps.

Subfam. **Scaritinae.**

Clivina vulgivaga Boh.

(Eugenie's Resa, Zool. Inst. IV. Col. 1861, p. 9).

BALABAC: Dalawan Bay, 1 sp., 8. X.

The small species is, so far I know, restricted to the Philippines.

Subfam. **Bembidiinae.**

Armatocillenus yokohamae Bates
(Tr. Ent. Soc. Lond. 1883, p. 268).

PALAWAN: Brooke's Point, Uring Uring, 36 sp. 14. VIII. — BALABAC: Dalawan Bay, 21 sp. 4. X and 2 sp. 5. X.

Through the kindness of Dr Shun-ichi Uéno I was able to examine 4 typical specimens of *yokohamae* of Japan. The Philippine specimens (Fig. 1) are extremely like *yokohamae* in size

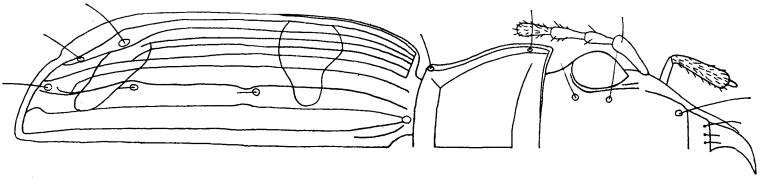


Fig. 1. *Armatocillenus yokohamae* Bates, of Palawan, left side.

as well in color, but most of them also bear an ill defined apical spot on the elytra. They differ only slightly in the shape of the pronotum. In *yokohamae* the pronotal anterior angles are more advanced and the sides of the pronotum a little more contracted behind. In my opinion the differences are of minor importance.

Also in Japan.

Tachys fumigatus Motch. (Bull. Soc. Imp. Nat. Mosc. 1851, p. 509).

PALAWAN: Brooke's Point, Uring Uring, 1 sp. 14. VIII. — TAWI TAWI: Tarawakan, 1 sp. 15. XI; Lapid Lapid, 1 sp. 19. XI.

Readily recognizable by the deeply emarginate labrum and clypeus and by the long, deep frontal furrows.

A variable species with an enormous distribution extending throughout South East Asia including the Malay Region and the Philippines. Also in Japan, Formosa, New Guinea and Africa.

Tachys impressipennis Motch. (Et. Ent. 1859, p. 39).

PALAWAN: Brooke's Point, Uring Uring, 31 sp. 14. VIII and 3 sp. 21. VIII. — TAWI TAWI: Tarawakan, 1 sp. 21. X, 5 sp. 11.—15. XI.

Common throughout South East Asia with the exception of Japan. Also in Australia.

Tachys klugi Nietn. (Ann. Mag. Nat. Hist. 1859, p. 423).

PALAWAN: Brooke's Point, Uring Uring, 2 sp. 14. VIII. — BALABAC: Dalawan Bay, 1 sp. 4. X. — TAWI TAWI: Tarawakan, 1 sp. 14. XI.

Range: throughout South East Asia including Japan.

Tachys klugi Nietn. var. **sulcatopunctatus** Putz.
(Ann. Mus. Civ. Stor. Nat. Gen. 1875, p. 742).

PALAWAN: Brooke's Point, Uring Uring, 1 sp. 14. VIII. — BALABAC: Dalawan Bay, 1 sp. 4. X.

Also in Sumatra, Java, Celebes and Andonare Isl.

Differs from the typical form in the unspotted elytra.

Tachys quadrillum Schaum (Berl. Ent. Zeit. 1860, p. 201).

PALAWAN: Brooke's Point, Uring Uring, 135 sp. 14.—23. VIII.

A common and variable species occuring from India, Ceylon and southern China to New Guinea.

Tachys singularis Andr.
(Ann. Mus. Civ. Stor. Nat. Gen. 1925, p. 393).

PALAWAN: Brooke's Point, Uring Uring, 9 sp. 14. VIII. — TAWI TAWI: Tarawakan, 1 sp. 14. XI.

Also in Celebes and the Bismarck Archipelago (Noona Dan Expedition).

This species is very much like *yunnax* Darl., originally described from Dominican Republic by P. J. Darlington Jr (1939) and also occuring in New Guinea and the Aru Isl. (Darlington, 1962). Through the kindness of Prof. Darlington I was able to compare the specimens of the Philippines and the Bismarck Isl. with 2 paratypes of *yunnax* from Sánchez, Dominican Republic. After careful examination I could not find sufficient differences to recognize two species. Nevertheless it is possible, that *yunnax* and *singularis* are different. According to Darlington (1962) *yunnax* is slightly larger than *singularis,* with more prominent eyes and relatively slightly wider prothoracic base.

Tachys umbrosus Motch.
(Bull. Soc. Imp. Nat. Mosc. 1851, p. 507).

MINDANAO: Sapamoro, Curuan district, 3 sp. 20. XII.

Throughout South East Asia except Japan. In India it is confined to the Hymalayans. Also in New Guinea and the Solomon Isl.

Limnastis pilosus Bates

(Ann. Mus. Civ. Stor. Nat. Gen. 1851, p. 296).

TAWI TAWI: Tarawakan, 2 sp. 20. X, 10 sp. 13.—15. XI; Lapid Lapid, 3 sp. 19. and 21. XI.

Common and widely distributed in India, Formosa, Tonkin, the Greater Sunda Isl., the Philippines, the Moluccas, New Guinea, eastern Australia and New Britain.

Subfam. **Trechinae.**

Perileptus sp.

The expedition collected two specimens of the same species. According to Dr Shun-ichi Uéno, to whom I sent them for examination, they are very close to a new species that will be described in his forthcoming revision of the West Pacific species of Perileptini, and may probably be the same species.

Subfam. **Pterostichinae.**

Besides the two new species, described by Prof. Straneo (1967), the following species are collected:

Lesticus sp. near **gregori** Kuntz. (Ent. Rundsch. 1911, p. 175).

PALAWAN: Mantalingajan, Tagembung, 1150 m, 1 sp. 17. IX.

Identified by Prof. Straneo. *L. gregori* is only known from the Philippines.

Trigonotoma palavanica Tchitch.

(Hor. Soc. Ent. Ros. 1900, p. 184).

BALABAC: Dalawan Bay, 6 sp. 5.—9. X.

Confined to the Philippine Isl.

Subfam. **Anchomeninae.**

Euplenes viridis Andr. (Treubia 1933, p. 282).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 6 sp. 5.—9. IX. — BALABAC: Dalawan Bay, 5 sp. 7.—13. X.

Also in Java, Celebes and Amboina Isl.

In all specimens examined the elytra are bluish green with the

underside and the legs much darker than in the typical form. Nevertheless I think they belong all to *viridis*.

Dicranoncus quadriens Motch. (Et. Ent. 1859, p. 32).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 3 sp. 1.—9. IX.

Commonly met with from Assam, India, Burma, Andaman Isl. to the Malay Peninsula and Archipelago. Also in Indo China.

Colpodes obscuritarsis Chaud. (Ann. Soc. Ent. Fr. 1878, p. 375).

PALAWAN: Brooke's Point, Uring Uring, 2 sp. 19. and 20. VIII.

Also in Rangoon, Java, Sumatra and Borneo.

Colpodes salsus Jedl.
(Sb. ent. odd. Nar. Mus. V Praze 1934, p. 190).

TAWI TAWI: Tarawakan, 1 sp. 23. X.

So far as I know only known from the Philippine Isl.

Colpodes saphyrinus Chaud. (Ann. Soc. Ent. Fr. 1878, p. 366).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 17. IX.

Also in Penang, Laos, Sumatra, Java, Borneo, Celebes, Banguey and Tonda. The var. *sloanei* Maindron (Bull. Soc. Ent. Fr. 1908, p. 185) in Celebes, Amboina Isl. and New Guinea. (Darlington, 1952).

Colpodes sp.

BALABAC: Dalawan Bay, 1 sp. 13. X.

Notagonum (Colpodes) anceps Jedl.
(Sb. ent. odd. Nar. Mus. V Praze 1934, p. 197).

PALAWAN: Mantalingajan, Tagemburg, 1150 m, 1 sp. 17. IX.

Only known from the Philippines.

Notagonum (Colpodes) pereus Jedl.
(Sb. ent. odd. Nar. Mus. V Praze 1934, p. 185).

PALAWAN: Mantalingajan, Tagemburg, 1150 m, 2 sp. 19. and 20. X.

Confined to the Philippines.

Subfam. **Harpalinae.**

Platymetopus flavilabris F. (Suppl. Ent. Syst. 1798, p. 59).

PALAWAN: Brooke's Point, Uring Uring, 1 sp. 21. VIII. — BALABAC: Dalawan Bay, 1 sp. 4. X.

A variable species. In the specimens examined the femora and tibiae are dark. In one or more of its diverse forms it ranges from China and Japan through India and Ceylon and through the whole of the Malay Archipelago.

Oxycentropsis grandis Emd. (Arb. m. t. Ent. B. D. 1937, p. 116).

PALAWAN: Brooke's Point, Uring Uring, 1 sp. 14. VIII. — BALABAC: Dalawan Bay, 2 sp. 5.—8. X.

Also in Java.

The 3 specimens of the Philippines are a little smaller than the Javan form, the basal striole longer, basal foveae and sides of pronotum more densely and more finely punctate, the punctures not very distinct.

Stenolophus smaragdulus F. (Suppl. Ent. Syst. 1798, p. 60).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 3. IX.

A variable species both in size and the shape of the pronotum.

Undoubtedly the commonest Carabid beetle found in the East. It abundantly occurs throughout the whole of South East Asia from Japan in the North to Queensland in the South.

Stenolophus smaragdulus F. var. **quinquepustulatus** Wied. (Zool. Mag. 1823, p. 58).

PALAWAN: Brooke's Point, Uring Uring, 3 sp. 22. VIII. — BALABAC: Dalawan Bay, 15 sp. 4.—7. X. — TAWI TAWI: Tarawakan, 2 sp. 14. XI. — MINDANAO: Sapamoro, Curuan district, 1 sp. 15. XII.

As variable and common as the typical form and with the same enormous distribution.

Stenolophus sp.

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 14. VIII.

Trichotichnus sp

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 21. IX. — TAWI TAWI: Tarawakan, 2 sp. 20.—21. X.

Carbanus straneoi Louw. (Tijdschr. v. Ent. 1962, p. 142).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 3. IX; Tagembung, 1150 m, 1 sp. 19. IX. — TAWI TAWI: Tarawakan, 1 sp. 21. X.

Originally described from Amboina Isl.

Subfam. **Perigoninae.**

Perigona nigriceps Dej. (Spec. Gén. Col. 1831, p. 44).

BALABAC: Dalawan Bay, 2 sp. 5.—8. X. — TAWI TAWI: Tarawakan, 1 sp. 14. XI; Lapid Lapid, 1 sp. 19. XI.

Almost cosmopolitan but not yet recorded from Central and South America.

Perigona sp. 1.

TAWI TAWI: Tarawakan, 2 sp. 24. X.

Perigona sp. 2.

PALAWAN: Brooke's Point, Uring Uring, 1 sp. 22. VIII.

Perigona sp. 3.

TAWI TAWI: Tarawakan, 1 sp. 30. X.

Perigona is a difficult genus. Especially the small species of the genus hardly differ from one another and as to color most of them are rather variable.

Subfam. **Odacanthinae.**

Colliuris tenuis Andr. (Ann. Mag. Nat. Hist. 1926, p. 280).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 12. IX. — BALABAC: Dalawan Bay, 1 sp. 13. X.

Mr R. D. Pope of the British Museum kindly compared a specimen with Andrewes' type of *tenuis* and found the elytra of the specimens of the Philippine Isl. rather more strongly punctured and the legs and antennae darker. Perhaps it is no more than a local race.

Also in Sumatra and Borneo.

Ophionea interstitialis Schm.-Goeb. (Faun. Col. Birm. 1846, p. 21).

PALAWAN: Brooke's Point, Uring Uring, 3 sp. 21. VIII.

Range: India, Ceylon, Siam, China, Indo China, the Malay Peninsula and Archipelago.

Very commonly found, especially in the rice fields.

Ophionea nigrofasciata Schm.-Goeb. (Faun.Col.Birm. 1846, p.21).

BALABAC: Dalawan Bay, 3 sp. 4. X. and 1 sp. 8. X. — TAWI TAWI: Lapid Lapid, 1 sp. 21. XI.

Also a species with a very large distribution, generally less common than the preceding species. It ranges from India, Ceylon, Burma, Indo China, Hainan and Siam to the Malay States and Archipelago.

Andrewesia (*Odacantha* Payk., *Arame* Andr.) **apicalis** Chaud.
(Bull. Soc. Nat. Mosc. XLV, 1872, p. 408).

PALAWAN: Brooke's Point, Uring Uring, 4 sp. 14. and 21. VIII. — BALABAC: Dalawan Bay, 1 sp. 5. X.

Also in Thailand, Singapore and New Guinea.

Strikingly like *obesa* Andr. but the upperside greenish instead of bluish.

Subfam. **Callistinae.**

Chlaenius bimaculatus Dej. (Spec. Gén. Col. 1826, p. 301).

BALABAC: Dalawan Bay, 1 sp. 4. X.

The specimen of Balabac has the elytral spots larger and rounder than is the case in the Javan forms, but all species with a very large distribution are more or less variable.

Abundantly met with in Nepal, Bhutan, Sikkim, Laos, China, Annam, Yunnan, India, Ceylon and the Malay Archipelago.

Chlaenius tetragonoderus Chaud.
(Ann. Mus. Civ. Stor. Nat. Gen. 1876, p. 10).

BALABAC: Dalawan Bay, 2 sp. 7. and 8. X.

Also in China, Tonkin, Formosa, Andaman Isl., Malay Peninsula, Sumatra, Java and Amboina Isl.

Much less common than the preceding species.

Haplochlaenius femoratus Dej. (Spec. Gén. Col. 1826, p. 328).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 3. IX. — BALABAC: Dalawan Bay, 2 sp. 5.—12. X.

Also in Sumatra and Java.

A variable species as regards color of pronotum and legs. Jedlicka (1935) gives a key to the color varieties of this species. Fig. 2.

Haplochlaenius peterseni sp. n. (Figs. 3—5).

Color of head, segments 1 to 3 of antennae, underside and legs black; pronotum green and a little coppery at places; elytra dark violet; segments 4 to 11 of antennae brown. Shiny. Hind wings fully developed.

Length about 23 mm.

Head convex, measured over the moderately prominent eyes about as wide as prothoracic apex; labrum truncate; impressions in front uneven and somewhat rugose; antennae reaching about basal third; surface punctate, very finely and sparsely on vertex.

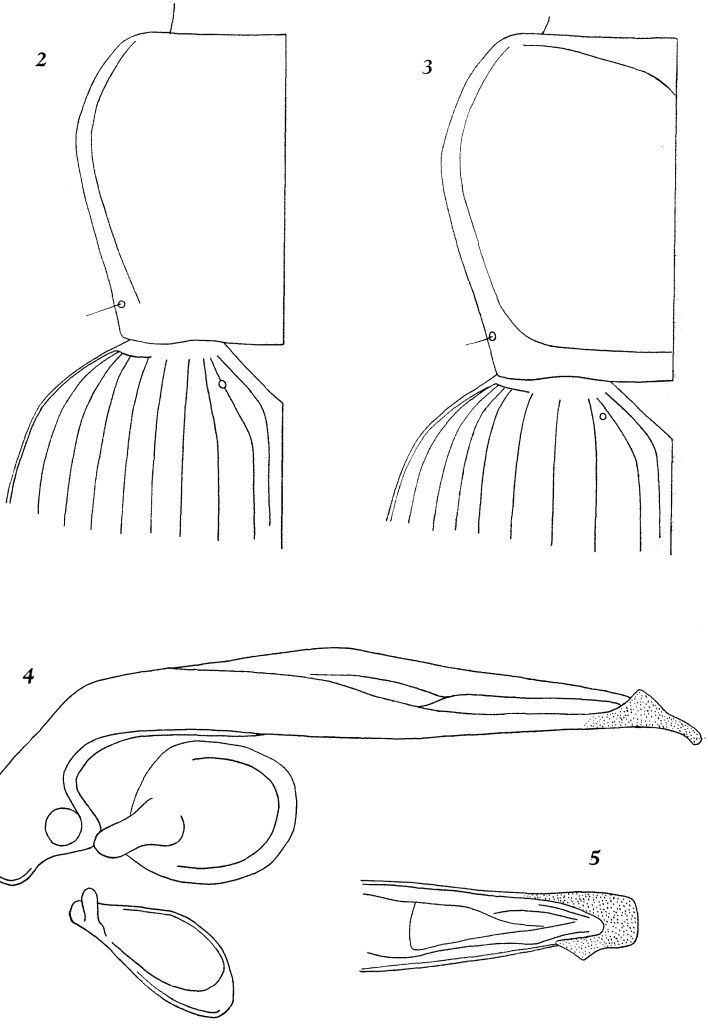


Fig. 2. *Haplochlaenius femoratus* Dej., of Java, left side of pronotum. —Figs. 3—5. *Haplochlaenius peterseni* sp. n.; (3) after a paratype of Palawan, left side of pronotum; (4) after the holotype of Palawan, aedeagus: left lateral view with right style removed; (5) the same, dorsal view of the apical part.

Pronotum convex, width at widest point/length over the median line about 1,50, the base a little wider than the apex; narrowly margined; from widest point, at about a third from apex, gently rounded in front, in an almost straight line contracted to hind angles, which are obtuse and a little rounded; anterior angles indistinct; apex practically not emarginate and for the greater part bordered; base almost right with the sides a little produced backwards, only bordered between the produced sides; the single lateral seta placed at a little distance from the hind angle; median line moderately deep, but less so in front and behind; transverse impressions slight; basal foveae large with a deeper impressed line at bottom; surface finely, transversely striate, the base at middle with closely placed, short grooves parallel to median line; the surface here and there with a few scattered punctures. Elytra convex, about twice as long as wide with gently rounded sides, widest a little behind middle; shoulders obliquely rounded; apex a little rounded without emargination; basal border incomplete, not reaching beyond stria 4, forming an obtuse angle with side border; striae finely impressed and extremely finely punctate; intervals 1, 3, 5 and 7 subcostate on basal half, the rest flat, moderately and moderately densely punctate, from each puncture springs a short, brown hair; the third interval without dorsal pores. Underside: tooth of mentum bifid; palpi truncate, a little stronger in the maxillaries, alike in the ♂ and in the ♀; penultimate segment of the latter plurisetose; prosternal process unbordered, setulose at apex; prosternum finely and sparsely punctate, stronger and more densely in the metasternum; side pieces of prosternum with a very few, very fine punctures; metipesterna a little longer than wide in front, bordered and rather densely punctate; ventral segments very finely punctate, each puncture bearing a fine, brown hair; ♂ protarsi dilated; claw segment haired at sides. Microsculpture isodiametric throughout.

Type material. — PALAWAN: Mantalingajan, Pinigisan, 600 m, holotype ♂, 10. IX, allotype ♀, 24. IX., paratype, 2. IX; Tagembung, 1150 m, paratype, 19. IX. In Zoological Museum, Copenhagen, and in my collection.

Named in honour of Dr Børge Petersen, member of the staff of the expedition.

Apart from color the shape of the pronotum is almost exactly

as in *H. femoratus,* but the puncturation of the intervals of the elytra, and the alternately subcostate intervals are quite different. Also near *flavofemoratus* Cast., which has violet elytra too, the pronotum cupreous and otherwise shaped, all intervals flat and likewise punctured as in the new species. *H. peltastes* Jedl., also from the Philippines, is differently colored and has the intervals of the elytra alternately costate.

Simous aeneus Laf. (Ann. Soc. Ent. Fr. 1851, p. 270).

BALABAC: Balabac Peak, 1 sp. 10. X.

Apparently a small, greenish form of *aeneus.* In size and build almost exactly like *nubilus* Andr., which is black instead of aeneous or greenish.

Also found in Java and Sumatra.

Subfam. **Panagaeinae.**

Craspedophorus sp.

PALAWAN: Brooke's Point, Uring Uring, 1 sp. 14. VIII.

I sent the specimen to Jedlicka Arnost for examination, who told me, that it is near *elegans* Dej. from India and Ceylon. I do not know *elegans* in nature. It tallies resonably well with *C. philippinus* Jedl., but it is smaller and the elytra appear to be relatively longer and narrower.

Microcosmodes flavopilosus Laf. (Ann. Soc. Ent. Fr. 1851, p. 222).

PALAWAN: Brooke's Point, Uring Uring, 5 sp. 14. VIII.

Also in China, Nepal, Tonkin, Formosa, Japan, Sumatra, Java and Amboina Isl.

A variable species as regards the size of the yellow markings on the elytra. Specimens of Java have the spots much larger. Sometimes the spots are wanting alltogether.

Subfam. **Orthogoniinae.**

Orthogonius sp. 1.

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 9. IX. — TAWI TAWI: Tarawakan, 20 sp. 23. X. —13. XI.

Orthogonius sp. 2, near **klickai** Jedl.
(Acta Soc. Ent. Praha 1935, p. 184).

TAWI TAWI: Tarawakan, 1 sp. 6. XI.

Orthogonius sp. 3, near **klickai** Jedl.

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 10. IX.

Orthogonius sp. 4.

PALAWAN: Mantalingajan, Pinigisan, 600 m, 10 sp. 5—23. IX.

Orthogonius sterbai Jedl.
(Acta Soc. Ent. Praha 1935, p. 185).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 3 sp. 2—6. IX.
Identified by Jedlicka Arnost.
Confined to the Philippines.

Actenoncus ater Cast. (Et. Ent. 1834, p. 48).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 10. IX.
Not very common and also known from Siam, Java and Borneo.

Subfam. **Pentagonicinae.**

Pentagonica erichsoni Schm.-Goeb.
(Faun. Col. Birm. 1846, p. 48).

BALABAC: Dalawan Bay, 1 sp. 11. X.
Also in Ceylon, Sikkim, Burma, Malay Peninsula, Sumatra, Borneo, Java, Great Sangir and Batchian.

Pentagonica philippinensis Jedl.
(Acta Soc. Ent. Praha 1934, p. 124).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 18. IX.
So far as I know confined to the Philippine Isl.

Pentagonica ruficollis Schm.-Goeb. (Faun. Col. Birm. 1846, p. 48).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 2 sp. 3. IX. — BALABAC: Dalawan Bay, 1 sp. 13. X. — TAWI TAWI: Tarawakan 1 sp. 25. X.
Range: Burma, Taiwan, Andonare Isl., Allor Isl., Tonkin, Java, Sumatra, Borneo, Gilolo, Timor, Amboina Isl. and Australia.

Subfam. **Lebiinae.**

Physodera eschscholtzi Parry.
(Trans. Ent. Soc. Lond. 1849, p. 179).

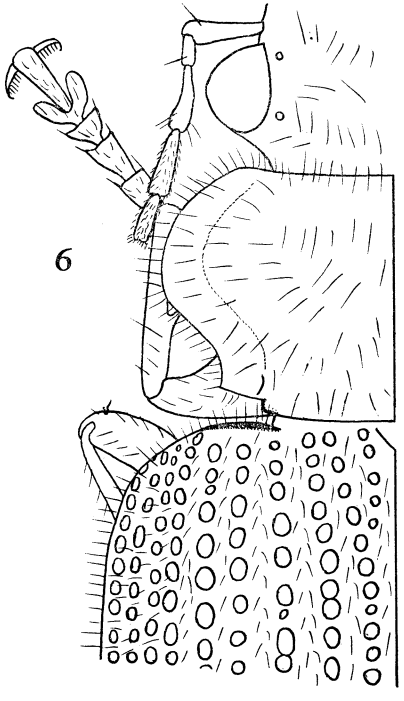
TAWI TAWI: Tarawakan, 3 sp. 23.—24. X.
A handsome species also occuring in India, Sikkim, Burma, Laos, Tonkin, China, Sumatra, Borneo and Java.

Lachnoderma polybothris sp. n. (Fig. 7).

Color of underside, head, pronotum, mouth parts, antennae and legs — except tarsi and partly tibiae, which are brown — black; elytra very dark metallic blue with a greenish tinge; ultimate segment of the palpi with a brown tip; upperside with whitish, rather long, not densely placed, erect hairs. Very shiny, also antennae and legs. Hind wings fully developed.

Length about 8 mm.

Head convex, with large, strongly prominent eyes; measured over the eyes much narrower than largest width of pronotum and about as wide as prothoracic base; the palpi truncate, a little stronger so in the labials; labrum slightly arcuate in front; clypeus a little emarginate; antennae short, reaching not far beyond base of elytra; the oblique genae as long as eyes; neck constricted be-



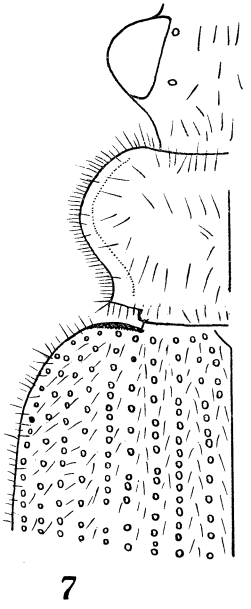


Fig. 6. *Lachnoderma nideki* Louw., after the type-specimen of Depok (Java), left side of head and pronotum. — Fig. 7. *Lachnoderma polybothris* sp. n., after the holotype of Balabac, left side of head and pronotum.

hind; two setae over the eyes on each side; frontal impressions large and round; surface uneven, covered with widely spaced, small punctures, each puncture bears a stiff, erect hair. Pronotum convex, cordiform; at widest point, at about middle, about as wide as long; the unbordered sides moderately explanate, strongly rounded in front, strongly emarginate at a fourth from base, which is produced backwards between the little oblique sides; apex very little emarginate, almost straight; anterior angles indistinct, practically rounded away; posterior angles almost right; median line finely impressed, obliterated in front and behind; transverse impressions little developed; basal foveae large and round; pronotal sides with a fringe of hairs; surface rather strongly uneven, sparsely punctate, the punctures bearing stiff, erect hairs. Elytra convex, with parallel sides; width/length about 0,80; shoulders squarely rounded; basal border incomplete, reaching inwards to about stria 4; apex truncate, with rounded outer angles; basal striole well developed; striae indicated by closely placed, large punctures; intervals wide and nearly flat; I can not detect any dorsal pores in the intervals because of the general pubescence. No microsculpture. Underside: prosternal process setulose at apex; prosternum including side pieces impunctate; venter pubescent, the short hairs more closely placed along the middle than at sides; fourth tarsal segment large, deeply lobed and closed beneath with densely placed, short, whitish hairs; claws pectinate.

BALABAC: Dalawan Bay, holotype ♀, 9. X. The single specimen in the Zoological Museum, Copenhagen.

In build surprisingly like *L. nideki* Louw. of Java, which is a much bigger insect, wholly black, also the tarsi, the elytra with a slight very dark blue tinge; elytra with relatively narrower intervals; the punctures indicating the striae much larger, etc. *L. nideki* was collected in 1949 at Depok, a little village in the neighbourhood of Bogor (formerly Buitenzorg) south of the capital Djacarta. The precise collecting place is a small rest of virgin forest in the plains of Java, which still existed in 1949, but I do not know for sure, how the situation may be at present.

The habits of the species of *Lachnoderma* seem to be arboreal. They are, generally speaking, poorly represented in collections sent for identification.

Calleida splendidula F. var. **rubricata** Motch.
(Bull. Soc. Imp. Nat. Mosc. 1864, p. 283).

TAWI TAWI: Tarawakan, 2 sp. 24. and 25. X.

Range: the whole of South East Asia, excluding Japan and New Guinea.

Anchista (Endynomena) discoidalis Bates?
(Ann. Mus. Civ. Stor. Nat. Gen. 1892, p. 423).

TAWI TAWI: Tarawakan, 1 sp. 10. XI.

As to the correct identification I feel not absolutely sure. Originally described under the generic name *Endynomena,* which has the sides of the pronotum setulose. According to Jedlicka Arnost (1963) it apparently belongs to the genus *Anchista* because the fifth interval of the elytra has a pore near base.

Also known from Assam? (Karen Hills)

Parena bicolor Motch. (Ann. Soc. Imp. Nat. Mosc. 1877, p. 207).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 22. IX.

Also known from Java and quite recently I saw an ex. from Amboina Isl.

The identification of this species is made after the redescription of *bicolor* by H. E. Andrewes (1928), which tallies well with the Philippine specimen, but there are differences, though of minor importance, I believe. The color of the elytra of the ex. of Palawan is metallic, greenish blue, intervals 1, 3, 5 and 7 are convex down the middle of the interval, the intervals are very minutely punctate. I can not detect any microsculpture on the elytra. In *bicolor* the color of the elytra is metallic green, vaguely cuprous at sides and apex, the intervals convex and impunctate and the microsculpture is vaguely isodiametric.

Microlestes inconspicuus Schm.-Goeb.
(Faun. Col. Birm. 1846, p. 41).

TAWI TAWI: Tarawakan, 1 sp. 24. X.

Also in Burma.

In build not unlike *ater* Andr. from Java, of which I could examine a cotype. Much smaller than *ater,* color of upperside blackish aeneous. The microsculpture in both species is about the same.

Risophilus stepaneki Jedl. (Acta Soc. Ent. Praha 1934, p. 168).

TAWI TAWI: Tarawakan, 1 sp. 23. X.

Confined to the Philippines.

Celaenephes parallelus Schm.-Goeb.
(Faun. Col. Birm. 1846, p. 78).

BALABAC: Dalawan Bay, 1 sp. 7. X and 1 sp. 9. X. — TAWI TAWI: Lapid Lapid, 1 sp. 19. XI.

A common species occuring in India, Ceylon, Andaman Isl., Indo China, Siam, Malay Archipelago, Bismarck Isl. (Noona Dan Expedition), New Caledonia, Australia and Samoa.

Subfam. **Coptoderinae.**

Coptodera andrewesi Jedl.
(Acta Soc. Ent. Praha 1934, p. 16).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 8. IX. — TAWI TAWI: Tarawakan, 4 sp. 22.—28. X and 1 sp. 16. XI.

Apparently confined to the Philippines.

At once recognizable by the sharply pointed outer angles of the elytra.

Coptodera eluta Andr. (Trans. Ent. Soc. Lond. 1923, p. 30).

MINDANAO: Sapamoro, Curuan district, 1 sp. 21. XII.

Range: India, Ceylon, Taiwan, Vietnam, Burma, Andaman Isl., Formosa and the Malay Archipelago.

Coptodera sp. near **interrupta** Schm.-Goeb.
(Faun. Col. Birm. 1846, p. 53).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 1 sp. 12. IX.

Smaller than *interrupta,* pronotum brown instead of black. The elytral markings of about the same shape and size.

Coptodera transversa Schm.-Goeb. (Faun. Col. Birm. 1846, p. 54).

PALAWAN: Brooke's Point, Uring Uring, 2 sp. 22. VIII.

Also in Java and Sumatra. Not very often met with.

Lioptera quadriguttata Chaud.
(Ann. Soc. Ent. Belg. 1869, p. 208).

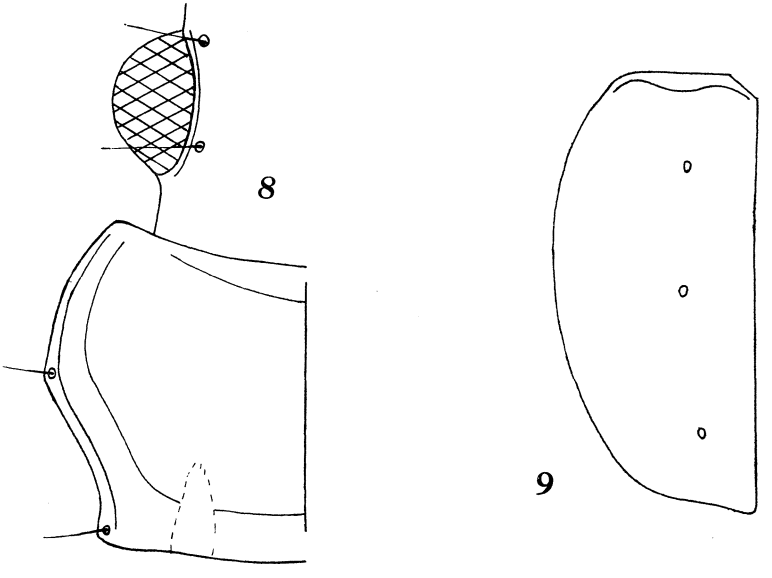
TAWI TAWI: Tarawakan, 1 sp. 23. X.

Confined to the Philippine Isl.

Dolichoctis striata Schm.-Goeb.
(Faun. Col. Birm. 1846, p. 62).

TAWI TAWI: Tarawakan, 1 sp. 23. X.

Much like *rotundata* Schm.-Goeb., which, according to Andrewes (1931) is only a variety of *striata*. In *rotundata* each elytron bears two rounded spots. Of *rotundata* I examined many specimens from the Greater Sunda Isl. and from New Guinea, all with fourspotted elytra, but it must be said, that in the genus *Dolichoctis* the spots are sometimes partly or wholly wanting. Also much



Figs. 8—9. *Dolichoctis gilvipes* Dej., after the type-specimen; (8) left side of head and pronotum. (9) left elytron.

like *gilvipes* Dej. The accompanying sketch (Fig. 8—9) of left half of pronotum and elytra is made after the type-specimen. The hind angles of the pronotum are almost right and the elytra have 3 dorsal pores in the third interval.

Distribution: Cochin State, Ceylon, Burma, Siam, Laos, Tonkin, Japan, Andaman Isl., Malay Peninsula and Archipelago, Aru Isl., Philippines, Amboina Isl., New Guinea and Australia.

Mochterus tetraspilotus Macl.
(Ann. Jav. 1825, p. 25).

TAWI TAWI: Tarawakan, 1 sp. 28. X.

A common species in India, Ceylon, Burma, Tonkin, Laos, Formosa, Andaman Isl., Malay Peninsula and Archipelago, Christmas Isl. and Samoa.

Subfam. **Pericalinae.**

Catascopus elegans Weber (Obs. Ent. 1801, p. 45).

PALAWAN: Brooke's Point, Uring Uring, 2 sp. 23. VIII.

A common and variable species occuring in India, Andaman Isl., Nicobar Isl., Indo China, Siam, Vietnam, the whole of the Malay Region, North Australia and New Britain.

Subfam. **Zuphiinae.**

Agastus lineatus Schm.-Goeb. (Faun. Col. Birm. 1846, p. 31).

TAWI TAWI: Tarawakan, 9 sp. 20. X.—15. XI.

Also known from Calcutta, Burma, Cochin-China and Cambodia.

Zuphium inconspicuum Schm.-Goeb.
(Faun. Col. Birm. 1846, p. 30).

TAWI TAWI: Tarawakan, 1 sp. 11. XI.

Also in India, Siam and Java.

Unfortunately the head of the specimen examined is missing. Compared with examples from Java with which it quite agrees as regards the shape of pronotum and elytra. The color is the same too.

Zuphium piceum Schm.-Goeb.(Faun. Col. Birm. 1846, p. 29).

TAWI TAWI: Tarawakan, 1 sp. 20. X.

Smaller than Javanese specimens with which it is compared, but of the same build and color. Sides of pronotum not so deeply emarginate behind and the hind angles not so strongly projecting.

Also known from Java.

Subfam. **Dryptinae.**

Drypta lineola Macl. (Ann. Jav. 1825, p. 27).

PALAWAN: Brooke's Point Uring Uring, 5 sp. 14. VIII and 1 sp. 21. VIII; Mantalingajan, Pinigisan, 600 m, 1 sp. 24. IX. — BALABAC: Dalawan Bay, 15 sp. 4. X. — TAWI TAWI: Tarawakan, 1 sp., 14. X.

A common species throughout South East Asia.

Desera geniculata Klug (Jahrb. Ins. 1834, p. 52).

BALABAC: Dalawan Bay, 2 sp. 4. X and 1 sp. 12. X.

A common species throughout South East Asia, including Japan.

Subfam. **Pseudomorphinae.**

Cryptocephalomorpha gaverei Rits.
(Tijdschr. v. Ent., Verslag, 1875, p. 93).

BALABAC: Dalawan Bay, 1 sp. 9. X.

Apparently an uncommon species and at first glance not very much like a Carabid beetle.

Also known from Singapore, Sumatra and Java.

Subfam. **Brachininae.**

Brachinus bigutticeps Chaud.
(Ann. Soc. Ent. Belg. 1876, p. 49).

PALAWAN: Mantalingajan, Pinigisan, 600 m, 13 sp. 3.—22. IX.

Also in Sumatra, Java, Borneo, Bali and Celebes.

As to size a very variable species. The specimens of the Philippines have the tibiae and tarsi darker, more piceous, but for the rest I can not see any more differences. Perhaps a variety.

Summary.

This paper contains the descriptions of two new species (in the genera *Haplochlaenius* and *Lachnoderma*) and an annotated list of 72 species collected by the expedition in southern Philippine islands. Some records are new to the Philippine fauna.

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Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 48).

A new species of Nycterimyia Lichtw. from New Britain (Diptera, Nemestrinidae).

By
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Zoological Museum, Copenhagen, Denmark.

The single specimen of the family Nemestrinidae collected by the Danish Noona Dan Expedition to the Philippines and Bismarck-Is. in 1961—62 (Petersen, 1966) has proved to represent an undescribed species of the remarkable genus *Nycterimyia* Lichtwardt, 1909. The genus has recently been reviewed by Paramonov (1953). Including the species described in the present paper eight species are known from the Indoaustralian region. The seven hitherto known species are: *N. dohrni* Wand. from Andaman Is., *N. kerteszi* Lichtw., *N. fenestro-clathrata* Lichtw. and *N. fenestro-inornata* Lichtw. from Formosa, *N. papuana* Beq. from New Guinea, *N. horni* Lichtw. and *N. commoni* Param. from Queensland. All the species are extremely rare flies, several of them represented by one specimen only.

The species described below as *N. septempunctata* n. sp. differs clearly from the other known species by the following combination of characters in wingpattern (cf. the key in Paramonov, l. c.: 245): Basal part of axillary cell with a large, hyaline spot near alula; alula brown; large hyaline spot present in discal cell; and, tip of wing without semi-hyaline spot.

Nycterimyia septempunctata n. sp.

Material:

Holotype, ♂, Bismarck Is., NEW BRITAIN: Yalom, 1000 m, 21 May 1962, Noona Dan Exp. 1961—62. In Zoological Museum, Copenhagen.

Description:

H e a d. The frontal triangle occupies about two-thirds of the distance from antennal bases to ocellar tubercle, being about 1.3

times as high as wide at level of antennal bases. The eyes are practically contiguous in upper third of the distance from antennal bases to ocellar tubercle. Eyes with large facets in upper part, small in lower part, the dividing line being rather sharp and situated at level of antennal bases. Ocellar tubercle very prominent with large ocelli. Antennae 1 mm long. First and second joints short, third joint distinctly thickened towards the apex, style not clearly separated (fig. 1). A pair of palpi as long as the pubescence is visible, but other mouthparts cannot be seen. — Frontal triangle,

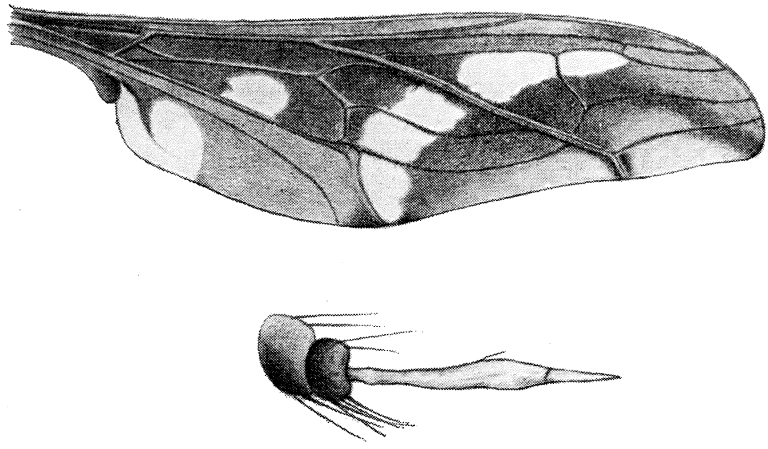

Fig. 1: Wing and antenna seen from inside of *Nycterimyia septempunctata* n. sp., holotype. Length of wing: 10.6 mm. Length of antenna: 1 mm.

and facial structures of a velvet brownish-black colour, the area around antennal bases greyish-brown dusted. Occiput covered by greyish-brown dust, dorsal margin shiny black. Antennae yellowish. The hairs on ocellar tubercle, frontal triangle, the two first antennal joints, and on face and occiput are long and golden-brownish.

T h o r a x. Mesonotum velvet brownish-black (darker than frons and face) and without any distinct stripes or other markings. Scutellum much paler than mesonotum, entirely greyish dusted. Pleura greyish-brown to brown. All thoracic hairs are long and golden-brownish.

W i n g s. As shown in fig. 1. The brownish coloration is strongest at base of the wing and in a streak over the central part of the

wing, ending partly at the wing-tip, partly along the distal part of the strong oblique vein. The fore margin and the hind margin have a paler brownish coloration, and two semi-hyaline areas are present along the hind margin. Alula dark brownish. Seven hyaline spots of nearly equal size are present as follows: base of axillary cell, center of second basal cell, bases of the two basal hind-marginal cells, center of discal cell, and two spots in second radial cell separated by a vein connecting r_{2+3} and r_{4+5}. Halteres yellowish.

Legs. All legs yellowish with yellowish hairs. Hind femora thickened in apical half.

Abdomen. Ground coloration brownish, first tergite with distinct greyish dust (as scutellum), the following tergites more blackish-brown. Small rectangular lowered spots are present laterally near fore margins of tergites 2—5. Sternites brownish, and slightly greyish dusted. Pubescence of abdomen sparse and depressed except for on fore parts of tergites 2 and 3 and on the lateral margins of the tergites. All hairs golden-brownish.

Length. Total: 9 mm. Wing: 10.6 mm.

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Nye danske biller (Coleoptera) 1966.

Af
Victor Hansen
I. E. Ohlsensgade 4, København Ø.

Siden tillægget for 1965 (Ent. Medd. 34: 264—268) til fortegnelsen over Danmarks biller i Ent. Medd., bind 33, 1964 er der konstateret 5 nye arter.

Helophorus walkeri Sharp. (Fortegn.: 64 efter l. 8 f. o.). Som anført i D. F. IX: 40 er *H. flavipes* F. (*viridicollis* Steph.) en stærkt varierende art. En form, *walkeri* Sharp, anses nu af D. K. Kevan, jfr. Ent. Monthly Mag. 1965: 259 og 261—262, for en særskilt art, navnlig støttet på, at hannens parringsorgan har meget længere basalstykke hos *flavipes* end hos *walkeri,* og at organet hos *flavipes* er gulbrunt, hos *walkeri* bleggult. Ved hjælp af dette kendetegn lader de 2 arters hanner (desværre er hannen hos *Helophorus*-arterne ikke kendelig ved sekundære kønskarakterer) sig med sikkerhed adskille. Typiske eksemplarer af de 2 arter (både ♂ og ♀) er iøvrigt kendelige ved, at pronotums inderste sidelængdefurer hos *flavipes* er jævnt og rundet, hos *walkeri* udpræget stumpvinklet, udadbøjede i midten (fig. 1), men denne karakter er under-

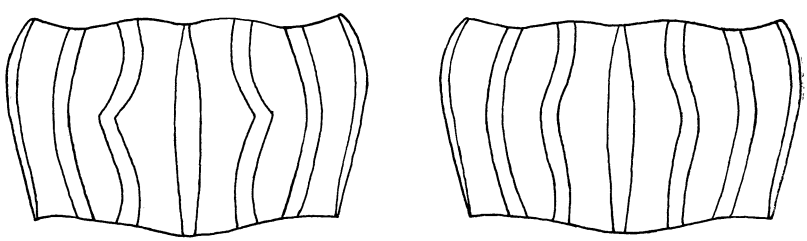

Fig. 1. Pronotum hos typiske eksemplarer af *Helophorus walkeri* og *flavipes.*

givet nogen variation. Som regel har *walkeri* noget lysere farvede vingedækker med lidt stærkere rundede sider og lidt mere but spids.

Danske eksemplarer af *walkeri* foreligger fra Amager fælled (19.8.1923, coll. V. H.). Den forekommer undertiden sammen med *flavipes*.

Conosoma testaceum F. og **marshami** Steph. (Fortegn.: 142, l. 20 f. o.). En undersøgelse af det danske materiale, der har været opført som *Conosoma testaceum* F., foretaget på grundlag af Andr. Strands artikel i Norsk Ent. T. XIII (1966): 408—411, viser, at det rummer 2 arter: en større art med brunrøde vingedækker, som er lysere end hoved og pronotum, og lange følehorn med længere end bredt 7. led og ikke tværbrede 8. og 9. led (*marshami* Steph.) og en gennemsnitligt lidt mindre art med vingedækker, som er brunsorte eller mørkebrune og ikke eller ikke væsentligt lysere end hoved og pronotum, og kortere følehorn med ca. så langt som bredt 7. led og tydeligt tværbrede 8. og 9. led (*testaceum* F.).

En tredje art, *strigosum* J. Sahlb. (*stöckli* Lokay), står *marshami* yderst nær og stemmer overens med denne i størrelse og følehornsbygning, men afviger fra den ved, at vingedækkerne er mørke, ikke lysere end hoved og pronotum, dette lidt mindre tæt punkteret og behåret og de udstående hår fortil på bagkroppens sider yderst fine og korte (hos *marshami* lidt kraftigere og lidt længere).

Efter delingen af *testaceum* i 2 arter bør i bestemmelsestabellen i D.F. XVI: 198 linie 5—8 f. o. erstattes af følgende:

5. 7. følehornsled længere end bredt, 8. og 9. led ikke, 10. led kun svagt tværbrede. Vingedækkerne brunrøde, lysere end hoved og pronotum. Længde 3,6—5 mm ..... 4. *marshami*.
—. 7. følehornsled ikke længere end bredt, 8.—10. led tydeligt tværbrede. Vingedækkerne brunsorte eller mørkebrune, som regel ikke lysere end hoved og pronotum. Længde 2,5—4,8 mm ..... 6.
6. Større, 3,5—4,8 mm. Følehornenes endeled noget længere end bredt ..... 4a. *testaceum*.
—. Mindre, 2,5—3,2 mm. Følehornenes endeled kun ganske lidt længere end bredt ..... 5. *immaculatum*.

C. marshami er almindelig (J.Ø.B.). *C. testaceum* synes hos os at være langt sjældnere. Eksemplarer foreligger fra Skørping, Lindum, Dyrehaven og Asserbo plantage. På alle disse lokaliteter er de to arter fundet sammen. *C. strigosum* er bl. a. fundet i Norge (et par gange i Sydnorge, men ellers kun i Nordnorge), og dens

forekomst hos os er ikke særlig sandsynlig. Den stemmer i levevis overens med de øvrige *Conosoma*-arter (D.F. XVI: 197). *C. strigosum* er i Norge bl. a. fundet talrigt engang i svampen Armillaria mellea (honningsvamp).

Thiasophila wockei G. W. Schneider (*nitescens* Fauv.) (Fortegn. 184 efter l. 12 f. o.) (Max Bernhauer i Verhdl. der k. k. zool.-bot. Ges. in Wien, Bd. LII (1902): 34 [120]; T.Munster i Norsk Ent. T. II (1930): 39). Opdaget hos os af overlærer Johs. Petersen, som i Asserbo plantage d. 22.—25. juli 1965 tog nogle eksemplarer ved sigtning fra en gammel, liggende birkestamme, der var beboet af myren *Camponotus herculeanus*. På samme lokalitet, som Johs. Petersen var så venlig at anvise mig, fandt jeg d. 31. maj 1966 3 eks. ved sigtning af et bo af samme myreart, anlagt i hulheden af en gammel, liggende granstamme. Arten, der er kendt som gæst hos den nævnte myreart, er fundet i Norge, Sverige (syd på til Hälsingland) og Finland samt i Sydfrankrig og de italienske Alper.

Arten kan indføjes i bestemmelsestabellen i D.F. XVII: 442 ved følgende tilføjelse i tabellens begyndelse:

1. Pronotum tydeligt over ½ gang bredere end langt, blankt, fint og ikke ret tæt kornetpunkteret. Følehornene rødgule, ret slanke, 5. led ikke eller kun ganske lidt bredere end langt .... 4. *wockei*.
—. Pronotum ikke over ca. ½ gang bredere end langt, i modsat fald (*inquilina*) er pronotum, lidet blankt, tæt og kraftigt kornetpunkteret, følehornene brunrøde med lysere rod og endeled og deres 5. led betydeligt bredere end langt ..... 1a.

Linie 2 f. o. ændres »1.« til: »1a«.

Arten er kendetegnet ved det store, brede, stærkt hvælvede, blanke pronotum. Kroppens farve omtrent som hos *angulata*, følehorn og ben rødgule. Følehornenes 6.—10. led ikke nær så stærkt tværbrede som hos *inquilina*. Længde 2,8—3,2 mm.

Cryptophagus postpositus J. Sahlb. (Fortegn.: 265, l. 3 f. o.; D. F. XIII: 207). Nogle eks. i svamp på et gammelt æbletræ i Rosenvænget, København, 9.9.1966 (J. Th. Skovgaard leg., V. H. det.).

Chaetocnema heikertingeri Ljubischtscheff (Fortegn.: 381, efter l. 17 f. n.; Ent. Bl. 1964: 113—116 (Folwaczny) og 1965: 170 (Horion); Gunnar Israelson i »Natur i Göinge« 1966: 28; Die Käfer Mitteleuropas, bind 9 (1966, K. H. Mohr): 255). Denne art, der er beskrevet fra Sibirien, har vist sig at være udbredt i Mellemeuropa indtil Østfrankrig og er nu også konstateret i Danmark,

først af lektor Gunnar Israelson (1 ♂ ketset i Als Sønderskov, 18.6.1966).

Arten er yderst nærstående til den almindelige *concinna Marsh.* (D.F. VII: 189), som den ligner til forveksling. Den afviger fra *concinna* ved, at følehornenes yderste halvdel som regel er brunsort, mørkere end hos *concinna,* hvis følehorn er mere jævnt og gradvis mørkere mod spidsen, men dette kendetegn synes at være varierende. Det bedste, af Israelson først påpegede, skelnemærke synes at være forskellen i formen af følehornenes endeled: hos

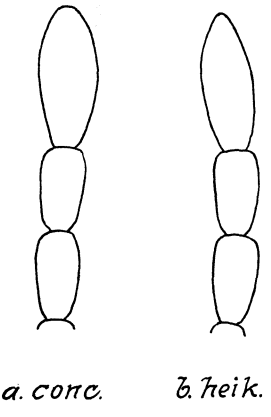

Fig. 2.

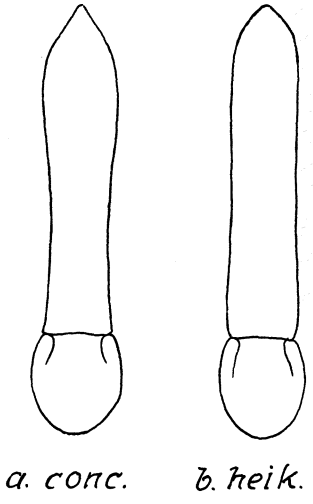

Fig. 3.

Fig. 2. Følehornsspidsen hos *Chaetocnema concinna* og *heikertingeri.*
Fig. 3. Penis set fra oven hos *Chaetocnema concinna* og *heikertingeri.*

heikertingeri er dette led ikke eller næppe bredere end 10. led og ret langt og stærkt tilspidset, medens det hos *concinna* er mere sammentrykt, set på den bredeste led tydeligt bredere end 10. led og kortere og mere but tilspidset (fig. 2). Hos hanner af *heikertingeri* er 1. forfodsled lidt stærkere udvidet end hos hannerne af *concinna,* og penis, set fra oven, parallelsidet, ved spidsen ikke eller næppe udvidet og ret kort tilspidset, medens penis hos *concinna* omtrent fra midten er tydeligt udvidet mod spidsen og denne som regel lidt længere tilspidset (fig. 3).

Arten er formodentlig udbredt hos os, men antagelig sjældnere end *concinna.* Eksemplarer foreligger fra Eisbøl, Rugballegård,

Saltø skov, Damhusmosen og Geelskov, marts, juni, sept. Ifølge Israelson forekommer den ofte sammen med *concinna,* og de to arter, der er fundet talrigst i juni og august, klækkes sikkert om eftersommeren med overvintring som imago. *Heikertingeri* er i Sverige fundet på meget forskelligartede lokaliteter, på åben markbund med rig vegetation, på sandbund (også i klitter) med sparsom vegetation, i løvskov og skovenge, i moser og kær og på sø- og havbredder. Måske lever den ligesom *concinna* især på Rumex og Polygonum; ved en enkelt lejlighed er begge arter banket i antal af Sisymbriun officinale og *heikertingeri* af Carduus.

Summary.

Five species of Coleoptera are recorded as new to the Danish fauna: *Helophorus walkeri* Sharp, *Conosoma marshami* Steph. (hitherto confounded with *C. testaceum* F.), *Thiasophila wockei* G. W. Schneider *(nitescens Fauv.), Cryptophagus postpositus* J. Sahlb. and *Chaetocnema heikertingeri* Ljubischtscheff (hitherto confounded with *Ch. concinna* Marsh.).

Entomologiske Meddelelser 35 (1967)

Hylotrupes (Col., Cerambycidae) in dead trees on Fårön, a Swedish island.

By
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Government Pest Infestation Laboratory, Denmark.

The Cerambycid pest of structural timber, the House Longhorn Beetle or Housebock, also called Old Houseborer, European Houseborer or Italian Beetle, *Hylotrupes bajulus* L. is distributed widely over the world though it is confined to the warmer temperate and the subtropical zones; for quotations see e. g. Dürr, 1954.

In the northern Europe Lekander 1955 describes the occurrence of *Hylotrupes* in Sweden as concentrated in a belt along the east coast, to about Uppsala in the north and around the south coast to the southernmost part of Halland on the west coast. In Finland Holm and Ekbom 1958 found *Hylotrupes* to occur only in some islands of the Åland archipelago, where it was very abundant, but to be absent from continental Finland. In Norway Knudsen 1966 describes the distribution as limited to a number of relatively small areas, namely along the east coast of the Oslo fjord and around the middle parts of some of the bigger fjords on the southern west coast. The distribution in Denmark has not been published, but a great number of records in the Government Pest Infestation Laboratory show that *Hylotrupes* is most frequent in the south-eastern part of the country and that the frequency decreases towards the west, so *Hylotrupes* scarcely occurs in a great part of southern West Jutland. In the British Isles *Hylotrupes* is limited to a number of isolated attacks in widely separated areas of England and Wales and an area in Surrey with a denser infestation (White 1959).

All these records are based on its occurrence as a pest in structural timber, and though it is often found in unheated premises and even in timbers out-of-doors, the occurrence in natural dead trees is very scarce and most probably never original. This rather

paradoxical state of affairs might be due to the fact that the original habitat has vanished with the mediterranean primeval forests which were destroyed by felling and sheep-grazing in ancient times. Only the simultaneous presence of a replacing biotope, timbers in houses, saved the species from extinction. The new biotope suited *Hylotrupes bajulus* so excellently that it has spread with applied wood to live in houses in a great part of the world.

In Northern Europe the occurrence of *Hylotrupes* in dead trees is known only in the two small Swedish islands in the Baltic, Fårön immediately north of Gotland, and Gotska Sandön a little further north.

Fårön takes its name from the traditional breeding of sheep, which go in the the open even during the winter. The intense sheep grazing marks the landscape e. g. by the dominance of the poisonous plant *Cynanchum vincetoxicum* L. which is not eaten by the sheep. On Fårön a favorite habitat to *Hylotrupes* is the widespread paling fences, but it is very common in all structural and other converted pine wood just as it is in Gotland and the nearby part of continental Sweden due to the typical warm dry summer climate which is very favourable to this insect. In Fårön an extreme example of this type of climate is combined with a very hard chalky soil, and this combination gives strange conditions for the growth of the pine trees *(Pinus sylvestris)* because their roots must lie very superficially, often even in the open, so they are not in constant contact with the subsoil water. For that reason local populations of pine trees are frequently killed by occasional drought or turned over by strong winds. Hence there is constantly a high density of those insect species which deal with newly killed pine trees, and having built up in an area with dead trees they might attack and kill remaining living trees. This fauna includes such species as the bark beetle *Blastophagus minor* Hartig, which introduces blue-staining fungi and soon loosens the bark. Subsequently the trees dry out quickly, and cracks appear, forming the oviposition sites for *Hylotrupes* which is unable to lay eggs in trees with bark. Not having the roots in contact with the subsoil water the tree might remain standing debarked and dry for several years allowing *Hylotrupes* to complete more of its life cycles before the tree turns over, eventually as the result of the tunnelling of the Cerambycid *Criocephalus rusticus* L. in the lower part of the stem. The lying trees are soaked with water through

the cracks and during the snow melting period, so they soon become wet and cool and are unfavourable to *Hylotrupes*. In such lying decayed trees we found the larvae of the big Cerambycid *Ergates faber* L.

In some of the dead standing trees we found a few *Hylotrupes* beetles sitting in the cracks and a large number of larvae of *Hylotrupes* distributed in the sap wood. They were not concentrated in the outer layer near the cambium as is usually the case when they live in houses, and we found a number of big dead larvae near the surface. This is in accord with Dominik's findings (1966) that *Hylotrupes* larvae cannot survive the very fluctuating temperatures near the surface of the wood in the open during wintertime, because they will not be able to remain in the quiescent state which is necessary for their ability to overwinter. We found *Hylotrupes* also in a dead limb on a living tree.

In the trees where we found the *Hylotrupes* larvae there were also extinct attacks of *Blastophagus minor* and the wood was always more or less blue-stained. In the upper parts of the trees there were usually flight holes of wood wasps, *Sirex* sp., and deserted pupal chambers of the weevil *Hylobius abietis* L, and the Cerambycid *Acanthocinus œdilis* L.

Living together with the *Hylotrupes* larvae in the wood we found larvae of *Leptura sanguinolenta* L. (Cerambycidae) and small black weevils of the species *Eremotes ater* L. In four instances we found an eaten larva or pupa in its chamber together with 3—4 larvae or beetles of *Bothrideres contractus* Fab, which was thus found to prey upon *Hylotrupes bajulus*. Two deserted *Hylotrupes* pupal chambers were filled with about 50 black aphides, and in one of them was a long slender insect egg and in the other one a dead digger wasp, *Pemphredon lugens* Dahlb. which is known to prey on aphides and to make nests in holes in wood.

Although *Hylotrupes* was found in dead trees more than 1 km from houses to my opinion the occurrence on Fårön does not seem to be natural in the sense that they live without human support. Everywhere on the island they occur mainly in structural timber and even in the forest they seem to spread from the wooden fences, which are seen everywhere. However, this question will be further studied by the Nordic-English *Hylotrupes* group who arranged also this excursion.

Acknowledgments.

The author wishes to thank the Nordic College of Terrestrial Ecology who paid the excursion, and the colleagues in the Nordic-English *Hylotrupes* group who took part in the excursion and have participated with discussion and advice. They are Karl-Johan Hedquist, Stockholm, who arranged the trip, Pehr Ekbom, Finland, and Michael Baker, England; further Victor Butowitsch, Stockholm, and Per Knudsen, Oslo who did not take part in the excursion. I also wish to thank Mr. Curt Thornberg, Stockholm who helped the group during the excursion.

Summary.

In northern Europe the wide-spread pest of structural timbers, *Hylotrupes bajulus,* is patchy distributed and in naturally occurring dead trees it is only found in two Swedish islands in the Baltic, Gotska Sandön and Fårön. In Fårön they were found in a dead limb on a living tree and in characteristic long-standing dry trees together with some other insect species, of which *Bothrideres contractus* (Col.) preyed upon Hylotrupes. It is provisionally concluded that on Fårön Hylotrupes exists only in the nature because it is supported by the heavy infestation in structural timbers, e.g. wooden fences.

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Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 49).

Dermaptera collected by the Noona Dan Expedition in the Philippine and Bismarck Islands.

By
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This paper is a report on the Dermaptera collected by the Danish "Noona Dan" Expedition 1961—62 to the southern parts of the Philippine Islands and to various islands of the Bismarck Archipelago (see Petersen 1966 for details, maps etc.). The collection was placed at the disposal of the author through the kindness of Dr. Børge Petersen of the Zoological Museum, Copenhagen.

The collection contains a total of 303 specimens of which only 61 are from the Philippines. The remainder, 242 specimens, is from the Bismarck Islands including a few specimens from Guadalcanal in the Solomon Islands. About thirty nymphs are undetermined as well as a few females which could not be determined without the male sex.

Our knowledge of the Philippine Dermaptera is to a large extent based on the works of Borelli (1915, 1916, 1923 and 1926) and no significant information is available before these four studies. The Philippine collection consists of 19 species (in 16 genera). Three of these species are considered new to science.

The Dermaptera of the Bismarck Archipelago has remained neglected though reports on the earwigs of the surrounding Melanesian Islands and New Guinea are not scarce in literature. *Echinosoma yorkense* Dohrn (Burr 1907) and *Apachyus beccari* Dubrony (Brindle 1966) are previously known from New Britain. Prof. G. J. Bey-Bienko of the Academy of Sciences, U.S.S.R., was kind enough to inform the author about records from these islands of *Tagalina semperi semperi* Dohrn, *Anisolabis verhoeffi* Zacher, *Marawa wallacei* Dohrn, *Marawa subaptera* (Kirby) (both

these species are now considered synonymous with *Marawa arachidis* (Yersin)) and *Chelisoches morio* (Fabr.). He cites Zacher (1911), Burr (1912) and Günther (1933) as the sources of these records. Hincks (1938) has no additions to these in his check-list of the Dermaptera of Oceania. Rehn (1948) refers to the presence of *Tagalina grandiventris* (Blanchard) in New Ireland, but Hincks (1955) limits the distribution of this species to New Guinea.

Our knowledge of the Dermaptera of the Bismarck Islands is thus very limited and the present study is therefore of interest. The examination of the Noona Dan collection shows the presence of 29 species (in 22 genera) of which 2 genera and 11 species are considered new to science. A significant feature of the collection is that nearly all of the species are represented by the male sex which helped in the determination to specific rank. This is particularly true of uniques which otherwise would have remained unknown. The great diversity in the taxa of this small collection suggests the existence of more species in the islands.

The general composition of the material is indicative of a strong Indo-Malayan influence on the fauna, and the presence of *Brachylabis* Dohrn and *Euenkrates* Rehn in this region adds to our knowledge of the discontinuous distribution of these genera.

The two genera described below, *Physogaster* gen. nov. and *Parapericomus* gen. nov., present interesting affinities. They belong to the family Labiidae and are characterised by a keel on the costal fold of the elytra. With this character four genera are known in this family, but only one of these (*Nesogaster* Verhoeff) is known from the present geographical region. Of the other three, two (*Pericomus* Burr and *Strongylopsalis* Burr) are Neotropical while the third (*Vandex* Burr) is restricted to Central Africa. The general build together with the nature of the antenna and the male genitalia prevents the inclusion of *Physogaster* and *Parapericomus* in any of these subfamilies, though they bear a superficial resemblance to *Pericomus* in the pubescence of the body, sculpturing of the pronotum and the organs of flight. In view of their size, which is rather large for the family, a new subfamily, Physogastrinae nov., is proposed for these genera.

Before giving the List of Species — arranged according to the modified classification of the order outlined by Popham (1965) — a key to the genera of the earwigs of the Bismarck Islands is presented as an aid to future students.

Generic Key to the Dermaptera of the Bismarck Islands.

1 (16) Male genitalia with paired distal lobes

2 (5) Both distal lobes reflected downwards

3 (4) Large insects measuring more than 30 mm.; second tarsal segment short and broad, forming a ring around base of third ..... *Tagalina* Blanchard.

4 (3) Small insects hardly exceeding 10 mm.; second tarsal normal ..... *Echinosoma* Serville.

5 (2) One of the distal lobes projected up

6 (9) Pygidium fused with ultimate tergite and drawn into an anal process

7 (8) Anal process very large, occupying more than three-fourths the area enclosed by forceps; pronotum elliptical ..... *Apachyus* Serville.

8 (7) Anal process broad, indistinct, very little produced beyond base of forceps; pronotum rectangular .. *Dendroiketes* Burr.

9 (6) Pygidium free from ultimate tergite, narrow and of different kinds

10 (15) Totally apterous; tergites 6—9 of abdomen of male blunt laterad; antennal segments not clavate

11 (12) Mesonotum keeled; ultimate tergite with two distinct tubercles above base of forceps, the region in between deeply sinuate ..... *Brachylabis* Dohrn.

12 (11) Mesonotum not keeled; ultimate tergite truncate caudad

13 (14) Metasternum rounded and forming a lobe between legs ..... *Anisolabis* Burr.

14 (13) Metasternum almost truncate, not produced beyond legs ..... *Parisolabis* Verhoeff.

15 (10) Elytra at least well developed, tergites 6—9 of abdomen of male acute and carinate laterad; antennal segments clavate ..... *Epilandex* Hebard.

16 (1) Male genitalia with single distal lobe

17 (34) Second tarsal segment distinct, not produced below third

18 (23) Elytra with a distinct keel on costal fold

19 (20) Small insects with slender forceps; abdomen smooth, antennal segments clavate ..... *Nesogaster* Verhoeff.

20 (19) Large insects with body covered by dense hairs; antennal joints subconical or subcylindrical; femora incrassate, tibiae sulcate in apical half

21 (22) Elytra and wing scales distinctly rugose, antennal segments slender and subcylindrical; parameres broad and short ..... *Parapericomus* gen. nov.

22 (21) Elytra and wing scales not rugose, antennal segments sub-

conical; parameres very long and narrow
..... *Physogaster* gen. nov.

23 (18) Costal fold of elytra without a keel

24 (25) Head strongly depressed; pronotum drawn into a neck anteriorly ..... *Auchenomus* Karsch.

25 (24) Head tumid; pronotum not drawn into a neck anteriorly

26 (29) Eyes as long as or longer than first antennal segment; sutures of head obsolete

27 (28) Antennal segments pyriform ..... *Marava* Burr.

28 (27) Antennal segments subcylindrical ..... *Spongovostox* Burr.

29 (26) Eyes shorter than first antennal segment; sutures of head distinct

30 (33) Antennal segments cylindrical, 4th and 5th as long as or longer than third

31 (32) Pronotum rectangular, not narrowed anteriorly . *Labia* Leach.

32 (31) Pronotum longer than broad, narrowed anteriorly
..... *Chaetospania* Karsch.

33 (30) Antennal segments conical, 4th and 5th shorter than 3rd
..... *Prolabia* Burr.

34 (17) Second tarsal segment drawn into a lobe below or forming wing-like expansions on either side of base of third

35 (44) Second tarsal produced into a lobe below third

36 (37) Tibiae not flattened and sulcate in distal half, tarsi long and slender ..... *Adiathetus* Burr.

37 (36) Tibiae flattened and sulcate in distal half, tarsi short and broad

38 (39) Small black insects with a dense coating of uniformly short hairs ..... *Hamaxas* Burr.

39 (38) Large insects with a smooth body or with a few long bristles

40 (41) Head depressed, antennal segments very long and slender; colour with a shade of brown ..... *Proreus* Burr.

41 (40) Head tumid, antennal joints short and thick

42 (43) Pitch black insects; head sutures sunken between inflated areas of frons and occiput; male forceps with heavy armature
..... *Chelisoches* Scudder

43 (42) Reddish brown insects with a slender build; sutures of head obsolete; forceps slender and almost smooth
..... *Euenkrates* Rehn

44 (35) Second tarsal segment forming wing-like expansion on either side of base of third

45 (46) Pronotum large, as broad as long, cephalic angles smooth
..... *Kosmetor* Burr.

46 (45) Pronotum narrow, longer than broad, cephalic angles each with a distinct tubercle or spine .... *Acanthocordax* Günther.

List of Species.

Superfamily **PYGIDICRANOIDAE.**

Family **PYGIDICRANIDAE.**

Subfamily PYGIDICRANINAE.

Tagalina grandiventris (Blanchard).

Forficula grandiventris Blanchard, 1853, Voy. Pole Sud 4:349, Orth. pl. 1, f. 1 (♀ Solomon Islands).

Tagalina semperi, Burr (nec Dohrn), 1912, Ann. Naturf. Hofmus. Wien, 26:27 (partim, Solomon Islands).

Tagalina semperi semperi Dohrn, Rehn, 1948, Trans. Amer. ent. Soc., 74:159 (Solomon Islands).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 2 ♂, 1 ♀, 10 May, 1 ♀, 19 May 1962. — NEW IRELAND: Lemkamin, 900 m, 2 nymphs, 17 April 1962. — DYAUL: Sumuna, 2 ♂, 1 ♀, 3 nymphs, 11 March 1962. — MUSSAU: Talumalaus, 1 nymph, 22 Jan. 1962; Boliu, 1 ♀, 5 June 1962.

Subfamily ECHINOSOMATINAE.

Echinosoma yorkense Dohrn.

Echinosoma yorkense Dohrn, 1869, Stettin. ent. Ztg., 30:234 (♀ Australia, Cape York).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, in rotten wood, 6 ♂, 10 ♀, 19 nymphs, 10—21 May 1962. — NEW IRELAND: Kalili Bay, Danu, 1 nymph, 30 April 1962.

Echinosoma sp.

Echinosoma yorkense Dohrn, 1869, Stettin. ent. Ztg. 30:234 (♀ Au- nymphs, 15 Aug. — 8 Sept. 1961.

Family **DIPLATYIDAE.**

Subfamily DIPLATYINAE.

Diplatys sublobatus Borelli.

Diplatys sublobatus Borelli, 1923, Boll. Mus. Zool. comp. Torino, 38 (N.S.) nr. 13: 3.

Philippines. — TAWI TAWI: Tarawakan, 1 ♀, 9 Nov. 1961.

Diplatys sp.

Philippines. — BALABAC: Dalawan Bay, 1 ♀, 9 Oct. 1961.

The only other species of *Diplatys* known from the Philippines is *D. mixtus* Borelli, of which the female is unknown. It is not possible to determine the present female in the absence of the other sex.

Superfamily **LABIOIDEA.**

Family **CARCINOPHORIDAE.**

Subfamily PARISOLABINAE.

Parisolabis sp.

Bismarck Islands. — NEW IRELAND: Lemkamin, 900 m, 1 ♀, 16 April 1962.

The genus *Parisolabis* has four species included and is known from N. India, Java and New Zealand (Popham & Brindle 1966). In the absence of the male sex it is not possible to determine the present female.

Subfamily BRACHYLABINAE.

Brachylabis yaloma spec. nov. (Figs. 1—5).

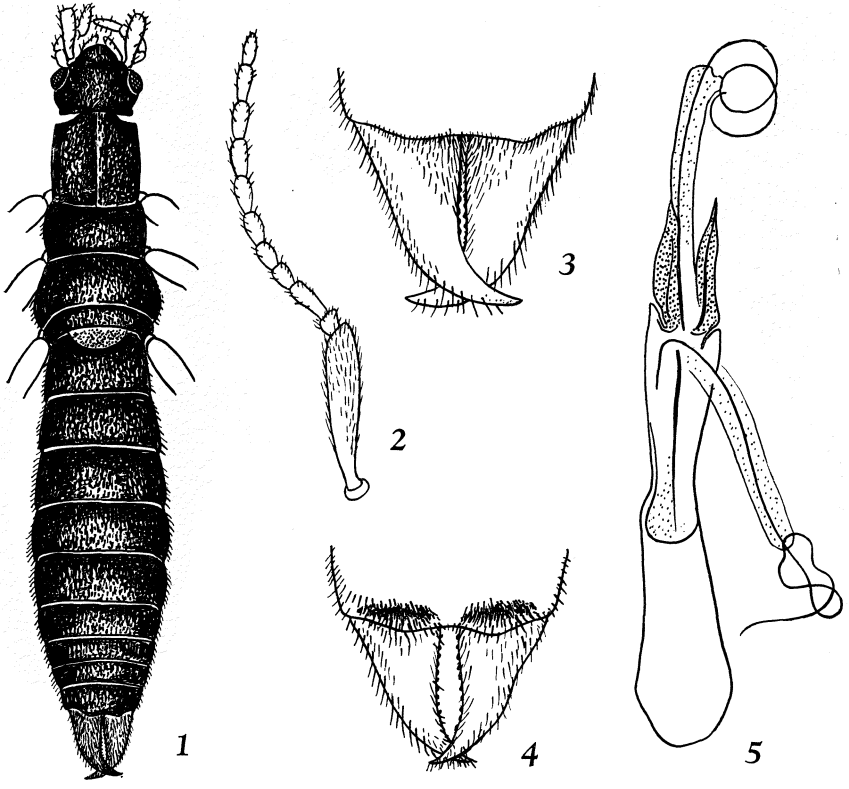
Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂ (Holotype), 1 ♀ (Allotype), 17 May 1962. In the Zoological Museum, Copenhagen.

Male: General colour dark brown except terminal antennal segment pale; whole body including head punctulate and microsetulose.

Head, tumid, short, broadest across eyes, occipital margin subsinuate; eyes very small, about half the length of genae. Antenna, 11 segments, 1st large and conical, obliquely truncate apically, 2nd very small, 3rd long and slender, conical, 4th about one third the length of third, thick, rest a trifle longer than 4th, subcylindrical and thick. Pronotum, rectangular, longer than broad, slightly expanded caudad, anterior margin convex, caudal margin rounded, sides truncate. Abdomen, cylindrical, broadest across tergites 5 and 6, contracted beyond. Ultimate tergite, normal for the genus. Forceps, very short, beak-like, inner margin crenulate. Penultimate sternite, rectangular, caudal margin rounded, emarginate. Male genitalia, Fig. 5.

Body length 8.5 mm., length of forceps 0.95 mm.

Female: Agrees with male in general; parallel sided except for



Figs. 1—5. *Brachylabis yaloma* spec. nov. (1) Holotype male, dorsal view. (2) Antenna of male. (3) Forceps of female. (4) Forceps of male. (5) Male genitalia.

ultimate tergite slightly contracted; forceps, of the same nature as in male but more robust.

Body length 7 mm., length of forceps 1 mm.

The genus *Brachylabis* Dohrn as known at present (Popham and Brindle 1966a) includes five species of which *B. canaca* Burr and *B. manawatawhi* Giles are known from the present geographical region, the former from New Caledonia and the latter from New Zealand. The present species is quite distinct from *manawatawhi* and differs from *canaca* in the much longer virga.

Subfamily CARCINOPHORINAE.

Euborellia plebeja (Dohrn).

Psalis plebeja Dohrn 1863, Stettin. ent. Ztg. 24:322.

Euborellia plebeja (Dohrn), Hebard, 1927, Proc. Acad. nat. Sci. Philad. 79:27.

Philippines. — TAWI TAWI: Tarawakan, 2 ♀, 20 and 25 Oct., 1 ♂, 16 Nov. 1961.

This species is known for the great variation in the development of the organs of flight. These three specimens are all macropterous.

Genus **Epilandex** Hebard.

Epilandex Hebard, 1927, Proc. Acad. nat. Sci. Philad., 79:26 (type *Landex burri* Borelli).

Landex Burr, 1915, J. R. micr. Soc. 445 (pars).

Landex burri Borelli, 1921, Bull. Mus. Hist. Nat. Paris, 79.

Besides the type of the genus two species are recorded, viz. *E. handschini* Hincks, 1954, Verh. Naturf. Ges. Basel, 65, 1:12—14, and *E. undulata* Ramamurthi, 1963, Ann. Mag. nat. Hist., 13 (6): 672—3. The new species described below is nearer to *E. handschini* Hincks. I have the pleasure in naming it after Dr. Børge Petersen.

Key to Species of *Epilandex.*

1 (4) Penultimate sternite of male with a distinct carina in the caudal half, produced into a process; metaparameres short, broad at base, narrowed apically.

2 (3) Forceps of male with a distinct cleft basad on inner margin; tip of parameres pointed and curved. ..... *E. undulata* Ramamurthi.

3 (2) Inner margin of forceps of male entire basad; apex of parameres blunt ..... *E. burri* Borelli.

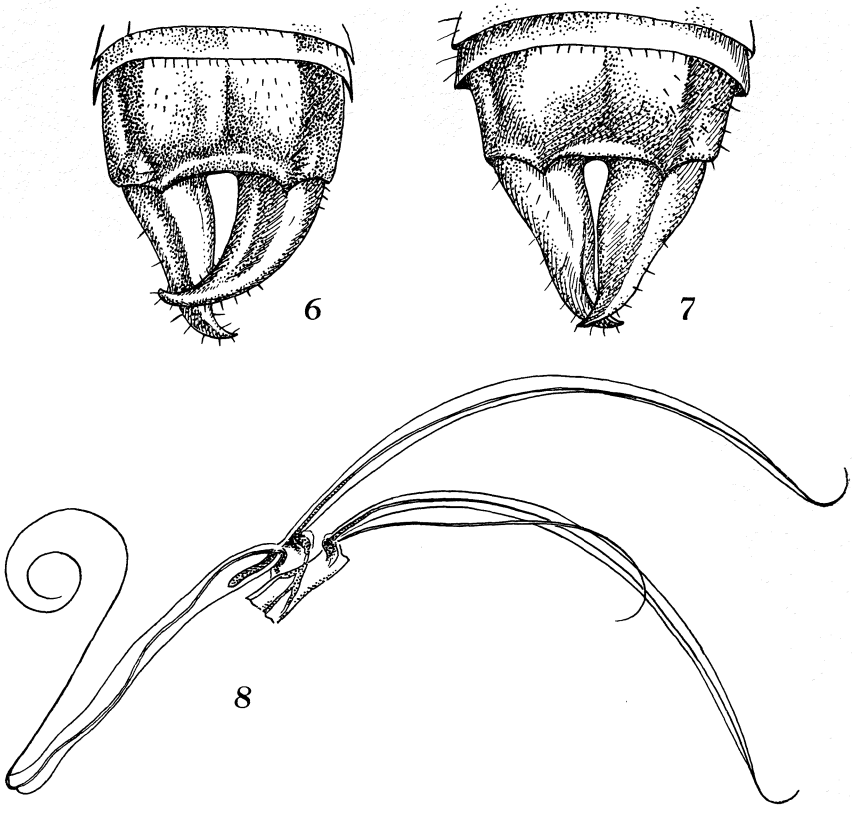
4 (1) Carina of penultimate sternite weak, not produced into a process; metaparameres very long, uniformly narrow, pointed apically.

5 (6) Inner margin of forceps of male concave basad, with a distinct hump at middle, gently curved beyond; smooth ..... *E. handschini* Hincks.

6 (5) Inner margin of male forceps entire, left branch abruptly narrowed near apex and with or without a sub-apical tooth ..... *E. peterseni* spec. nov.

Epilandex peterseni spec. nov. (Figs. 6—8).

Philippines. — TAWI TAWI: Tarawakan, 1 ♂ (Holotype), 22 Oct. 1961. — PALAWAN: Pinigisan, 600 m, 1 ♂, 2 ♀ (Paratypes), 10 and 20 Sept. 1961, 1 ♀ (Allotype), 24 Sept. 1961; Tagembung, 1150 m, 1 ♂ (Paratype), 19 Sept. 1961.



Figs. 6—8. *Epilandex peterseni* spec. nov. (6) Ultimate tergite and forceps of male. (7) Ultimate tergite and forceps of female. (8) Male genitalia (broken).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 3 ♀ (Paratypes), 16 and 20 May 1962. — NEW IRELAND: Lemkamin, 900 m, 1 ♀ (Paratype), 7 April 1962.

Types in the Zoological Museum of Copenhagen except for two paratypes in my collection.

Male: colour, Head black, rest of the body brownish, legs paler. Head, transverse, smooth, tumid, sutures indistinct. Antenna, 17 segments, clavate, 12—17 whitish and more narrowly elongated basally than the rest. Pronotum, narrower than head anteriorly, slightly expanded caudad, sides truncate, posterior margin rounded; tumid except for very narrow depressed areas laterad. Elytra, less than one and a half times longer than pronotum. Wings, well

developed. Abdomen, expanded caudad, tergites pubescent, 6—9 acute and carinate laterad. Ultimate tergite, broader than long, comparatively smooth, weakly punctate; disc with a distinct median sulcus and a shallow caudal depression; posterior margin truncate mesad, obliquely sinuate laterad. Forceps, asymmetrical, inner margin entire; left branch abruptly narrowed at apex, right branch gently arcuate. Penultimate sternite, broadly rounded, carina of caudal half very weak.

Genitalia, Fig. 8.

Length of body 6—8 mm.; of forceps 1.5—2 mm.

Female: Agrees with male in general. Abdominal tergites 6—9 blunt at sides; forceps symmetrical.

Length of body 8 mm.; of forceps 1.5 mm.

Family **LABIIDAE.**

Subfamily NESOGASTRINAE.

Nesogaster aculeatus (Bormans).

Labia aculeata Bormans 1900, Annals Mus. Civ. Stor. Nat. Genova, ser. 2, 20:456 (Papua).

Nesogaster atropas Rehn, Hincks 1951, Ann. Mag. nat. Hist. 12 (iv): 565 (new synonymy).

Bismarck Islands. — DUKE OF YORK: Manuan, 1 ♂, 1 nymph, 19 July 1962.

Nesogaster aculeatus var. **apoensis** Rehn.

Nesogaster apoensis Rehn 1946, Acad. nat. sci. Philad. 48:235 (Mindanao, Philippines).

Nesogaster aculeatus subsp. *apoensis* Rehn, Hincks 1951, Ann. Mag. nat. Hist. 12 (iv): 567.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂, 1 ♀, 8 and 9 May 1962. — NEW IRELAND: Lemkamin, 900 m, 2 ♀, 1 nymph, 20 April 1962.

The Philippine material studied by Rehn are characterised by absence of wings and penultimate segment of antenna paler. In the present series, the females from Lemkamin have no wings but the antenna has no paler article at apex. The pair from Yalom have fully developed wings and the subapical article of antenna is pale.

Nesogaster apicalis Hincks.

Nesogaster apicalis Hincks 1951, Ann. Mag. nat. Hist. 12 (iv): 568—570, f. 10, 11 (♂ ♀ New Hebrides).

Bismarck Islands. — NEW BRITAIN: Valoka, 1 ♂, 12 July 1962, rain forest.

Nesogaster amoenus (Stål).

Forficula amoenus Stål, 1885, Öfvers. Kungl. Vet-Akad. Förhandl., 12:350.

Philippines. — TAWI TAWI: Tarawakan, 1 ♀, 11 Oct. 1961.

Three species of this Indo-Pacific genus have been known from the Philippines so far, viz. *N. aculeatus* var. *apoensis* Rehn, *N. mounseyi* Burr and *N. burri* Rehn. The present female differs from these species in the nature of the pronotum and the well developed wings, agreeing more closely with females of *N. amoenus* reported in its macropterous form from Australia (Hebard 1933).

Subfamily PHYSOGASTRINAE nov.

Characters: Large insects with the whole body covered by long and stiff hairs; sutures of head obsolete, eyes shorter than first antennal segment; elytra with a distinct keel running the entire length of costal fold; femora incrassate, tibiae flattened and sulcate in apical half.

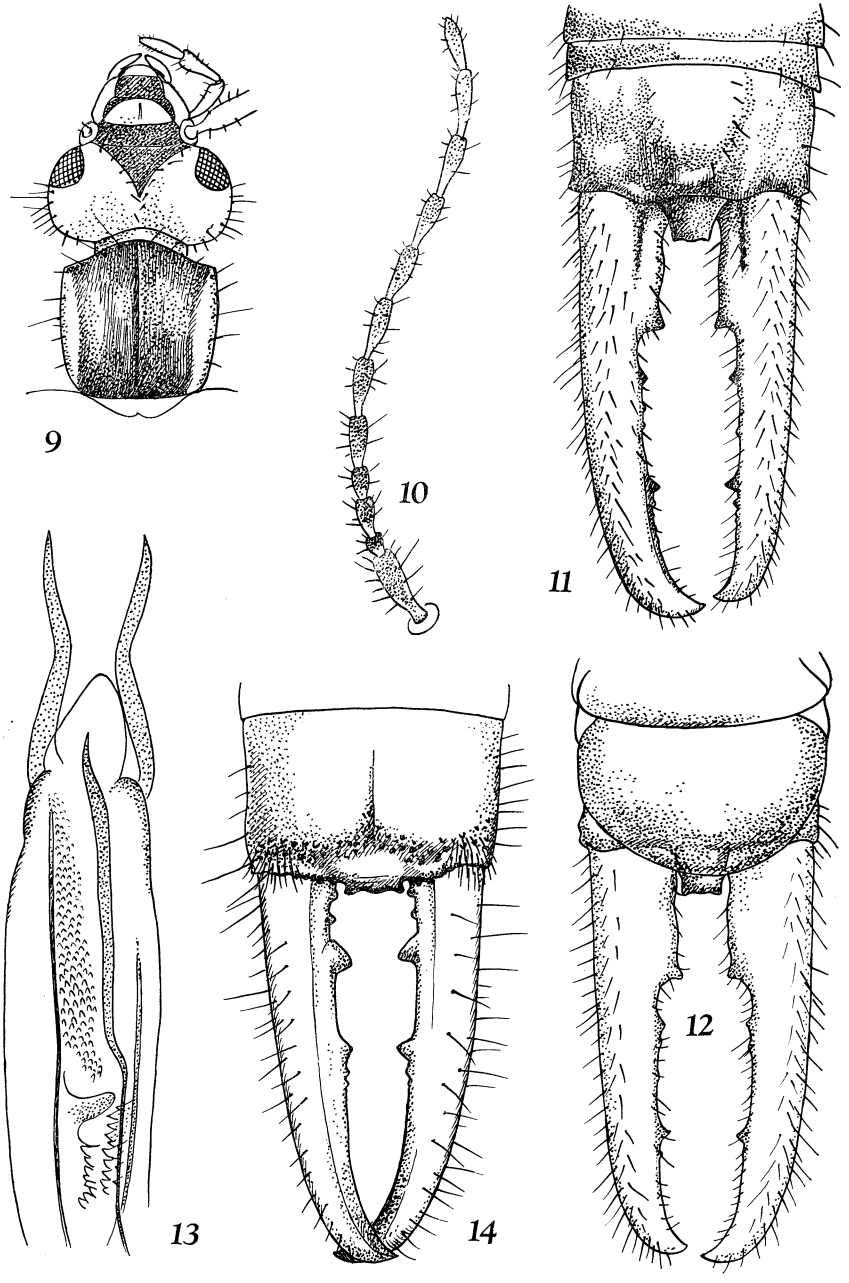
The genera for which the above subfamily is erected include earwigs which do not fit into any genus in the family Labiidae. In the sturdy build, incrassate femora and flattened and sulcate tibiae they resemble some forms of the family Chelisochidae. They can be distinguished from that family by the comparatively large second tarsal segment not produced into a lobe under base of third.

Physogaster gen. nov.

Characters: Body moderately depressed; antennal joints 3 and 5 subequal and cylindrical, 4th half as long as 5th and swollen at apex, rest subconical; metasternal lobe broad and flat, caudal margin deeply sinuate mesad.

Physogaster scabinatus gen. et spec. nov. (Figs. 9—13).

Bismarck Islands. — NEW IRELAND: Lemkamin, 900 m, 1 ♂ (Holotype), 15 April 1962, under bark of fallen tree, 4 nymphs, 15—20 April 1962. — NEW BRITAIN: Yalom, 1000 m, 3 nymphs,



Figs. 9—13. *Physogaster scabinatus* gen. et spec. nov., Holotype male. — (9) Head and pronotum. (10) antenna. (11) Ultimate tergite and forceps. (12) Penultimate sternite. (13) Genitalia. — Fig. 14. *Physogaster* sp.? Female, ultimate tergite and forceps.

8—23 May 1962. — MUSSAU: Talumalaus, 1 ♂ (Paratype), 19. Jan. 1962. In the Zoological Museum, Copenhagen, except a paratype in my collection.

Male: General colour dark brown, apices of femora and tibiae and tarsi light yellow, forceps orange, apical antennal joints whitish. Thoracic sternites smooth, whole of abdomen pubescent.

Head, transverse, distinctly tumid, sutures obsolete, cheeks broadly rounded, genae smooth, caudal margin deeply sinuate; antenna 12 segments, 3 and 5 subequal, cylindrical, 4 half as long as 5, rest elongate, slender, subconical. Pronotum, almost a square, cephalic margin convex, sides and posterior margin truncate, cephalic angles sharp, caudal angles rounded. Elytra, nearly twice longer than pronotum, costal fold keeled, surface covered by well spaced short hairs and a few scattered longer ones; cephalic margin oblique exposing a broadly triangular scutellum. Wing scales, same texture as and concolourous with elytra. Abdomen, moderately depressed, expanded caudad, surface of tergites with dense microsetae and a row of long hairs along posterior border; glandular folds on segments 3 and 4 well developed. Ultimate tergite, transverse, smooth, disc not separated from sides, median sulcus moderately distinct; disc with two distinct tubercles basad, the region below and between the forceps sunken; region above base of forceps denticulate; posterior margin trisinuate. Pygidium, vertical looked from above, flat, broad at base, contracted caudad. Forceps, depressed, broad at base, tapering to apex, tip incurved; a prominent ridge laterad at the point of insertion, lower inner margin with a distinct tooth one third the distance from base, crenulate beyond, another prominent tooth a short distance from apex. Penultimate sternite, almost a square, broadly rounded caudad, sinuate mesad.

Male genitalia, Fig. 13.

Body length 13 mm., length of forceps 4.5 mm.

Physogaster sp. ? (Fig. 14).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♀, 21 May 1962. — NEW IRELAND: Lemkamin, 900 m, 1 ♀, 12 April 1962.

These two females differ from *P. scabinatus* in the pitch black colouration and the punctulate body. The antennal segments are more slender and cylindrical with the fourth almost as long as

third and cylindrical. The metasternal lobe resembles that of *P. scabinatus*. The discovery of the male alone can confirm the status of this species.

Body length 11—13 mm., length of forceps 3—4 mm.

Parapericomus gen. nov.

Characters: Head, pronotum, elytra and wing scales rugose and punctulate; sutures of head obsolete; abdominal tergites 4 and 5 with a row of distinct tubercles associated with long sensory hairs; metasternal lobe narrow and rounded, caudal margin entire.

Parapericomus noonadanae gen. et spec. nov. (Figs. 15—18).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂ (Holotype), 20 May 1962, 1 ♀ (Allotype), 23 May 1962. Types in the Zoological Museum, Copenhagen.

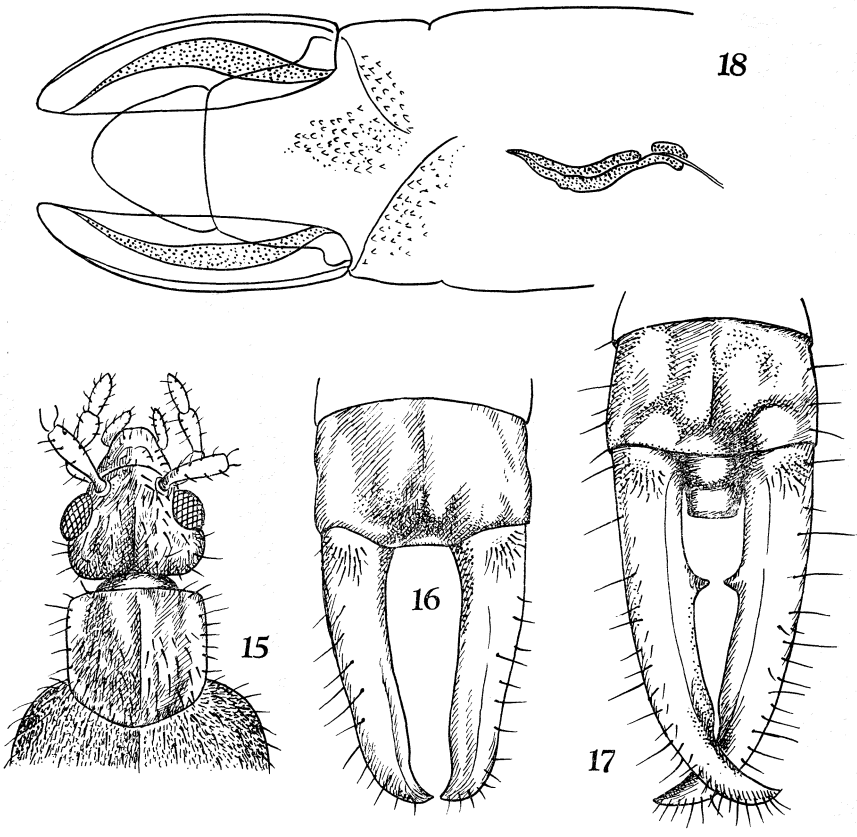
Male: General colour reddish brown mixed with yellow, distal half of femora and tibiae clear yellow; surface of body with a greasy lustre.

Head, tumid with coronal suture moderately visible, caudal margin sinuate; eyes large, as long as genae; antenna broken, 1st long uniformly thick, 2nd small, 3rd longer, rest a little longer than 3rd, all subconical. Pronotum, narrower than head, shield-shaped, prozona tumid, sulcus distinct. Elytra, nearly twice longer than pronotum, caudal margin obliquely truncate. Wing scales, nearly half elytral length. Abdomen, convex beyond 5th segment, expanded caudad, tergum of 4th and 5th segments with a row of denticles on caudal margin, rest of tergites except last weakly punctulate. Ultimate tergite, smooth, disc feebly separated from sides. sulcus weak, region above base of forceps tumid leaving a narrow rectangular area in between; caudal margin weakly sinuate, raised above base of forceps. Pygidium, short and transverse, concealed in dorsal view. Forceps, triquetrous, with a distinct keel basad, inner margin smooth, sinuate basad, scooped into a spoon near apex, outer margin with long sensory bristles. Penultimate sternite, broadly rounded. Male genitalia, Fig. 18.

Body length 10 mm., length of forceps 3 mm.

Female: Agrees with male in general. Pygidium more prominent, declivent. Forceps, with a distinct tooth on inner margin less than half the distance from base.

Body length 12.5 mm., length of forceps 5 mm.



Figs. 15—18. *Parapericomus noonadanae* gen. et spec. nov. (15) Allotype female, head and pronotum. (16) Holotype male, ultimate tergite and forceps. (17) Allotype female, ultimate tergite and forceps. (18) Holotype male, genitalia.

Subfamily SPONGIPHORINAE.

Spongovostox semiflavus (Bormans).

Spongophora semi-flava de Bormans, 1894, Ann. Mus. Stor. nat. Genova, (2) 14:385 (Burma).

Apovostox semiflavus (de Borm.), Hebard, 1927, Proc. Acad. nat. Sci. Philad. 79:32.

Spongovostox semiflavus (de Borm.), Borelli, 1932, Bull. Raffles Mus., 7:83.

Apovostox semiflavus (de Borm.), Bey-Bienko, 1958, Rev. Ent. U.R.S.S., 38, 3:611.

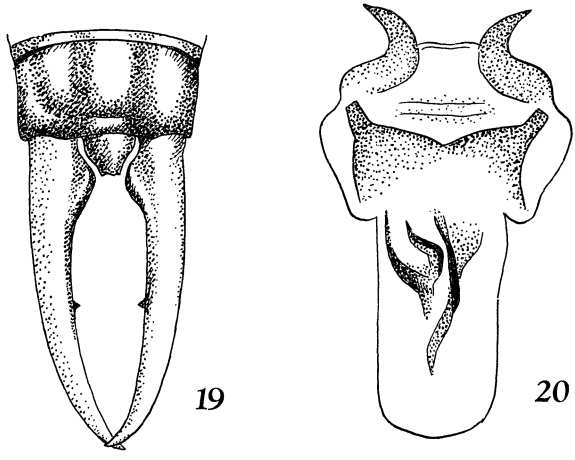
Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♀, 14 Aug. 1961.

Bismarck Islands. — DYAUL: Sumuna, 1 ♂, 4 March 1962.

Spongovostox hakeni spec. nov. (Figs. 19 and 20).

Philippines. — TAWI TAWI: Tarawakan, 1 ♂ (Holotype), 14 Nov. 1961. In the Zoological Museum, Copenhagen.

Male: Head, dark brown, tumid, sutures very faint; eyes longer than first antennal joint, cheeks smooth, caudal margin feebly sinuate. Antenna, 16 joints, 4th half as long as 3rd, 5th and 6th subequal and shorter than 3rd, rest a little longer, subcylindrical, all segments shorter than 3rd. Pronotum, chestnut, paler along sides, trapezoidal, anterior border narrower than head; prozona tumid and well raised over depressed metazona and sides, median sulcus distinct. Elytra, brownish with a yellow band extending the entire length, lateral regions pubescent. Wing scales, yellow with a fuscous band near inner margin. Legs, femora brown, tibiae and tarsi yellow, first tarsal longer than third, second about half as long as third. Abdomen, chestnut brown, broadest across middle, glandular fold on segment 3 distinct. Ultimate tergite, transverse, smooth, disc distinct, feebly sulcate in the caudal half, caudal margin gently sinuate and slightly raised over base of forceps. Pygidium, broad at base, narrowed at free end. Forceps, moderately depressed, straight, broad at base, tapering towards apex, smooth except for a single well developed tooth dorsomesad; inner margin swollen near base and with a feeble carina dorsad



Figs. 19—20. *Spongovostox hakeni* spec. nov. (19) Holotype male, ultimate tergite and forceps. (20) Male genitalia.

in this region. Penultimate sternite, broadly rounded, posterior margin sinuate mesad. Genitalia, Fig. 20.

Total body length 7 mm.; length of forceps 3 mm.

Of the two species *(S. semiflavus* and *S. gracilis* Borelli) so far known from the Philippines, *hakeni* has a closer resemblance to *semiflavus,* from which it differs in the nature of the forceps. The genitalia is of a peculiar shape and does not resemble that of any other species of the Spongiphorinae in which it is figured.

Irdex philippinensis spec. nov.

Philippines. — TAWI TAWI: Tarawakan, 2 ♀ (Holotype and Paratype), 21 Oct. 1961. In the Zoological Museum, Copenhagen.

These two females offer characters sufficient to establish a new species even without the male. They differ from *I. nitidipennis* (Borm.) and *I. novaeguineae* Boeseman (the only two species known under this genus) in the dense pubescence of the body and the much narrower pronotum with parallel and truncate sides. Female: General colour, orange, antenna, pronotum and elytra lighter. Head, depressed, cordiform, median suture alone distinct; Antenna, typical of the genus. Pronotum, narrower than head, longer than broad, rectangular, angles sharp. Elytra, nearly one and a half times longer than pronotum, sides parallel, margins truncate. Abdomen, broadest across middle, glands on tergites 3 and 4 distinct. Ultimate tergite, sparsely pubescent, distinctly tumid above base of forceps. Forceps, trigonal, broad at base, gently narrowed and curved at apex; lower inner margin with a distinct concavity basad terminating in a tooth, dentate beyond, subapical region smooth. Penultimate sternite, rectangular, caudal margin broadly rounded.

Length of body 6.5 mm.; of forceps 2.5 mm.

Subfamily LABIINAE.

Chaetospania thoracica (Dohrn).

Platylabia thoracia Dohrn 1867, Stett. Ent. Ztg., 28:348.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂, 21 May 1962.

Several species are mixed up under this name and the real status of *thoracica* should await a revision of the genus.

Chaetospania sp.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♀, 10 May 1962, in rotten wood.

Labia pilicornis (Motsch.).

Forfiscelia pilicornis Motschulsky 1863, Bull. Soc. Nat. Moscou, 36 pt. 11:2 (Ceylon).

Labia rehni Hebard 1917, Ent. News, 28:317—319. New Syn.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 2♀, 23 May 1962. — MUSSAU: Talumalaus, 1 ♀, 1 Feb. 1962. — MANUS: Lorengau, 1 ♂, 19 June 1962.

Philippines. — PALAWAN: Pinigisan, 600 m, 2 ♀, 7 and 19 Sept. 1961.

One of the females of this series was sent to Dr. H. Radcliff Roberts of the Academy of Natural Sciences, Philadelphia, for comparison with the type female of *Labia rehni* Hebard which this species resembled. Dr. Roberts found the type specimen carrying an extra label with the name *L. pilicornis* (Motsch.) written by Hebard in 1932. This synonymy has not been mentioned in literature so far. Dr. Roberts has also compared *rehni* with *pilicornis* from the Hawaiian Islands, Tahiti, Guam and Sumatra and found them conspecific.

Labia curvicauda (Motsch.).

Forfiscelia curvicauda Motschulsky 1863, Bull. Soc. Nat. Moscou, 36 pt. 11:2 (Ceylon).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1♂, 8 May 1962; Valoka, 1 ♀, 8 July 1962; — NEW IRELAND: Lemkamin, 900 m, 3 ♂, 7 ♀, 15 and 16 April 1962.

Philippines. — MINDANAO: Curuan district, Sapamoro, 1 ♂, 2 ♀, 3 nymphs, 20 Dec. 1961.

Labia bihastata (Borg).

Platylabia bihastata Borg 1904, Ark. Zool., 1:572 (Cameroon).

Labia curvicauda (Motsch.), Burr 1907, Berl. ent. Zeit., 52:205 (in part) and subsequent authors.

Labia bihastata (Borg), Hincks 1948, Ent. mon. Mag., 84:94 (redescription and male genitalia).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♀, 10 May 1962.

Prolabia sp.

Bismarck Islands. — NEW BRITAIN: Valoka, 1 ♂, 9 July 1962. — DYAUL: Sumuna, 1 ♀, 4 March 1962.

Prolabia spec. nov.? (Figs. 21—22).

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♂, 14 Aug. 1961. — TAWI TAWI: Tarawakan, 1 ♀, 4 Nov. 1961.

This pair is quite distinct from *P. luzonica* Dohrn, the only allied species known from the Philippines. It also differs from the other Oriental species *P. nigrella* (Dubrony) in general colouration and length of forceps. The male is unfortunately broken in a way which prevents examination of the genitalia, and the species must be left unnamed untill a good male is available for detailed description.

Subfamily SPARATTINAE.

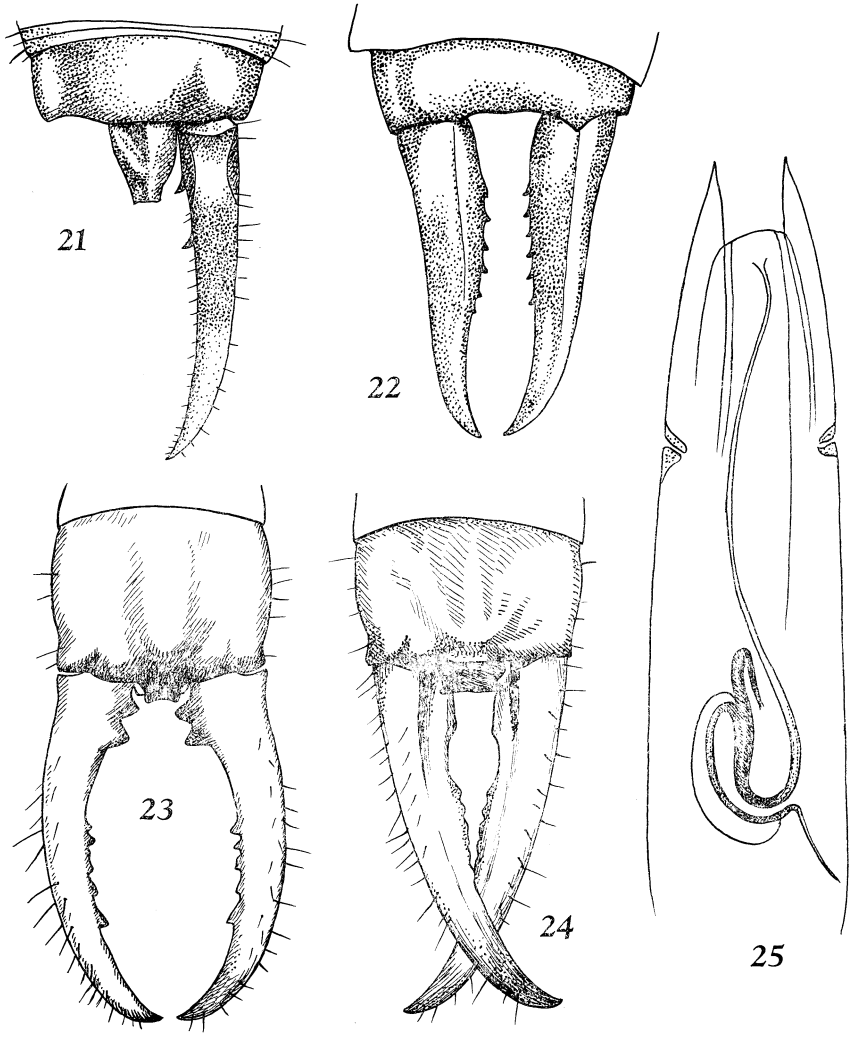
Auchenomus forcipatus spec. nov. (Figs. 23—25).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂ (Holotype), 13 May, 1 ♀ (Allotype), 14 May and 3 ♂, 1 ♀ (Paratypes), 14—21 May 1962. — LAVONGAI: Banatam, 1 ♂, 2 ♀ (Paratypes), 25 March 1962. In the Zoological Museum, Copenhagen, except two paratypes in my collection.

Male: General colour, head, pronotum, legs and 1st antennal joint clear yellow, rest of antennal joints and abdomen reddish brown, wings dark brown, forceps orange. Pubescence restricted to sides of abdomen and forceps.

Head, flattened, broadest across eyes, post ocular region convex, frons tumid with a slender longitudinal ridge near margin of eyes; caudal margin distinctly notched mesad. Antenna, 13 + segments, 1st narrow and constricted basad, expanded and parallel sided beyond, 2nd very small, 3rd and 4th subequal and cylindrical. Pronotum, longer than wide, sublateral region with a distinct carina running down to two thirds the length; prozona tumid and separated from sides and metazona by a dark line; sides truncate, caudal angles rounded. Elytra, nearly one and a half times the length of pronotum, costal and humeral margins parallel, humeral angles rounded, cephalic margin oblique, with a broad scutellum hidden by pronotum; caudal margin weakly sinuate; sparse pubscence. Wing scales, with inner and outer margins parallel, caudal margin truncate. Legs, normal for the

genus. Abdomen, expanded caudad, tergites with fine pubescence and a pair of strong setae on posterior border well separated from the median line. Ultimate tergite, very large, almost a square, a broad 'V' shaped puncture in the caudal region; caudal margin



Figs. 21—22. *Prolobia* spec. nov.? Ultimate tergite and forceps of male (21) and female (22).

Figs. 23—25. *Auchenomus forcipatus* spec. nov. (23) Holotype male, ultimate tergite and forceps. (24) Allotype female, ultimate tergite and forceps. (25) Holotype male, genitalia.

trisinuate, obliquely raised above base of forceps, mesal cavity very dark and with a prominent tubercle above margin of pygidium. Pygidium, short, transverse, declivent, the upper region produced into a pair of mammae. Forceps, broad at base, narrowed and arcuate behind, inner margin with a pair of large pyramidal tubercles, the region beyond smooth up to one third the distance, then serrated up to apical third, subapical region smooth and curved. Penultimate sternite, almost a square, sides and caudal margin convex, caudal angles rounded. Male genitalia, Fig. 25.

Body length 10—11 mm., length of forceps 2—3 mm.

Female: Agrees with male in general. Caudal angles of wing scales rounded giving a different shape to the wing as compared with male. The arms of the 'V' shaped puncture of the ultimate tergite more divergent. Pygidium unusually as in male. Forceps not expanded basad, with a concavity a short distance beyond base, serrated and tuberculate beyond, subapical region smooth and curved.

Length of body 9—10 mm., length of forceps 2.75—3 mm.

This species does not resemble any of the described forms and the shape and the armature of the forceps are distinctive as compared with other species.

Superfamily **FORFICULOIDEA.**

Family **LABIDURIDAE.**

Subfamily LABIDURINAE.

Labidura riparia var. **inermis** Brunner.

Labidura riparia var. *inermis* Brunner, 1882, Prodr. Europ. Orthopteren, Leipzig.

Philippines. — BALABAC: Dalawan Bay, 1 ♂, 8 Oct. 1961.

Subfamily APACHYINAE.

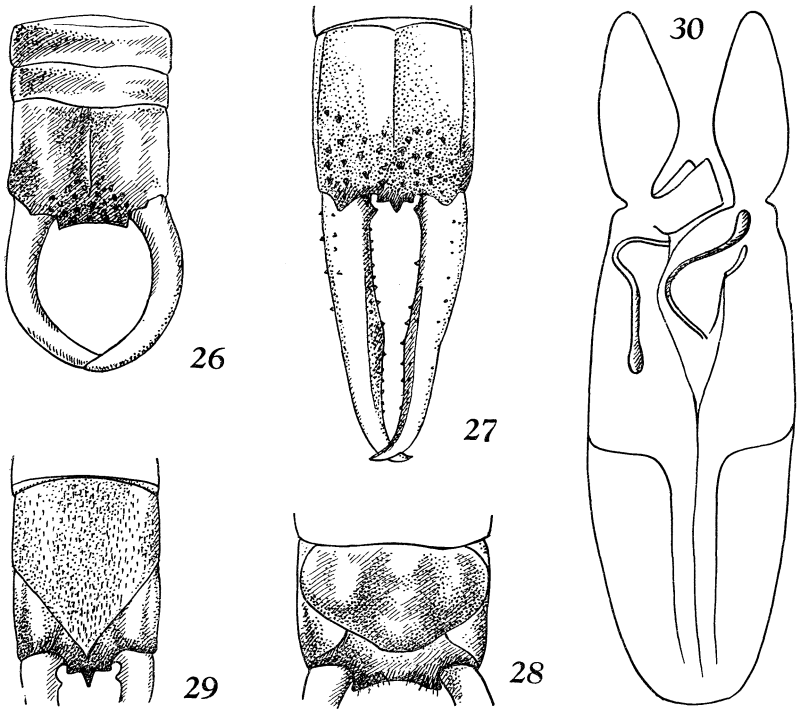
Apachys beccari Dubrony.

Apachys beccari Dubrony 1879, Ann. Mus. Stor. nat. Genova, 14:349.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 3 ♀, 4 nymphs, 16 May 1962.

Dendroiketes similis spec. nov. (Figs. 26—30).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂



Figs. 26—30. *Dendroiketes similis* spec. nov. (26) Holotype male, last three tergites and forceps. (27) Allotype female, last tergite and forceps. (28) Penultimate sternite of male. (29) Penultimate sternite of female. (30) Male genitalia.

(Holotype), 1 ♀ (Allotype), 16 May 1962, 3 ♂, 1 ♀, 29 nymphs, 9—22 May 1962. In the Zoological Museum, Copenhagen, except for two paratypes in my collection.

Male: General colour dark brown with dirty whitish patches on head, tegmina and wings; body smooth except last abdominal tergite, granulose.

Head, transverse, tumid, sutures distinct; eyes half as long as genae; occipital region with two distinct tumid areas, the region in between dirty-whitish. Antenna, more than 35 segments, 1st very thick, 2nd small, 3rd longer than first, slender and cylindrical, 4—8 short, as broad as long, rest conical, stout up to middle, slender beyond. Pronotum, rectangular, median sulcus distinct, prozona tumid, metazona depressed and with a dirty-whitish patch on either side of median line; cephalic and caudal

margins truncate, sides thick, angles rounded. Elytra, nearly twice as long as pronotum, weakly punctured and with a broad whitish area in the anterior half; cephalic margin obliquely trunctate exposing a broad and pointed scutellum, caudal margin obliquely rounded. Wing scales, nearly three fourths the length of elytra, sides brown, inner margin brownish yellow. Legs, femur very long and rectangular, dark brown except distal region, yellowish, tibiae and tarsi clear yellow, 1st tarsal slightly expanded distally, third slender and cylindrical, longer than first. Abdomen, feebly depressed, slightly expanded caudad, tergites very weakly punctulate. Ultimate tergite, rectangular with a deep furrow at middle, caudal half sparsely denticulate. Anal process, very little produced, concave with a row of short yellow hairs along ventral margin. Forceps, short, cylindrical, inner margin of apical half obliquely compressed; arcuate. Penultimate sternite, transverse, caudal margin broadly triangular. Male genital armature, Fig. 30.

Body length 21.5 mm., length of forceps 3 mm.

Female: Agrees with male except in the nature of anal process, ultimate tergite and forceps. Anal process very narrow and dorsal surface triangular and drawn into a peg, ventral surface flat and looked from above appearing like a wing on either side of the peg. Ultimate tergite longer than broad with a triangular depression mesad on anterior border, caudal half strongly punctulate and with strong denticles. Forceps, very long, inner surface compressed, lower inner margin with a prominent tubercle near anal process, drawn into a hump at middle, gently tapering to apex; tip incurved; upper surface denticulate. Penultimate sternite rectangular, caudal margin acuminate.

Body length 24—26 mm., length of forceps 6.5—7 mm.

This species is closely related to *D. novoguineae* Boeseman, from which it could be distinguished by differences in general colouration and the smoothly rounded outer margin of male forceps.

Subfamily ALLOSTETHINAE.

Allostethus sp.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 nymph, 18 Aug. 1961.

Family CHELISOCHIDAE.

Proreus ludekingi (Dohrn). (Fig. 31).

Lobophora ludekingi Dohrn, 1865, Stettin. ent. Zeit., 26:73.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 6 ♂, 6 ♀, 14—26 Aug. 1961. — TAWI TAWI: Lapid Lapid, 1 ♀, 21 Nov. 1961. — MINDANAO: Curuan district, Sapamoro, 1 ♀, 14 Dec. 1961.

Proreus simulans (Stål).

Forficula simulans Stål 1860. Kungl. Svenska Freg. Eugenie's Resa, 1:302 (Java).

Bismarck Islands. — MUSSAU: Talumalaus, 1 ♀, 10 Feb. 1962.

This species is widely distributed throughout the Oriental region.

Chelisoches morio (Fabr.).

Forficula morio Fabricius 1775, Syst. Ent. p. 270.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 20 Aug. 1961. — TAWI TAWI: Tarawakan, 1 ♂, 14 Nov. 1961.

Bismarck Islands. — NEW BRITAIN: Valoka, 1 ♂, 3 ♀, 7—10 July 1962; Yalom, 1000 m, 2 ♂, 6 ♀, 1 nymph, 8—18 May 1962. — NEW IRELAND: Lemkamin, 900 m, 2 ♂, 3 ♀, 3 nymphs, 16—23 April 1962. — LAVONGAI: Banatam, 1 ♂, 20 March 1962; Undalago, W. of Banatam, 1 ♂, 2 ♀, 22 Feb. 1962. — MUSSAU: Talumalaus, 1 ♀, 5 Feb. 1962.

Solomon Islands. — GUADALCANAL: Honiara, 1 ♂, 1 ♀, 27 July 1962.

This large series of one of the cosmopolitan species exhibits a wide range in intraspecific variation of forceps and body colour.

Chelisoches imitator spec. nov.

Bismarck Islands. — LAVONGAI: Banatam, 1 ♂ (Holotype), 1 ♀ (Allotype), 24 March 1962. In the Zoological Museum, Copenhagen.

This species is very close to *C. morio* in major external characters but can be easily distinguished by the small stature. The antennae and wing scales are reddish brown, the legs golden yellow. Pygidium of the female is distinct, drawn into a cylindrical rod. The meta-parameres are narrower and the virga short. The basal region of preputial sac carries a dense cluster of chitinous papillae.

Body length of male 13 mm.; of forceps 4 mm.
Body length of female 12 mm.; of forceps 4.5 mm.

Chelisoches diodontus spec. nov. (Fig. 32).

Bismarck Islands. — LAVONGAI: Banatam, 1 ♂ (Holotype), 17 March 1962. In the Zoological Museum, Copenhagen.
Male: Body black, limbs golden yellow. Head, with inflated frons and occipital regions. Pronotum, longer than broad, not broader than head anteriorly, slightly expanded caudad, caudal angles rounded, cephalic angles sharp, anterior margin convex mesad, sides truncate. Elytra and wings, well developed. Abdomen, cylindrical, smooth. Ultimate tergite, tumid above base of forceps, not crested. Forceps, cylindrical, heavy, broad at base, narrowed to apex, inner margin with two strong peg-like teeth half way

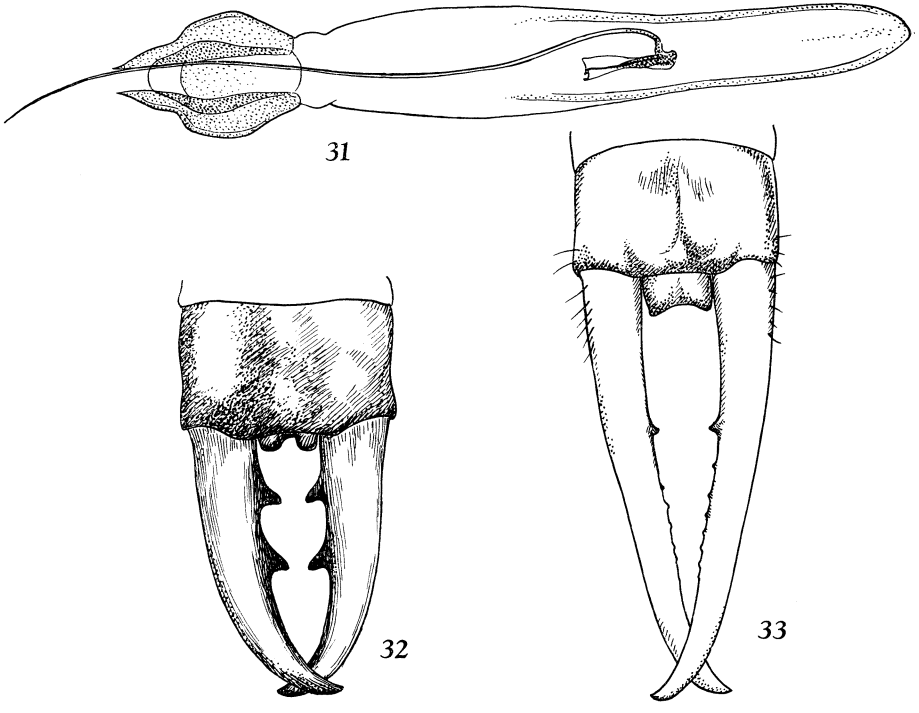


Fig. 31. *Proreus ludekingi* (Dohrn). Male genitalia. — Fig. 32. *Chelisoches diodontus* spec. nov. Holotype male, ultimate tergite and forceps. — Fig. 33. *Adiathetus proreoides* spec. nov. Holotype male, ultimate tergite and forceps.

from base. Pygidium, short but distinct, strongly emarginate, appearing bilobed seen from above.

Body length 10.5 mm., length of forceps 2.5 mm.

This male is more closely related to *C. bimammatus* Hebard from which it could be distinguished by the colour of the limbs and the armature of the forceps.

Adiathetus proreoides spec. nov. (Fig. 33).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂ (Holotype), 9 May 1962. In the Zoological Museum of Copenhagen. Male: Head, prozona and ultimate tergite orange, sides of pronotum, legs, elytra and forceps golden yellow, antenna, wing scales and abdomen dark brown.

Head, transverse, depressed, frons and cheeks moderately inflated; antenna, 17+ segments, 3rd long, clavate, 4th short, oval, rest gradually elongated, subcylindrical.

Pronotum, narrower than head, almost a square; prozona tumid, sides and metazona depressed, sulcus distinct, extending to caudal margin, lateral margins truncate, caudal margin deeply convex, angles rounded. Elytra and wing scales, fully developed. Legs, normal for the genus. Abdomen, cylindrical, segments 1—9 punctulate, 4—8 with a row of fine tubercles along posterior border. Ultimate tergite, smooth, disc not separated from sides, sulcus very weak, basal region tumid over base of forceps, caudal margin feebly sinuate mesad. Forceps, very long and slender, cylindrical, broad at base, tapering to apex, compressed for a short distance basad, with a prominent tooth less than half the distance from base, a few indistinct tubercles inside on apical half. Pygidium, short and broad, deeply sinuate mesad. Penultimate sternite, broad, rectangular, caudal margin rounded, emarginate mesad.

Body length 10 mm., length of forceps 5 mm.

The genus *Adiathetus* Burr includes five species of which three are confined to the Indian subcontinent. The present male is unique in its colouration resembling some members of *Proreus*. In the long and slender forceps it is closer to *A. shelfordi* (Burr) described from Sarawak, but could be distinguished from it by the nature of the abdominal tergites and the more simple forceps.

Genus **Euenkrates** Rehn.

Euenkrates Rehn 1927, Ent. News 38: 148—9 (type *Sphingolabis variegata* Kirby).

Enkrates Burr 1907, Trans. ent. Soc.: 126, 132.

Rehn discusses the need for renaming Burr's *Enkrates* due to the confusion created by the latter in misidentifying *Forficula flavipennis* Fab. (a member of *Chelisoches)* and designating it as the type of *Enkrates* in the place of *Sphingolabis variegatum* for which the genus was in fact meant. Consequently, *Enkrates* became isogeneric with *Chelisoches.* In spite of this clarification, Boeseman (1954) refers the other species *elegans* Burr under the genus *Enkrates.* Also, Towns (1945), in his list of generic names, treats *Euenkrates* as monotypic for *S. variegatum.* These discrepancies in literature could, perhaps, be attributed to Towns and Boeseman not consulting Burr (1912a) and Rehn (loc. cit.), respectively.

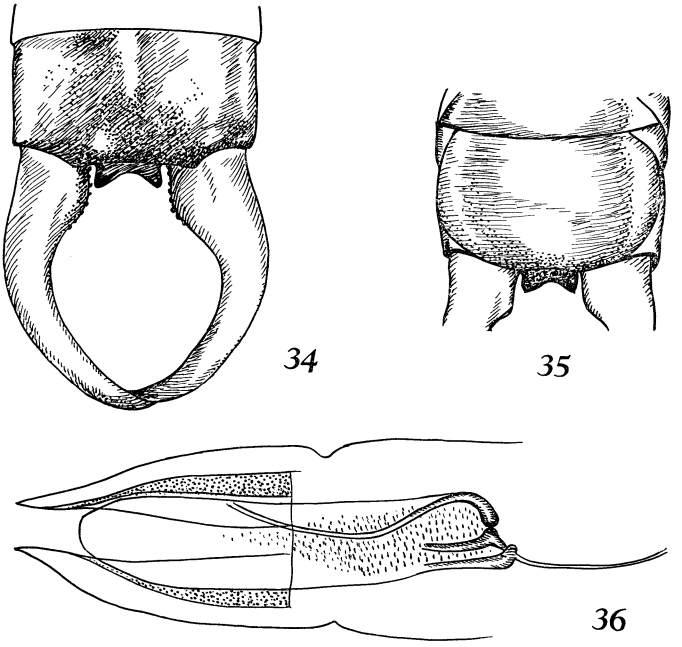
The genus *Euenkrates,* as known at present, should include two species, *E. variegatum* and *E. elegans,* the former restricted to Tropical Africa and the latter known only from Java and Sumatra. The species described here differs from both of these in the more slender build and the narrower pronotum. Besides, the forceps is characteristically arcuate and smooth except for a few indistinct tubercles at base.

Euenkrates simplex spec. nov. (Figs. 34—36).

Bismarck Islands. — NEW IRELAND: Lemkamin, 900 m, 1 ♂ (Holotype), 15 April 1962. — MANUS: Lorengau, 1 ♂ (Paratype), 18 June 1962. In the Zoological Museum, Copenhagen.

Male: General colour, uniformly reddish brown except narrow lateral areas of pronotum, pale yellow.

Head, tumid, smooth, sutures obsolete, caudal margin sinuate; antenna, 17+ segments, 1st large and swollen, 2nd smallest, 3rd and 5th subequal, 4th shorter than 3rd, rest a trifle longer than 3rd, subconical. Pronotum, as broad as long, slightly contracted caudad, sides convex, cephalic and caudal margins truncate, anterior angles sharp, posterior angles rounded; prozona tumid and well separated from the depressed sides and slightly elevated metazona; sulcus strong and extending to more than three fourths the distance of metazona. Elytra and wings well developed, the former twice as long as pronotum, smooth and caudal, margin obliquely sinuate away from sutural margin. Abdomen, moderately depressed, parallel sided, very feebly punctulate, glandular folds on 3 and 4 well developed. Ultimate tergite, transverse, smooth, area above base of forceps tumid, the region in between



Figs. 34—36. *Euenkrates simplex* spec. nov. Holotype male. (34) Ultimate tergite and forceps. (35) Penultimate sternite. (36) Genitalia.

sloping down; caudal margin trisinuate and raised above base of forceps. Pygidium, short, free margin deeply sinuate. Forceps, short, arcuate, swollen at base, slender and tapering beyond, inner margin with indistinct denticles at base. Penultimate sternite, broadly rounded, feebly emarginate mesad.

Male genitalia, Fig. 36.

Body length 7.5—9 mm., length of forceps 2 mm.

Hamaxas nigrorufus (Burr).

Spongiphora nigrorufa Burr, 1902, Term. Fuzet., 25:4.

Hamaxas nigrorufus (Burr), Burr, 1915, Tijd. Ent. Suppl., 58:118.

Sparattina nigrorufa (Burr), Zimmerman, 1948, Insects of Hawaii, 2:210, fig. 114.

Bismarck Islands. — NEW BRITAIN: Bita Paka, S.E. of Kokopo, 1 ♂, 10 July 1962. — LAVONGAI: Banatam, 1 ♂, 19 March 1962. — MUSSAU: Talumalaus, 4 ♂, 2 ♀, 19 Jan. — 1. Feb. 1962. — MANUS: Lorengau, 4 ♂, 5 ♀, 14—21 June 1962.

Philippines. — PALAWAN: Pinigisan, 600 m, 2 ♀, 8 and 11 Sept. 1961; Tagembung, 1150 m. 1 ♀, 20 Sept. 1961.

The Philippine females agree with those of the good series from the Bismarck Islands, except for the shape of pronotum. Only the discovery of a male from the Philippine locality could confirm their identity.

It should be mentioned that Zimmerman's figure of this species is different from the males in the Bismarck material, and it is possible that the Hawaiian male is a distinct species.

The specimens from Manus and Mussau have black legs while in others the legs are reddish brown.

Family **FORFICULIDAE.**

Subfamily EUDOHRNINAE.

Kosmetor tagalensis Borelli.

Kosmetor tagalensis Borelli, 1915, Bull. Mus. Zool. Anat. comp. Torino, 30 nr. 697:6.

Philippines. — MINDANAO: Curuan district, Sapamoro, 1 ♀, 22 Dec. 1961.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♀, 18 May 1962.

Subfamily OPISTHOCOSMINAE.

Opisthocosmia cervipyga Kirby (Fig. 37).

Opisthocosmia cervipyga Kirby, 1891, Jour. Linn. Soc. Zool. 23: 523, pl. 12, f. 12.

Philippines. — PALAWAN: Pinigisan, 600 m, 5 ♂, 3—10 Sept. 1961.

These males agree well with the original description by Kirby.

Genus **Acanthocordax** Günther.

Acanthocordax Günther, 1929, Mitt. Zool. Mus. Berlin, 5:72.

Stenixus Hebard, 1933, Mem. Queensland Mus., 10, pt. 3: 154—156. (type *S. rachynotus)*.

Stenixus Hebard, Günther 1934, Konowia 13:287 (new synonymy).

While *Acanthocordax* was characterised by a strong spine at the cephalic angles of pronotum, Hebard distinguished *Stenixus* by the presence of a distinct tubercle in this region. Günther, however, did not consider this difference sufficient enough to merit generic distinction and thus Hebard's genus was sunk in *Acanthocordax, rachynotus* being treated only as a subspecies of *A. papuanus* Günther.

In the nature of the forceps, the species described below bears a closer resemblance to *rachynotus* than to either of the species of *Acanthocordax*. Further, the cephalic angles of pronotum are also characterised by the tubercle only. It is possible that Hebard's genus may have to be revalidated when the male genitalia of *rachynotus* and *A. bispinosus* (type of *Acanthocordax)* are available for comparison.

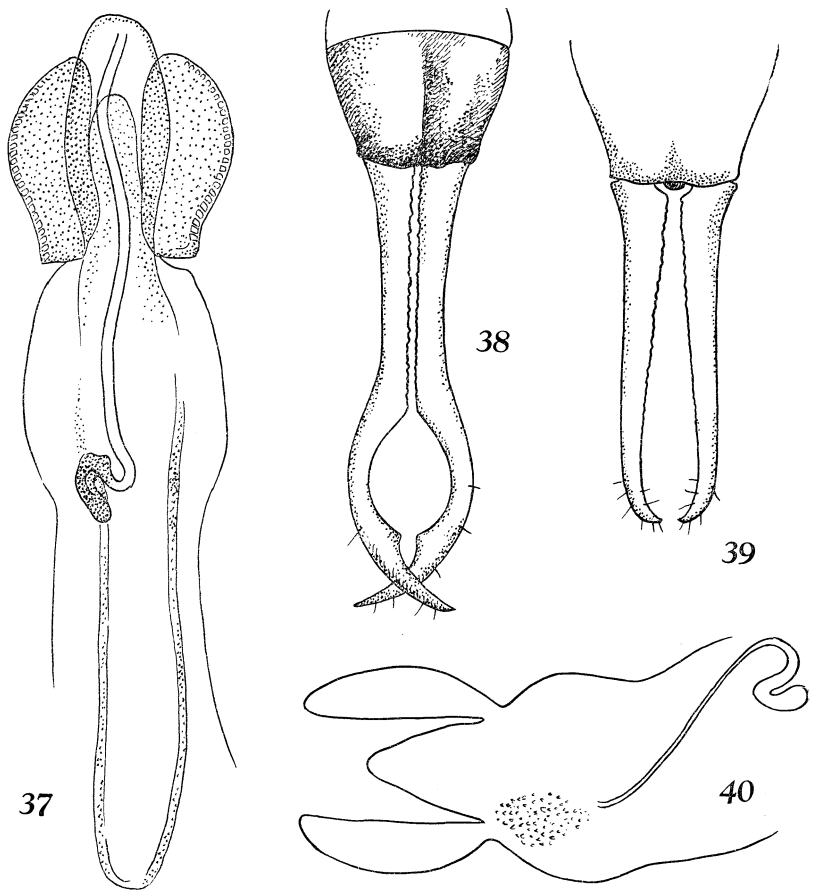


Fig. 37. *Opisthocosmia cervipyga* Kirby. Male genitalia. — Figs. 38—40. *Acanthocordax spatulatus* spec. nov. (38) Holotype male, ultimate tergite and forceps. (39) Allotype female, ultimate tergite and forceps. (40) Holotype male, genitalia.

Acanthocordax spatulatus spec. nov. (Figs. 38—40).

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 1 ♂, 1 ♀ (Paratypes), 2 nymphs 12—19 May 1962. — NEW IRELAND: Lemkamin, 900 m, 1 ♀ (Allotype), 7 April 1962, 1 ♀ (Paratype), 17 April 1962. — LAVONGAI: Banatam, 1 ♂ (Holotype), 18 March 1962. Types in the Zoological Museum, Copenhagen, except for a paratype in my collection.

Male: General colour reddish brown.

Head, tumid, sutures sunken; eyes shorter than genae; antenna, 12 segments, 1st long and thick in distal half, 2nd very short, 3—6 subequal, slender, shorter than 1st, rest longer. Pronotum, long and narrow, prozona tumid, separated from depressed metazona by a transverse ridge, lateral margins thick leaving a fine groove along entire length. Elytra, smooth, shoulders broadly rounded, cephalic margin oblique exposing a distinct scutellum. Wing scales, nearly half the length of elytra. Abdomen, tergites finely granulose, 3rd broadly sinuate. Ultimate tergite, a distinct blunt tubercle above base of forceps. Forceps, long, shaft cylindrical up to half the distance, inner margin crenulate, then slightly flattened, deeply bowed, a distinct tooth at the tip of concavity, subapical region arcuate and smooth. Pygidium, very small, hidden as seen from above. Penultimate sternite, triangular, broadly rounded. Male genitalia, Fig. 40.

Body length 6.5 mm., length of forceps 3.5—4 mm.

Female: Agrees with male in general. Pygidium more distinct and appearing in the form of a lobe seen from above. Forceps simple, inner margin crenulate.

Body length 10 mm., length of forceps 3 mm.

This species differs from *Acanthocordax papuanus rachynotus* Hebard, described from New Guinea in the more specialised subapical region of the forceps.

Acknowledgments.

Dr. David R. Ragge was kind enough to send me a list of the Philippine Dermaptera in the collections of the British Museum (Nat. Hist.) through Mr. John Huxley, and I am happy to acknowledge this help. Dr. Fred Keiser of the Naturhistorisches Museum, Basel, prepared for me an outline sketch of the ultimate tergite and forceps of type male of *Epilandex handschini* Hincks. I am grateful to him for this kindness.

I wish to express my sincere thanks to Dr. William L. Peters of the Department of Entomology, A and M University, Florida, for helping me with a valuable collection of papers dealing with American Dermaptera. I acknowledge the kindness of Dr. H. Radcliff Roberts of the Division of Entomology, Academy of Natural Sciences, Philadalphia, in comparing the female of *Labia pilicornis* (Motsch.) sent to him with the type of *L. rehni* Hebard. My thanks are due to Mr. Allen Brindle of the Manchester Museum, for the information concerning the distribution of Brachylabinae from his unpublished paper, and for sending me photostat copies of Günther's papers. I thank Dr. T. N. Ananthakrishnan and the authorities of the Loyola college for laboratory facilities.

Summary.

Records are made of Dermaptera from the Philippines (Palawan, Balabac, Tawi Tawi and Mindanao), the Bismarck Islands (including Manus I. in the Admiralty group) and Guadalcanal, Solomon Islands. One new subfamily is proposed. It contains two genera new to science, both from the Bismarck Islands. A total of 13 new species are described, belonging to the following genera: *Brachylabis, Epilandex, Physogaster* gen. nov., *Parapericomus* gen. nov., *Spongovostox, Irdex, Auchenomus, Dendroiketes, Chelisoches, Adiathetus, Euenkrates* and *Acanthocordax*. A generic key to the Dermaptera of the Bismarck Islands is presented.

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(Noona Dan Papers No. 50).

A Contribution to the Knowledge of Philippine Semiaquatic Hemiptera-Heteroptera.

By
N. Møller Andersen
Zoological Museum, Copenhagen, Denmark.

Among the insects collected in the Philippine Islands by the Danish "Noona Dan" Expedition in 1961 (Petersen 1966) is the small collection of semiaquatic Hemiptera discussed in this report. According to personal information from Dr. Børge Petersen, freshwater biotopes were rather scarce in the areas where collecting took place, viz. the islands Palawan and Balabac, the island Tawi Tawi in the Sulu Group, and the Zamboanga Province of Mindanao.

Family **GERRIDAE** Leach, 1817.

Subfamily **Gerrinae** Amyot & Serville, 1843.

Limnogonus (s. str.) fossarum (Fabr., 1775).

(For synonyms see Lundblad 1933, p. 374 and Esaki 1937, p. 360).

MINDANAO: Sapamoro, Curuan district, 16 Dec. 1961. 3 ♀ apt., 1 ♂, 2 ♀ macr.

This widespread oriental Gerrid was, in the Philippines, formerly reported only from Manila, Luzon (type locality for *Gerris discolor* Stål, 1859, which proved to be a synonym of *L. fossarum* according to Lundblad 1933, p. 377).

Distribution (compiled from Lundblad 1933, Esaki 1937, Usinger 1946, and Miyamoto 1964b.): Ryukyu Islands (south of Amami Oshima), Taiwan, S. China, Ceylon, India, Burma, Thailand, Malaya, ? Nicobar Islands, Sumatra, Java, Celebes, Philippines (Luzon, Mindanao; new record), Mariana Islands (Guam, Saipan), and Fiji Islands.

Limnogonus (s. str.) luctuosus (Montr., 1864).

(For synonyms see Lundblad 1934, p. 123).

PALAWAN: Brooke's Point, Uring Uring, 14 Aug. 1961; caught by Mercury-light 19.00—21.00. 1 ♀ macr.

This is the first record outside the Pacific and Papuan areas of this widely distributed species, the nearest locality (so far known) being the Palau Islands.

Distribution (compiled from Esaki 1937, Usinger 1946, and Laird 1956): Philippines (Palawan; new record), Mariana Islands (Guam), Palau Islands (Babelthuab), Murray Islands, New Caledonia, New Hebrides (Malekula), Fiji Islands (Viti Levu), Samoa Islands (Upolu), and Society Islands (Tahiti, Raiatea).

I have also seen a specimen from Bora Bora in the Society Islands.

Tenagogonus (Limnometra) ciliatus (Mayr, 1865).

(For synonyms see Hungerford & Matsuda 1958, p. 409).

BALABAC: Dalawan Bay, 12 Oct. 1961. 2 ♀ macr.

Previously only reported in the Philippines from Luzon. For distributional data see Hungerford & Matsuda (l.c., p. 411—412) and Andersen (1964, p. 333).

Tenagogonus (Limnometra) femoratus (Mayr, 1865).

(For synonyms see Hungerford & Matsuda 1958, p. 413—414).

BALABAC: Dalawan Bay, 12 Oct. 1961. 2 ♀ macr.

Previously recorded from some of the Philippine Islands (Samar, Mindanao, Basilan (Hungerford & Matsuda, l.c., p. 414—415), and Palawan (Banks 1909, p. 582—583)) and from Banguey Island, N. and E. Borneo (Hungerford & Matsuda, l.c.). Additionally, it is reported from Yonaguni and Kashoto Islands east of Taiwan (Miyamoto 1964b., p. 208).

Hungerford & Matsuda (l.c., p. 414) describe the variations in the colour pattern. The Bornean specimens have light reddish pronotum and bluish-black hemelytra with black veins, while individuals from Banguey and the Philippine archipelago only have a trace of pink on the pronotum, light brown hemelytra, and slightly darker veins. The specimens from Balabac are apparently intermediate between these two forms, having a light brownish pronotum with a faint tint of red, hemelytra brownish black with veins a little lighter. Unfortunately, the author has not been able to examine the specimens from Palawan.

Tenagogonus (Limnometra) nigripennis (Mayr).

Limnometra nigripennis Mayr, 1865, p. 443.

Gerris ?anadyomene, Banks, 1909, p. 583, pl. II, fig. 1.

PALAWAN: Mantalingajan, Pinigisan, 600 m., 14 Sept. 1961; (small, shallow puddle fed by a spring). 9 ♂, 17 ♀ apt., 9 nymphs.

A quite variable but very characteristic large water-strider endemic to the Philippines and reported from most of the larger islands (Hungerford & Matsuda 1958, p. 417—418). Banks (l.c) refers with doubt two Gerrids from Iwahig, Palawan to *"Gerris" anadyomene* Kirkaldy. However, judging from his figure of a macropterous individual and the short descriptive notes where he mentions the white annulations of the antennae, these specimens do not belong to this species but to *T. nigripennis.* Thus, the only record of *Tenagogonus (Limnometra) anadyomene* (Kirkaldy) from the Philippines is still that of Distant's (1904, p. 178).

Subfamily **Ptilomerinae** Esaki, 1927.

Ptilomera (s. str.) hungerfordi sp. nov. (Figs. 1—9).

Colour in apterous forms: Typical for the genus as described by Hungerford & Matsuda (1965, p. 399—400). The specimens of the type series quite dark owing to the black markings being larger than usual. Ground colour ferrugineous. In side view the longitudinal, black band on meso- and metapleuron has usually only a very faint longitudinal, yellowish stripe in middle. Abdominal tergites black, matt, except 8th segment above and anal cone in male, which are light brownish medially, and the small median spots on 2nd—4th and most of 7th tergite in female, which are ferrugineous. The black parts of the dorsal surface, the pleural area, and venter heavily covered with a short, silvery pile.

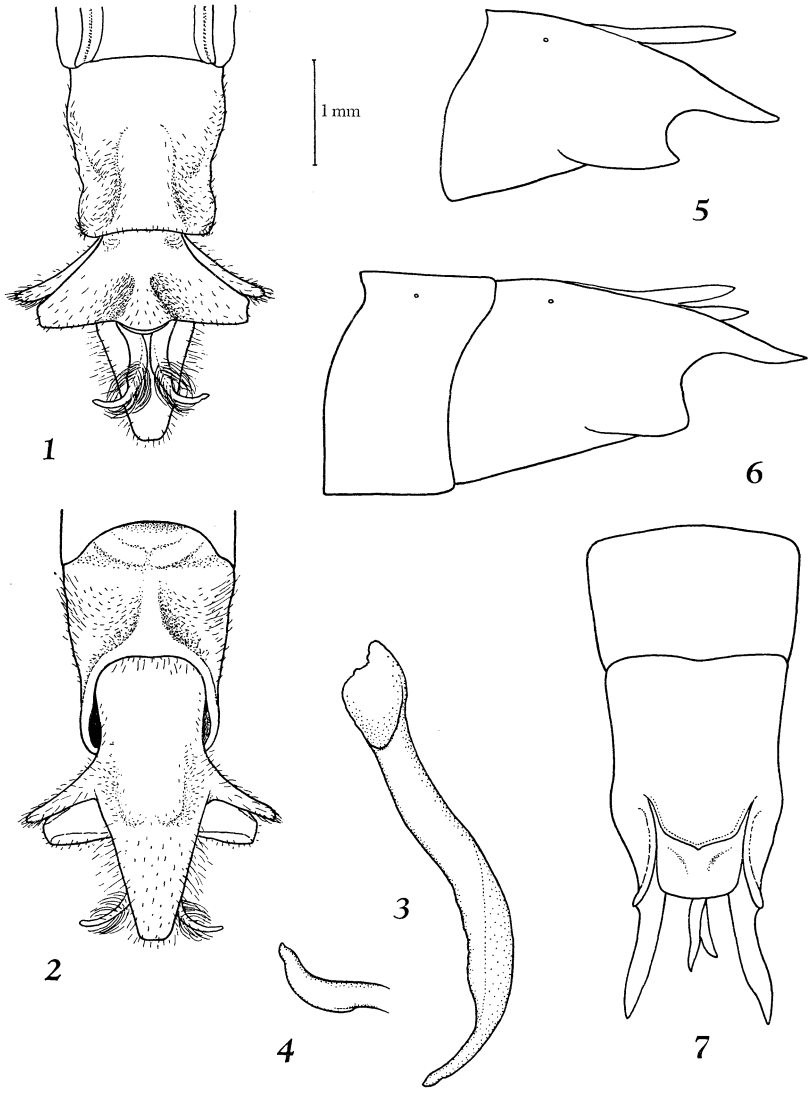
Structure of apterous forms:

	Measurements of the appendages. (Actual lengths in mm.).	
	Male holotype.	Female allotype.
Antennal formula (1st:2nd:3rd:4th):	8.80:2.00:2.45:1.70	7.40:1.60:2.00:1.48
Front leg (fem. :tib.:ta.1.:ta.2.):	9.05:7.85:4.50:1.90	7.78:6.70:4.15:1.65
Middle femur:	25.15	21.00
Hind femur:	33.30	24.65

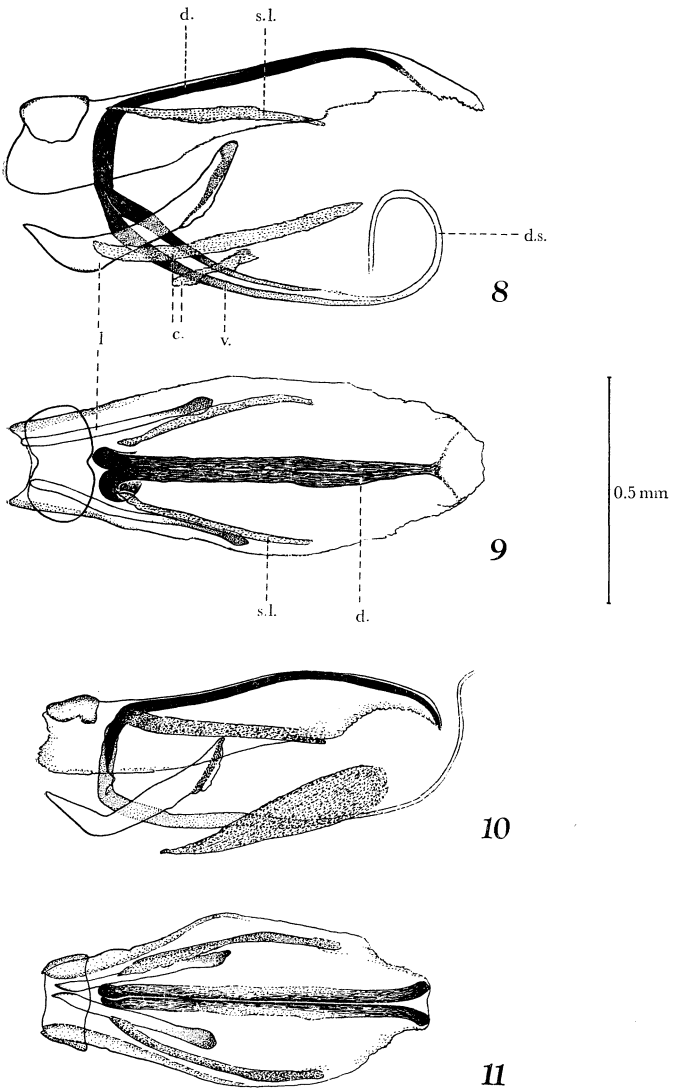
Apterous male: Relative lengths of thorax, 1st—7th tergite, and genital segments (dorsal view) in holotype: 269:192:135*); 7th tergite about twice as long as 6th; hind coxae reaching to about middle of 4th abdominal segment. Anal cone (fig. 1) relatively broad, greatest width: head width: 79:86 (holotype), with median part longitudinally raised, especially towards the rear margin; lateral wings rather long, pointing obliquely upwards, hind margins straight and pointing slightly in a posterior direction, not parallel with the front margins; median lobe small, slightly surpassing the lateral wings in some individuals; however, the 10th segment may protrude to a greater or lesser extent below the median lobe, reaching or surpassing an imaginary line between the posterior corners of the lateral wings. Pygofer as seen from below (fig. 2) moderately broad basally with faint, lateral impressions behind the dorsolateral projections and with apical half moderately slender and somewhat pointed; dorsolateral projections long and stout, in most specimens subparallel with the lateral wings of the anal cone and surpassing these by about one seventh of their length. 8th abdominal segment with a prominent median keel ventrally, above with short, lateral impression. Clasper densely haired toward apex with shaft much longer and broader than the arm, which turns obliquely laterad as seen from above (fig. 3); seen from behind the arm is curved obliquely dorsad, its sides not parallel (fig. 4). The apical part of phallus (endosoma) with a structure as shown in figs. 8 and 9, with endosoma surrounded by conjunctiva and the conjunctival sclerites thus superimposed on the endosomal sclerites.

Apterous female: Relative lengths of thorax and abdomen (dorsal view) in allotype: 240:264. Hind coxae reaching the middle of 3rd abdominal segment; 7th tergite a little longer than 6th. Connexival spine a little shorter than 7th tergite (40:48 in allotype); both dorso- and ventrolateral lobes present; dorsolateral lobe rather long; its upper margin from base of the connexival spine to the tip much less than twice as long as connexival margin of 7th abdominal segment; base of dorsolateral lobe broad, apical part tapering to a more or less downward-curved spine; incision between dorso- and ventrolateral lobes not as deep as wide; tip of the short ventrolateral lobe truncate or pointed, the variation

*) 1 unit = 0.025 mm.



Figs. 1—7. *Ptilomera (s. str.) hungerfordi* sp. nov. — Fig. 1. Apical part of male abdomen from above; most of the pubescence omitted. Fig. 2. do. from below. Fig. 3. Left clasper in male, dorsal view; hairs omitted. Fig. 4. do., seen from behind. Figs. 5—6. Outline of the apical part of female abdomen, lateral view, showing the variation of the ventrolateral lobe. Fig. 7. do., ventral view. Figs. 3—4 drawn in double magnification in relation to the other figures. Figs. 1—2 holotype, figs. 6—7 allotype, other figures paratypes, all from Palawan.



Figs. 8—9. *Ptilomera (s. str.) hungerfordi* sp. nov., paratype, and figs. 10—11. *Pt. (s. str.) harpyia* Schmidt, plesiotype. Apical part of phallus (endosoma) surrounded by conjunctiva showing the various sclerites. *c.* conjunctival sclerites, *d.* dorsal plate, *d. s.* ductus seminis, *l.* lateral plate, *s. l.* secondary lateral plate, *v.* ventral plate.

as shown on figs. 5—6. In lateral view the ventrolateral lobe is not as long as the 7th sternite before its base; distal lobe of 7th sternite keeled medially at base and directed obliquely dorsad, not hidden by the ventrolateral lobes (fig. 7).

Size of apterous forms (actual measurements in mm., holo- and allotype in paranthesis; M. = mean):

	Males:	Females:
Total length:	14.13—16.78 (16.50) M. 16.39	16.15—16.50 (16.45) M. 16.34
Width of head:	1.90—2.20 (22.15) M. 2.09	1.95—2.00 (1.96) M. 1.98
Width of pronotum:	1.98—2.45 (2.25) M. 2.25	2.00—2.10 (2.10) M. 2.06
Length of mesonotum:	3.00—3.70 (3.50) M. 3.45	3.15—3.35 (3.15) M. 3.25
Width across meso-acetabula:	3.20—3.95 (3.65) M. 3.62	3.63—3.78 (3.78) M. 3.73

Winged forms unknown.

Type material: Holotype male, allotype female, 5 ♂ 5 ♀ paratypes, all apterous, and 5 nymphs. Locality: Philippines, PALAWAN: Brooke's Point, Makagwa, 22 Aug. 1961, Noona Dan Exp. 1961—62. The locality was a small, swift-running river through párang-landscape. The types belong to the Zoological Museum of Copenhagen, 1 ♂ 1 ♀ paratypes are now in Field Museum of Natural History, Chicago.

Comparative notes: The new species is very similar to *Ptilomera harpyia* Schmidt, 1926 quoted by Hungerford & Matsuda (l.c., 467—470) from Burma, Thailand, Malaya, Cambodia, Laos, and the Philippines and to *Pt. harpyia ceramensis* Hung. & Mats., 1965 from Ceram. Unfortunately I have not been able to examine the single male specimen from the Philippines; this is probably not *Pt. harpyia* but belongs instead to the new species. Through the kindness of Dr. George W. Byers, Lawrence, Kansas the author has been able to compare some specimens of *Pt. harpyia* from "Laos, Tonkin" labeled "Plesiotype" by Hungerford with the type series of *Pt. hungerfordi* sp. nov. The new species is somewhat larger and the dark areas are more prominent. The anal cone in the male has more slender and longer lateral wings in *hungerfordi* (greatest width of anal cone 0.92× head

width in holotype, 0.85× in *harpyia* male plesiotype); median part of anal cone longitudinally raised in *hungerfordi,* suppressed in *harpyia.* Pygofer with lateral impressions ventrally, a feature absent in *harpyia,* distal half not as slender as in *harpyia;* dorsolateral projections of pygofer longer, surpassing lateral wings of anal cone. Claspers very similar, but the structure of the phallus shows some very marked differences (figs. 8—11): In *hungerfordi* (figs. 8—9) the dorsal plates (d.) are only partly separated, the ventral plate (v.) is well sclerotized and clearly bifid, and the conjunctival sclerites (c.) are divided and relatively small; the dorsal, sclerotized part of endosoma extending over the distal part of the dorsal plates. In *harpyia* the dorsal plates are well separated, especially at the apex, the ventral plate is apparently single and the conjunctival sclerites are large and distinct; dorsal part of endosoma not extended. The females of the two species are almost indistinguishable.

In the key to males of *Ptilomera* by Hungerford & Matsuda (l.c., p. 406—408) the new species run easily through to couplet 24, but compared with *Pt. harpyia* the distal half of pygofer is not unusually slender, its caudal tip not as pointed as in *harpyia* though not as blunt as in *Pt. dromas* Breddin. In the key to females *hungerfordi* runs out in couplet 55 to *Pt. dorceus* Breddin from N. Celebes as the ventrolateral lobe is shorter than the venter of 7th abdominal segment before it. However, I have seen females of a *Ptilomera* from Thailand with males which agree with the *harpyia* plesiotype and these, too, run out to *dorceus* instead of to the *tigrina-harpyia* couplet; thus, this character appears to be quite variable and not very useful in separating these obviously very similar species. The male of *dorceus* is unknown.

This is the second *Ptilomera* species reported from the Philippines (excluding the probably dubius *harpyia* specimen). The other species, *Pt. werneri* Hung. & Mats., 1958, also from Palawan is very characteristic, with a bifurcated clasper in male.

The new species is named in honour of the late Prof. H. B. Hungerford, Lawrence, Kansas in recognition of his great contribution to the clarification of the taxonomy of this very difficult genus.

Rheumatogonus borneensis Esaki, 1927. (Figs. 12—14, 16—17).

PALAWAN: Brooke's Point, Makagwa, 22 Aug. 1961; (small, swift-running river through párang-landscape). 1 ♂ 1 ♀ apt.

Rh. borneensis was formerly known only from the single female type from Pontianak, N. Borneo (Esaki 1927, p. 267—268, fig. 3d.). Through the kindness of Dr. P. Viette of Museum National d'Histoire Naturelle, Paris the author has been able to compare the Palawanese female specimen with the type of *borneensis,* and has found agreement in most respects. Apart from the specimens of the Danish expedition I have examined 3 ♂ 3 ♀ apterous labeled "Dimaniang, Busuanga Is., P.I. (Calamianes Group); nr. sea level; III: : 47; stream through forest; CNHM-Philippine Zool. Exped. (1946—47) H. Hoogstraal leg." from the Field Museum of Natural History, Chicago, and determined *"Rheumatogonus luzonicus* ? (Kirk.)" by Prof. H. B. Hungerford. However, they too agree with the *borneensis* type. These specimens have been given some consideration in the descriptional notes below.

Description of apterous male (fig. 13): Colour: Dorsal surface orange, venter light yellowish. Antennae, two small spots on vertex, anterior margin of pronotum lateral, and a longitudinal stripe in the middle of posterior half of mesonotum and on metanotum, blackish brown; the last mentioned stripe more or less widened at the meso-metanotal suture, reduced to a diamond-shaped spot in the male from Palawan. Front leg bluish-black except coxa, trochanter, and basal third of inner surface of femur; middle and hind legs bluish-black except coxae, trochanters, and proximal parts of femora. Dorsal surface of the basal three to five abdominal tergites yellowish brown except whole 1st tergite and parts of 2nd and 3rd tergite, as well as median parts of 4th and 5th tergite in some specimens, which are blackish brown; connexivum yellowish brown.

Structure: Much smaller than female, nearly parallel-sided. Eyes large, head a little broader than pronotum (36:33); proportional lengths of antennal segments: 1st:2nd:3rd:4th: 55:31: 31:23.5. Pronotum short, as long as an eye, lateral margins subparallel, without long hairs, only slightly constricted posteriorly, with rear margin faintly trilobated; mesonotum parallel-sided, prolonged (about 2.2 times as long as metanotum). Proportional lengths of leg segments:

	Femur	Tibia	Tarsus
Front leg:	83	59	11:13
Middle leg:	228	149 (?curved)	51:7 (?c.)
Hind leg:	238	66 (?c.)	3:5 (?c.)

Front femur thickened, greatest width (11 units) around middle; ventral surface of trochanter and femur with several long, black bristles; middle femur regularly tapering towards apex; hind femur thinner than middle femur, only slightly thickened in the basal part, elsewhere tapering. Abdomen shortened (notum about 1.8× tergite 1—7); 7th tergite a little longer than preceding two segments together (12:9.5); connexivum raised almost vertically. Sternite 2—6 very short; 7th sternite slightly shorter than sternites 3—6 together (8.5:9.5), its posterior margin simply concave; 8th abdominal and the genital segment extended, together longer than 7th sternite, structurally simple, without any modifications; claspers blackish, in resting position slightly protruding and just visible from above, falciform with a broad shaft and a slender, curved apical blade (fig. 14).

Size: Total length 4.08—4.23 mm. (apical abdominal segments protruding; length of body from anterior margin of pronotum to posterior margin of 7th tergite 3.10—3.38 mm.); width of head 0.86—0.91 mm.; width across mesoacetabula 1.05—1.11 mm.

Descriptive notes on female (fig. 12): The apterous females before me show some deviations from the type specimen, both in colour and structure.

Colour: Two dark spots on vertex; dark area on mesonotum broader, somewhat trilobate in front.

Structure: Esaki (l.c., p. 268) emphasizes the diagnostic value of the "strongly constricted conjunction between the head and prothorax" in the type female. However, an examination of the type revealed that this constriction is due to an extension of the head, probably caused by the preparation. Fig. 12 of the Palawanese female shows the head in normal position. Antennal formula: 72:37:35:28 beginning with the first segment. Pronotum transversely constricted posteriorly, lateral margins with long hairs; mesonotum about 2.0 times as long as metanotum. Proportional lengths of leg segments:

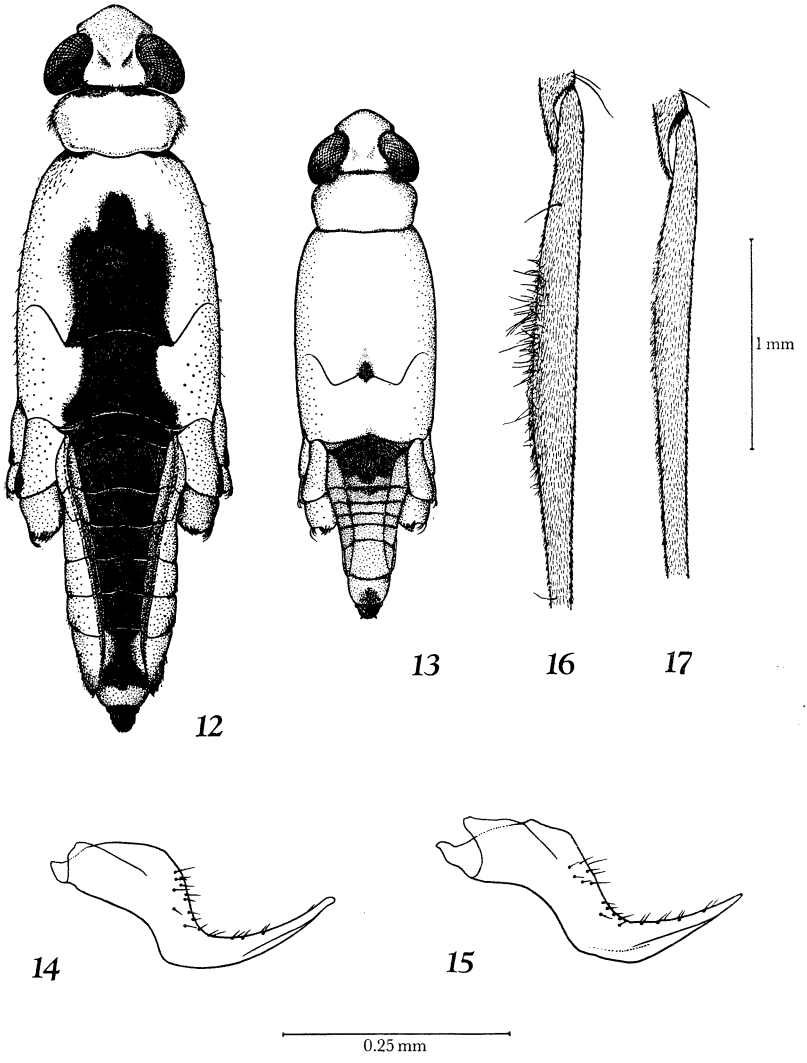
	Femur	Tibia	Tarsus
Front leg:	103	80	22:18.5
Middle leg:	290	190 (?curved)	56:18 (?c.)
Hind leg:	290	111 (?c.)	3.5:6 (?c.)

Front femur not as wide as in male (maximal 10.5 units); middle femur somewhat flattened and thickened basally, especially in the type female; hind femur dorso-ventrally flattened and

thickened in proximal fourth (figs. 16—17). In the females from Palawan and Calamianes (fig. 16) this dilatation is broader than middle femur basally (8:6.5) and provided with long hairs (only slightly shorter than femur width) on the ventral and dorsal surfaces near the inferior margin; in type female (fig. 17) the dilatation is not as broad as middle femur (6.5:8), the pubescence is more sparse and the hairs only half as long as width of dilatation. Abdomen shortened (notum about 1.2 times as long as tergite 1—7); tergites not entirely shiny, the shiny areas are reduced to an oval spot on each segment, while the lateral parts are covered with a pubescence of whitish hairs; 7th sternite longer than the preceding three sternites, posterior margin lobately produced in middle, covering ventral part of 8th segment; 9th segment bent downwards.

Size: Total length 5.43—6.00 mm. (type female 5.85, not 5.5 mm. as given in the original description); width of head 1.08—1.18 mm. (type female 1.18 mm.); width across mesoacetabula 1.60—1.79 mm. (type female 1.60 mm.).

Comparative notes: *Rh. borneensis* is obviously very closely related to *Rh. luzonicus* (Kirkaldy, 1909). Esaki (l.c., p. 266, fig. 3a-c) together with a redescription gives a figure of an apterous female of *luzonicus* with sides of pronotum evenly rounded in contrast to the posteriorly constricted pronotum in the former species. However, I have seen an apterous female from Naturhistoriska Riksmuseum, Stockholm which would appear to be the type of *luzonicus* (labeled "Manila" and "Type of *Ptilomera luzonica* K.") and which is very similar to the *borneensis*-type in this respect. From the Field Museum of Natural History, Chicago the author has obtained 3 ♂, 2 ♀ apt. and 1 nymph labeled: "Barungkot, Upi, Cotabato Province, Mindanao, 1500 ft.; :47; CNHM-Philippine Zool. Exped. (1946—47), F. G. Werner leg; stream through original forest", and determined "*Rheumatogonus luzonicus* ? Kirk." by H. B. Hungerford which agree perfectly with the *luzonicus*-type. A comparison of the types and the other specimens of the two species discussed discloses only minute differences. *Rh. luzonicus* is a somewhat bigger form (see table 1.) with larger and more conspicous dark markings, a thicker pubescence on pleura, venter, and abdominal tergites especially in female, but with connexival corners not obscured by hairs. Hind femur of female in all specimens with dilatation like the *borne-*



Figs. 12—14 and 16—17. *Rheumatogonus borneensis* Esaki. — Figs. 12—13 Apterous female (left) and male (right) from Palawan. Fig. 14. Left clasper in male from Calamianes Isl. Figs. 16—17. Basal one third of hind femur in female, dorsal view (fig. 16, female from Palawan, fig. 17, type female from N. Borneo). Fig. 15. *Rh. luzonicus* (Kirk.). Left clasper in male from Mindanao.

ensis-type (fig. 17). The claspers in male (fig. 15) stronger, with a relatively short and broad blade. The phallus-structure, which is relatively simple, is practically identical in the two forms.

Table 1. Table of comparison between *Rh. borneensis* Esaki and *luzonicus* (Kirk.); actual measurements in mm.

	borneensis	*luzonicus*
Body length (notum + tergite 1—7)	♂ 3.10—3.38 ♀ 4.40—4.93	3.68—3.73 5.23—5.85
Head width	♂ 0.86—0.91 ♀ 1.08—1.18	0.99—1.01 1.20—1.29
Width across meso-acetabula	♂ 1.05—1.11 ♀ 1.60—1.79	1.29—1.35 1.91—2.18
Distribution	N. Borneo, Philippines (Palawan, Calamianes Isl.)	Philippines (Luzon, Mindanao)

Whether these two forms deserve specific rank or whether they are allopatric subspecies is difficult to say without breeding experiments. In fact the only clear-cut differences, though small, lie in the body proportions and in the structure of the claspers in the male, while the *borneensis*-females from Palawan and Calamianes are different from the N. Bornean female in the structure of the hind femur.

Family **VELIIDAE** Amyot & Serville, 1843.

Subfamily **Rhagoveliinae** China & Usinger, 1949.

Upto now no species of the genus *Rhagovelia* Mayr have been reported from the Island of Palawan, though 14 species, representing both the recognized subgenera, have been described from other islands of the Philippine archipelago, chiefly Luzon and Mindanao.

Rhagovelia (s. str.) ?hoberlandti Hungerford & Matsuda, 1961. (Fig. 18).

PALAWAN: Mantalingajan, Pinigisan, 600 m., 14 Sept. 1961; (small, shallow puddle fed by a spring). 1 ♀ macr.

Rh. hoberlandti was described from Dimaniang, Busuanga Island in the Calamianes Group just north of Palawan (Hungerford

& Matsuda 1961, p. 260), but only on apterous specimens. In the absence of males, I refer (with some doubt) to this species one macropterous female caught together with two other macropterous females of an unidentified species (see below).

Notes on macropterous female: Compared with an apterous female paratype of *hoberlandti* there are similarities in most characters, including relative measurements of antennal and leg segments. Pronotum blackish; anterior one seventh with a yellowish white transversal band only very slightly interrupted in middle and reaching propleura laterally; rear margin of pronotum brownish. Forewings blackish brown with darker veins and a longitudinal whitish band basally. Venter matt and blackish except 7th sternite, which is yellowish brown and shiny.

Hind femur (fig. 18) armed with several teeth and one spine, while a female paratype of *hoberlandti* has two curved spines on hind femur (fig. 19). However, this and other deviations may be due to geographic or individual variation.

Total length 3.80 mm.; width of head 0.80 mm.; width across humeri of pronotum 1.50 mm.

Rhagovelia (s. str.) sp. nov.? (Fig. 20).

PALAWAN: Mantalingajan, Pinigisan, 600 m., 14 Sept. 1961. 2 ♀ macr., (same locality as above).

This species is rather closely related to *Rh. hoberlandti,* but shows several dissimilarities compared with an apterous paratype of the latter and with the macropterous female just described. In the absence of both apterous females and male specimens I hesitate to name this species as new, and must limit myself to giving a short description of the specimens concerned.

Descriptive notes on macropterous female: Colour: Head and pronotum yellowish brown. Pronotum anteriorly with a dark orange transversal band which does not reach the yellowish brown propleura; disc of pronotum with numerous brownish punctures. Forewings blackish brown with a whitish longitudinal band basally, greatly surpassing tip of pronotum; veins darker and membrane dark greyish. Venter yellowish brown, matt; 7th sternite brownish yellow and shiny. Colour of the appendages as in *hoberlandti.*

Structure: Relative lengths of antennal and leg segments almost the same as in *hoberlandti.* Greatest width of interocular

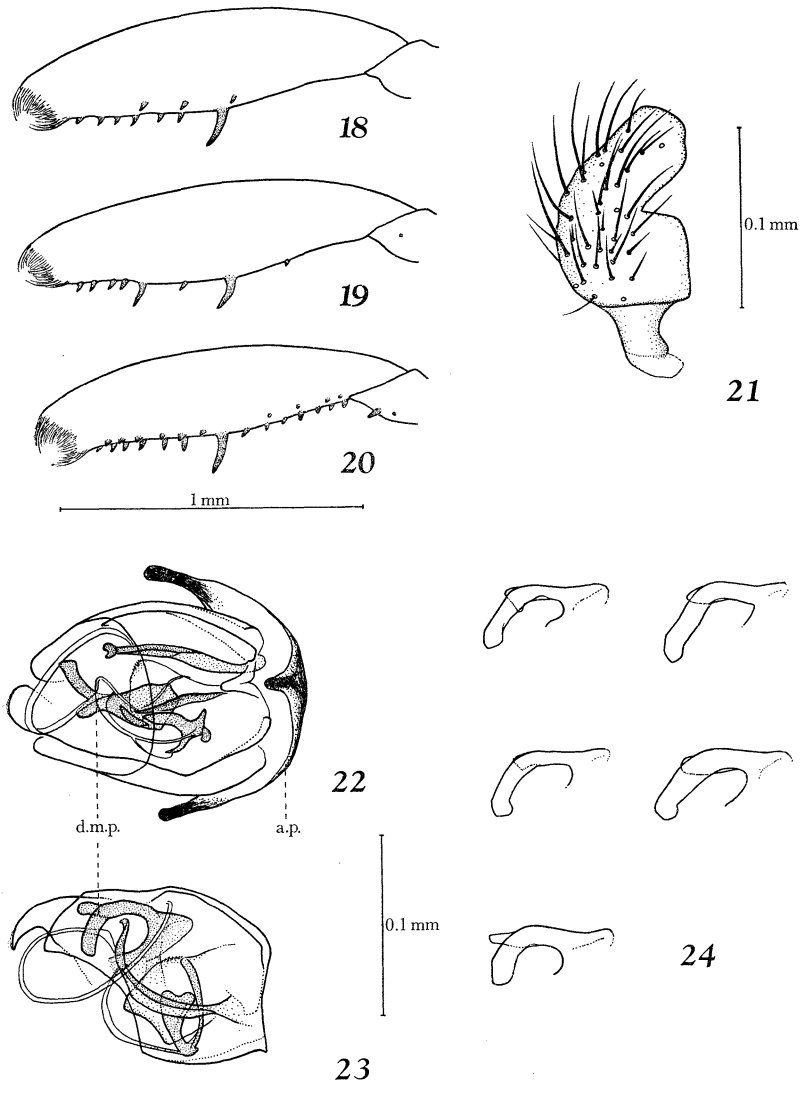
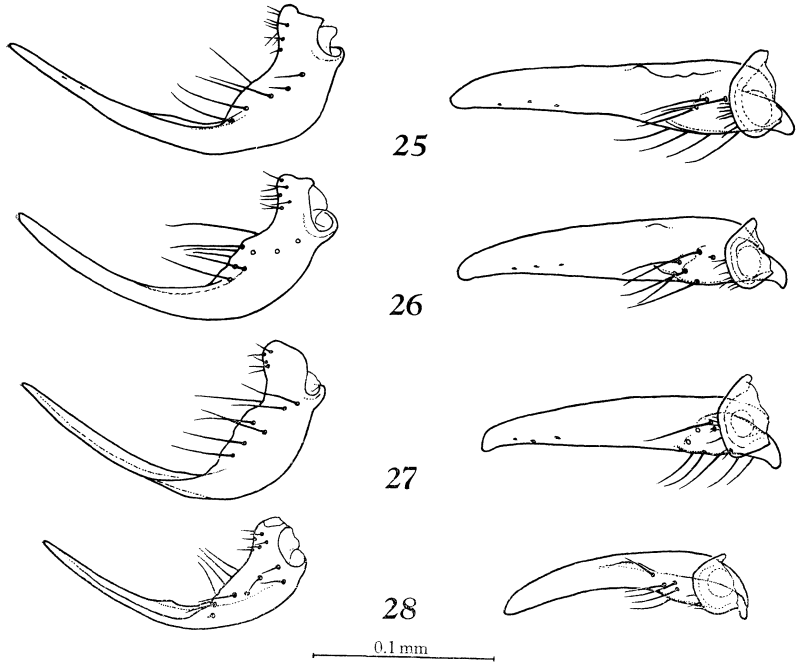
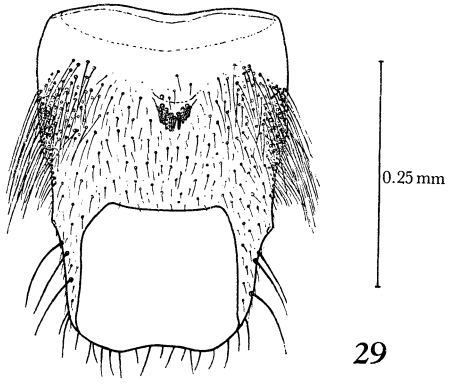


Fig. 18. *Rhagovelia (s. str.) ?hoberlandti* Hung. & Mats., macropterous female from Palawan; right hind femur in ventral view, pubescence omitted. Fig. 19. do. in *Rh. (s. str.) hoberlandti* Hung. & Mats., apterous female paratype from Calamianes Isl. Fig. 20. do. in *Rh. (s. str.) sp. nov.* ?, macr. female from Palawan. Fig. 21. *Rh. (Neorhagovelia) minutissima* Hung. & Mats. Right clasper in apterous male from Palawan. Figs. 22—24. *Microvelia (s. str.) douglasi* Scott. — Fig. 22. Phallus in the resting position (ventral view) showing the various endosomal sclerites (diagrammized). Fig. 23. Phallus in lateral view, articulatory plate omitted. Fig. 24. The variation of the dorso-median plate, lateral view. *a. p.* articulatory plate, *d. m. p.* dorso-median plate.





Figs. 25—28. *Microvelia (s. str.) douglasi* Scott. Variation of the right clasper in male; left, lateral view, right, dorsal view. Figs. 25—27 from Sulu Isl., fig. 28 from Palawan. Fig. 29. *Mesovelia vittigera* Horv., macropterous male from Nigeria. 8th abdominal segment, seen from below.

space slightly greater than in *hoberlandti* apterous paratype and macropterous ?*hoberlandti* female; in relation to the total width of head 0.32 (mean):1, 0.25:1, and 0.25:1 respectively. The armature of hind femur and trochanter as shown on fig. 20, presents several peculiarities compared with *hoberlandti* paratype (fig.19) and ?*hoberlandti* female (fig. 18); e.g., the trochanter is armed with one conspicuous- and one smaller tooth and basal half of femur has several smaller teeth in two rows. Size: Total length 3.73—3.75 mm.; width of head 0.74—0.76 mm.; width across humeri 1.44—1.50 mm.

Macropterous individuals in *Rhagovelia* have as a rule fewer and shorter spines and teeth on the posterior margin of hind femur compared with apterous individuals. For this reason these specimens cannot belong to *hoberlandti* with its much weaker armature in the wingless form; further, in the latter species the anterior transversal band of pronotum reaches the propleura, while this is not so in the specimens under examination.

Rhagovelia (Neorhagovelia) minutissima Hungerford & Matsuda, 1961. (Fig. 21).

PALAWAN: Brooke's Point, Makagwa, 22 Aug. 1961; (small, fast-running river through párang-landscape). 1 ♂, 2 ♀ apt. and 5 nymphs.

Described from Busuanga Island (Calamianes Group) (Hungerford & Matsuda 1961, p. 267). This species is one of the smallest hitherto described in the genus. As the clasper of the male was not figured in the original description (owing to an accident with the single male type) the author here gives a figure (fig. 21) of the right clasper of the male from Palawan. Its shape is quite different from those of the other two Philippine species of the subgenus *Neorhagovelia* (Hungerford & Matsuda l.c., p. 277).

Subfamily **Hydroessinae** Fieber, 1860.
(Microveliinae China & Usinger, 1949.)

Microvelia (s. str.) douglasi Scott, 1874. (Figs. 22—28).
(For synonymy see Lundblad 1933, p. 347 and Miyamoto & Lee 1963, p. 35).

PALAWAN: Brooke's Point, Uring Uring, 17—23 Aug. 1961. 4 ♂, 4 ♀ macr. — TAWI TAWI: Tarawakan, 21 Oct.—15 Nov. 1961. 19 ♂, 37 ♀ macr.; Lapid Lapid, 19 Nov. 1961, 2 ♂, 2 ♀ macr.

All specimens caught by either Mercury or Petromax light between 18.30 and 03.00.

Notes on variation: Lundblad (l.c., p. 347—357) paid great attention to the geographic variation of this widespread species, examining specimens from Japan (type locality), India, Samoa, and Sumatra. He found, in particular, a considerable variation in the shape of the right clasper in male and in the proportional length and width of abdomen.

The numerous specimens from Tawi Tawi offer an opportunity for some notes on the individual variation in one small area in order to establish a better foundation for evaluating the meaning of the geographic variation. Only the variability of diagnostic features such as the total length, the proportional length and width of abdomen, and the genital apparatus in the male are treated here. All examinations and measurements are made on 10 macropterous individuals from Tarawakan, Tawi Tawi and comparisons are made with specimens from Brooke's Point, Palawan.

Size: The total length (from tip of head to tip of wings) in the male ranges from 1.48 to 1.60 mm. (mean 1.53 mm., S.D. 0.04 mm.) and in the female from 1.58 to 1.74 mm. (mean 1.67 mm., S.D. 0.05 mm.). In the Palawanese specimens the corresponding figures are: 4 ♂; 1.39—1.53 mm. (mean 1.45 mm., S.D. 0.06 mm.), 6 ♀; 1.55—1.98 mm. (mean 1.76 mm., S.D. 0.16 mm.). The comparatively high figures for the Palawanese females are caused by two significantly larger specimens (1.88 and 1.98 mm.) which, however, do not appear to be separated in other ways from the bulk of the material.

Abdomen in male: The ratio between the greatest width and the length of abdomen in males, as expressed in per cent, ranges from 72 to 81 (mean 76%, S.D. 2.7 %). Similar figures were obtained for the specimens from Palawan. These measurements were made on individuals cleared in KOH and mounted flat under a coverglass with the tergites and paratergites detached from the rest of the specimen.

Genital apparatus: Characteristic of the group of *Microvelia*-species (*pygmaea*-group) to which *M. douglasi* belongs is the strongly asymmetrical genital apparatus in the male. The large, right, falciform clasper (figs. 25—28) has a proximal thickened shaft with numerous short bristles on the posteriorly

directed margin of the base and several long bristles on the dorsal surface before the beginning of the b l a d e. To obtain standardized visual angles of the clasper it was first placed under a coverglass in a drop of clover oil with lateral surface up, then kept between the edges of two pieces of coverglass in dorsal view with base and tip in focus. As shown in the figures the general shape of the clasper does not vary much and none of the aberrant types figured by Lundblad (l.c.) was found. The blade is usually flat and somewhat twisted in relation to the shaft, and the degree of rotation may vary considerably (from an inward slope in figs. 25 and 26 to the right-angled position in figs. 27 and 28). The clasper in fig. 28 is drawn from a Palawanese specimen and is distinguished by the considerably smaller size, though the individual itself is of approximately the same length as the specimens shown in the other figures. However, this must be an individual departure because another male from the same locality has a normal-sized right clasper.

The phallus of a male cleared in KOH is figured in fig. 22 showing the resting position in the genital capsule. It is strongly asymmetrical, as is the rest of the genital apparatus, and is composed of a basal articulatory plate (*a. p.* in the figure), an outer, proximal tube (phallotheca), and an inner or distal part (endosoma) with a complex structure of sclerotized plates. Owing to the ill-defined limits of the plates it is somewhat difficult to make use of them taxonomically, but at least three plates can be adequately distinguished, as shown in figs. 22 and 23. The most characteristic is the plate arbitrarily designated dorso-median plate (*d.m.p.*). The variation of this sclerite is shown in fig. 24. The phallus-structure has not been used formerly in the taxonomy of *Microvelia,* but it may have some value in case of species with small and inconspicuous claspers.

Distribution (compiled from Lundblad 1933, pp. 357 and 476, Esaki & Miyamoto 1955, p. 185, Miyamoto 1964a. & b., and Fernando 1961, p. 20): Japan (Honshu, Shikoku, Kyushu), Ryukyu Islands, Taiwan (Formosa proper, Kashoto, Kotosho), Philippines (Palawan, Sulu Islands; new records), India, Ceylon, ?Seychelles, Malaya, Indonesia (Sumatra, Java*, Bali*), Guam, and Samoa Islands.

*) These two distributional records in Lundblad (l. c., pp. 357 and 476) are overlooked by Esaki & Miyamoto in their revision of the Japanese *Microvelia* (l.c., p. 185).

Family **MESOVELIIDAE** Douglas & Scott, 1867.

Mesovelia vittigera Horváth, 1895. (Fig. 29).

Mesovelia vittigera Horváth, 1895, p. 160 (Egypt); Horváth, 1915, pp. 544 and 550; Bergroth, 1918, p. 121 (Luzon: Mt. Maquiling); Horváth, 1924, p. 135; Horváth, 1929, p. 6—7 (full synonymy); Jaczewski, 1936, p. 193—196; Brown, 1951, p. 238; Poisson, 1958, p. 213 (as subspecies).

Mesovelia orientalis Kirkaldy, 1901, p. 808 (Sumatra); Horváth, 1924, p. 135—136; Horváth, 1929, p. 6 (synonymy); Lundblad, 1933, p. 186—190; Usinger, 1946, p. 92—93 (Guam and Luzon: Montalban); Miyamoto & Lee, 1963, p. 34.

Mesovelia proxima Schouteden & Bergroth, 1905, p. 388 (Congo).

Mesovelia vittigera orientalis Poisson, 1958, p. 213.

PALAWAN: Brooke's Point, Uring Uring, 14 Aug. 1961; caught by Mercury light 19.00—21.00. 1 ♂, 4 ♀ macr.

Since Horváth (1895) described his *M. vittigera* from Egypt and Kirkaldy (1901) his *M. orientalis* from Sumatra there has been some dispute about the taxonomic position of these two very similar forms.

Some authors, such as Jaczewski (1936) and Brown (1951) follow Horváth's point of view in his monograph of the Mesoveliidae (1915) where he reduced *orientalis* to synonymical rank under *vittigera,* while Lundblad (1933) and others agree with Horváth in his later opinion (1924) that the two forms are specifically distinct.

At a later date, Poisson (1958) referring to Jaczewski (1936) and personal investigations of *vittigera*-specimens came to the conclusion that the oriental and ethiopian "form" are two subspecies of one widely distributed species, *M. vittigera* Horv., which only differ in having more hairs in the lateral hair-tufts of 8th abdominal segment in *vittigera orientalis* male specimens.

In order to test this statement the author has compared series of macropterous specimens from Anatolia (Turkey), Upper Volta, Ibadan (Nigeria), Palawan (Philippines), and Shanghai (China), and is unable to find any significant morphological differences at all. The average body length and the colour-markings are approximately the same. Moreover, this and other species of the genus are known to vary extensively in regard to these characters within the same area (e.g. Brown l.c., p. 238). Concerning the development of the lateral hair-tufts on the 8th abdominal segment in the male the specimens from Turkey and Africa do not show any

differences compared with the oriental specimens (Fig. 29 and compare with Lundblad l.c., fig. 70).

The number of spines on the ventral surface of the femora seems to be variable even within the same population, as is the shape of the claspers in male as pointed out by Usinger (1946). The structure of the phallus, which has also been compared, is in the author's opinion too simple to offer any taxonomical clues. Finally, Neering (1954) in a distributional study of the variation in the common American *M. mulsanti* White shows that the morphological variation of the apical abdominal segments in both sexes and the claspers of the male, is individual, and not correlated with definite distributional patterns, and that the previously separated subspecies based on these characters are invalid. On these grounds, therefore, it would appear appropriate to regard the oriental and ethiopian "forms" of *M. vittigera* as belonging to the same widely distributed monotypic species — at least until a study of the variation based on a large material from the whole distributional area has been undertaken, and has shown a taxonomically significant geographic variation which would justify a subspecific segregation.

Distribution (compiled from Miyamoto 1964b., Miyamoto & Lee 1963, Fernando 1961, and Brown 1951): Japan (Shikoku, Kyushu), Ryukyu Islands, Taiwan, China (Shanghai; new record), Philippines (Luzon, Palawan; new record), India, Ceylon, Malaya, Indonesia (Sumatra, Java, Lombok), N. Guinea, Guam. — Ethiopian Region, Madagascar, Comores, Mediterranean Europe, and the Middle East.

Acknowledgments.

I am indebted to Dr. George W. Byers, University of Kansas, Lawrence, Dr. P. Viette of Museum National d'Histoire Naturelle, Paris, Mr. Per Inge Persson of Naturhistoriska Riksmuseum, Stockholm, and to Dr. Rupert L. Wenzel of the Field Museum of Natural History, Chicago for the loan of types or other specimens of species discussed in this paper, and finally to Dr. L. Hoberlandt of Národní Muzeum, Prague for the gift of specimens of *Mesovelia vittigera* Horv. from Turkey and Upper Volta.

Summary.

12 species of semiaquatic Hemiptera are recorded from the Philippine Islands, 3 of which are new to the islands and one new to science, *Ptilomera (s. str.) hungerfordi* sp. nov. *Rheumatogonus borneensis* Esaki is redescribed and compared with *Rh. luzonicus* (Kirk.). The individual variation of *Microvelia douglasi* Scott is described and the taxonomic position of *Mesovelia vittigera* Horv. and *orientalis* Kirk. is discussed. The first records of the genus *Rhagovelia* from the island Palawan are given. Full distributional data are compiled for most of the species.

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Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 51.)

Contribution à la connaissance des Celyphidae (Diptera) des Philippines et du Sud-Est asiatique.

Par
P. Vanschuytbroeck (Bruxelles).

Parmi le matériel qui m'a été communiqué par M. le Dr Leif Lyneborg, de l'Université de Copenhague, j'ai pu reconnaître, outre des formes déjà décrites, deux espèces nouvelles pour la Science, dont la description fait l'objet du présent travail.

Le travail comporte deux parties: la détermination de la collection générale du matériel Celyphidae du Museum Zoologique de Copenhague et les récoltes ramenée par la Noona Dan Expedition aux Philippines (Petersen, 1966, Ent. Meddr. vol. 34, pp. 283—304).

Le matériel des Philippines comporte sept espèces en trois genres: *Celyphus bisetosus* Malloch; *Acelyphus repletus* Malloch, *A. lyneborgi* n. sp. et *A. stigmaticus* Hendel; *Spaniocelyphus nigrocoeruleus* Malloch, *S. laevis* van der Wulp et *S. palawanensis* n. sp.

La collection générale comportait les espèces suivantes: *Celyphus difficilis* Malloch, *C. obtectus* Dalman, *C. punctipes* Malloch, *C. aurora* Karsh; *Spaniocelyphus scutatus* Wiedemann, *S. trigonalis* de Meijere et *laevis* van der Wulp.

Genre **Celyphus** Dalman.

Celyphus Dalman, 1823, Anal. Entomol., p. 32, pl. II, B, fig. 1—5.

Une nervure transverse bien nette séparant la cellule discale et la cellule basale postérieure de l'aile.

Arista fortement écartée de la ligne médiane à la base et en forme de feuille; scutellum hémisphérique; occiput arrondi; soies postverticales manquantes ou réduites.

Table des espèces.

1. Pattes noires; fémurs postérieurs, sauf à l'extrême apex, fémurs antérieurs et médians, sauf le 1/5 apical et tous les tarses rougeâtres ..... *eos* Frey.
— Pattes non noires; petites espèces ..... 2.
2. Une soie postverticale; thorax brun-jaune; scutellum lisse, violet métallique ..... *bisetosus* Malloch.
— Deux soies postverticales ..... 3.
3. Partie inférieure de la face portant une tache noire entre l'orbite et la base de l'antenne ..... 4.
— Pas de tache noire à la partie inférieure de la face ..... 5.
4. Thorax et scutellum brun-jaune, à reflet violet; soie apicale de l'arista plus courte que la partie basale de l'arista; celle-ci élargie en forme de feuille ..... *puncticeps* Malloch.
— Thorax brun-jaune; scutellum bleu métallique; soie apicale de l'arista presque aussi longue que la partie élargie de l'arista ..... *aurora* Karsch.
5. Scutellum lisse ou rugueux seulement à la base ..... 6.
— Scutellum plus ou moins rugueux jusqu'à l'apex, avec une ligne médiane plus ou moins lisse ..... 9.
6. Scutellum presque entièrement lisse ..... 7.
— Scutellum entièrement lisse ..... 8.
7. Scutellum violet; abdomen violet; tous les tarses jaunes ..... *strigatus* Vanschuytbroeck
— Scutellum avec taches brunes, le restant jaune; abdomen noir brillant; tarses antérieurs bruns, les postérieurs jaunes; arista très fine à l'apex ..... *punctifer* Hendel
8. Scutellum rouge-jaune avec reflet violet seulement dans sa partie antérieure; mésonotum brillant, rouge-jaune, sans tache; tête, antennes, abdomen et pattes orange ..... *lucidus* Karsch.
— Scutellum sans reflet violet; mésonotum violet; pattes antérieures et médianes jaune clair; les postérieures brun-noir ..... *ceylanensis* Vanschuytbroeck.
9. Scutellum entièrement ou tout au moins en grande partie jaune clair ou brun clair ..... 10.
— Scutellum habituellement bleu métallique; partie apicale filiforme de l'arista toujours visiblement plus courte que la partie élargie ..... *obtectus* Dalman.
10. Partie apicale filiforme de l'arista des 2/3 de la partie élargie ..... *coei* Vanschuytbroeck.
— Partie apicale filiforme de l'arista aussi longue que la partie élargie ..... 11.
11. Thorax et scutellum entièrement jaune clair; partie inférieure de la face jaune sans tache ..... *difficilis* Malloch.
— Thorax noir, bordé de rouge ..... 12.
12. Scutellum entièrement brun clair; partie inférieure de la face et de l'orbite avec une bande brune; palpes noirs à l'apex ..... *discoideus* Frey.
— Scutellum avec tache foncée à la base ..... *signatus* Karsch.

Celyphus aurora Karsh.

C. aurora Karsch, 1883, Berl. Ent. Zeitschr., vol. 28, p. 173.

Espèce testacée, avec un reflet bleu métallique sur la face et le front, la partie supérieure du thorax et du scutellum. Une tache noire de chaque côté de la face entre les antennes et les yeux. L'arista est large et la portion sétifère aussi longue que l'antenne. Le front est arrondi au bord postérieur et porte quatre soies verticales. L'abdomen est brun clair.

JAVA: 10 exemplaires (Mus. Hauschild).

Celyphus punctipes Malloch.

C. punctipes Malloch, 1929, Proc. U.S. Nat. Mus., vol. 74, art. 6, p. 8.

Testacée jaune avec une bande bleu-violacée sur la partie dorsale; deux taches noires de chaque côté entre l'antenne et l'oeil; espèce très semblable à *obtectus* Wied., mais l'arista plus proche à la base; scutellum rugueux surtout à la base.

SIAM: Prae, 7 exs. 1929—33 (Paul Fogh, Coll. Rosenberg). — SUMATRA: Tjadi, 1 ex., 20. IV. 1880 (Klein).

Celyphus obtectus Dalm.

C. obtectus Dalman, 1823, Anal. Entomol., p. 32.

Scutellum plus ou moins sphérique, un peu moins long que large, mais beaucoup plus large que le thorax; face sans tache noire; arista épaissie au-delà du milieu et à pilosité plus courte sur les bords que chez *aurora* Karsch.

SUMATRA: 9 exs. (Klein). — JAVA: 1 ex. (Mus. Hauschild); Batavia, 2 exs. (Mus. Westermann).

Celyphus difficilis Malloch.

C. difficilis Malloch, 1927, Ent. Mitt., vol. 16, p. 161.

De teinte uniformément jaune sans tache ou reflet violet du thorax; Abdomen élargi et dépassant les bords du scutellum; face portant une tache violacée sous les yeux.

ILES ANDAMANS: 11 exs. (Roepstorff). — JAVA: Batavia, 1 ex. (Mus. Westermann).

Celyphus bisetosus Malloch.

C. bisetosus Malloch, 1929, Proc. U.S. Nat. Mus., vol. 74, art. 6, pp.8-9.

De teinte générale testacée jaune avec un reflet violet; scutellum

bleu-violet métallique; abdomen brun foncé sur les tergites et jaune sur les sternites; antennes brunâtres; ailes jaunes; segment basal de l'antenne deux fois plus long que le segment suivant.

Philippines. — PALAWAN: Mantalingajan, Pinigisan Barrio, 500 m., 1 ex., 7. IX. 1961 (Noona Dan Exp.).

Genre **Spaniocelyphus** Hendel.

Spaniocelyphus Hendel, 1914, Suppl. Entomol., III p. 92.

Vertex à bord aigu, sans soie postverticale bien développée. Cellule discale et cellule basale postérieure de l'aile, séparées par une nervure transverse bien distincte. Palpes bien moins élargis à l'apex que dans le genre *Acelyphus*. Front plus court également que chez *Celyphus*. Abdomen étroit, avec bandes latérales bien marquées. Premier article des antennes plus court que le troisième. Scutellum ovale, plus long que large, un peu plus large que le thorax. Arista élargie en forme de feuille. Pas de soie scutellaire. Fémurs postérieurs sans épine apicale courbée, mais portant une petite soie apicale.

Liste des *Spaniocelyphus*.

Pamalae Stuckenberg (Mozambique); *umsinduzi* Stuckenberg (Natal); *bigoti* Karsch (Indes); *janthinus* Vanschuytbroeck (Indes); *nepalensis* Vanschuytbroeck (Nepal); *chinensis* Jacobson (Chine); *hangchowensis* Yoshioôuchi (Chine E.); *formosanus* Malloch (Formose); *scutatus* Wiedemann (Formose, Java); *palmi* Frey (Sumatra); *sumatranus* Malloch = *trigonalis* de Meijere (Sumatra); *nigrifacies* de Meijere (Java); *laevis* van der Wulp (Philippines); *nigrocoerulus* Malloch (Philippines); *palawanensis* n. sp. (Philippines) et *philippinus* Frey (Philippines).

Spaniocelyphus trigonalis de Meijere.

S. trigonalis de Meijere, 1915, Tijdschr. v. Entom., vol. 58.

Bord antérieur du thorax et l'humérus fauve; scutellum bleu métallique; abdomen noir avec anneaux bruns; scutellum rugueux dans sa partie antérieure; antennes plus courtes que la longueur du front; partie plumeuse de l'antenne aussi longue que le troisième article des antennes; transverse postérieure de l'aile complète.

SUMATRA: 3 exemplaires (Klein).

Spaniocelyphus scutatus Wiedemann.

S. scutatus Wiedemann, 1830, Aussereur. Zweifl., vol. 2, p. 601.

Scutellum bleu cuivré; pattes jaune-brun avec anneaux brun noir; vertex aigu; pas de soies verticales bien développées; cellule basale séparée par une transverse complète.

INDES: Tranquebar, 1 exemplaire (Mus. Westermann).

Spaniocelyphus laevis van der Wulp.

S. laevis van der Wulp, 1881, Tijdschr. v. Entom., vol. 22, p. 53.

Scutellum entièrement lisse et brillant, bleu noir; front et partie inférieure de la face brun rouge avec reflet bleu; espèce très proche de *scutatus,* mais différeant principalement par le mesonotum et le scutellum moins punctués.

SUMATRA: 1 exemplaire (Mus. Westermann).

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m., 2 exs. 6. et 23. IX. 1961; Pinigisan Barrio, 500 m., 1 ex., 2. IX. 1961. — BALABAC: Dalawan Bay, 1 ex., 12. X. 1961. (Noona Dan Exp.).

Spaniocelyphus nigrocoerulus Malloch.

S. nigrocoerulus Malloch, 1929, Proc. U.S. Nat. Mus., vol. 74, art. 6, pp. 11—12.

Face et front complètement bleu métallique; thorax bleu métallique foncé, sauf une petite bande antérieure; abdomen brun noir; pattes jaune brun; soies verticales très courtes; arista plumeuse dans la partie terminale et cette partie moitié de la longueur de la partie basale.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m., 1 ex., 12. IX. 1961 (Noona Dan Exp.).

Spaniocelyphus palawanensis n. sp. (fig. 1).

Espèce voisine des *S. nigrocoerulus* Malloch et *S. laevis* van der Wulp, ayant le thorax entièrement métallisé, violet; le scutellum entièrement à petites dépressions, moins fortement marquées à l'apex; le front et la face sans trace foncée.

Face et front testacées; front brillant; les rebords frontaux plus clairs le long des yeux; rebord buccal jaune brun; antennes à segments un et deux jaune brun à fine pilosité; troisième segment de l'antenne plus fortement rembruni, avec une encoche préapicale sur le bord postérieur pour l'insertion de l'arista; celle-ci lancéolée, plus longue (y compris la partie plumeuse) que les trois articles

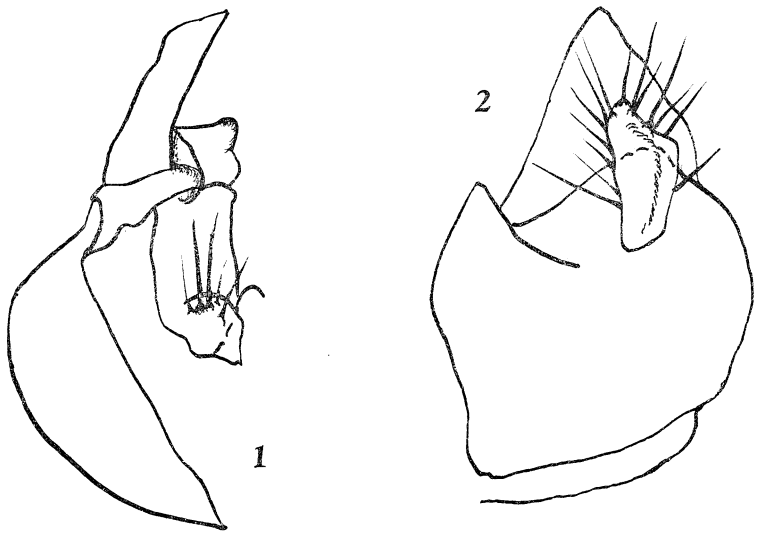

Fig. 1. *Spaniocelyphus palawanensis* n. sp. Lamell. hypopyg. ext. (× 55 env.). — Fig. 2. *Acelyphus lyneborgi* n. sp. Lamell. hypopyg. ext. (× 40 env.)

de l'antenne réunis; partie plumeuse de l'arista de longueur égale au tiers de l'arista; tubercule ocellaire noir, brillant; occiput brun noir. Mesonotum violacé, brillant; scutellum portant sur toute sa surface, un réseau de petites dépressions uniformément réparties; humérus proéminent, violet, brillant; scutellum une fois et demi aussi large, recouvrant l'abdomen, sauf sur la partie postérieure, peu courbé à l'apex.

Hanches et pattes foncièrement brunes; fémurs antérieurs avec une série postéro-latérales de quatre longues et deux courtes soies; tibias antérieurs portant une longue soie antéro-médiane; métatarses antérieurs aussi longs que les quatre articles suivants réunis.

Ailes jaunes; nervures longitudinales trois et quatre presque parallèles, courbées vers l'avant à l'apex; nervure sous-costale s'étendant plus loin que la moitié de la nervure costale; cellules basale et discale séparées par une nervure transversale complète.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, holotype, 22. VIII. 1961 (Malaise trap), 2 paratypes, id., 23. VIII.; Mantalingajan, Pinigisan, 600 m., 1 paratype, 11. IX. 1961 (Malaise trap, inside forest). (Noona Dan Exp.). Holotype et 2 paratypes dans le Musée Zoologique de Copenhague; un paratype dans ma collection.

Genre **Acelyphus** Malloch.

Acelyphus Malloch, 1929, Proc. U.S. Nat. Mus., vol. 74, art. 6, p. 4.

Genre voisin du *Spaniocelyphus* mais se distingue spécialement: par la présence d'une paire de soies verticales postérieures, l'absence une nervure transverse complète entre les cellules basale et discale de l'aile; un abdomen plus large sans strie ou anneau entre les segments; la face présente ou non une tache foncée et le scutellum est généralement granuleux.

Acelyphus lyneborgi n. sp. (fig. 2).

Espèce voisine de *A. nigrocoerulus* Malloch et *stigmaticus* Hendel *(Spaniocelyphus)*; le scutellum entièrement granuleux, élargi antérieurement; le thorax avec humérus proéminent, de teinte brun noir, brillant; les pleures uniformément granuleuses; les transverses alaires marquées entre les cellules basale et discale, ce qui le rapproche du genre *Spaniocelyphus.*

Face testacée, brillante; bord supérieur plus clair que l'inférieur, proéminent, incurvé; praelabrum brun foncé; palpes allongés, noirs. Front lisse, brillant, brun à reflet violet; tubercule ocellaire brun noir; trois paires de soies: postverticales, verticales internes et externes, courbées, courtes; segment médian de l'antenne jaune, les antérieurs et les postérieurs brun foncé; segment basal tronconique plus long que le segment médian; segment terminal aplati, plus long que le médian également et avec courte pilosité; arista aplatie, lancéolée, de longueur égale aux deux et trois réunis, terminée par une soie plumeuse de la longueur des 2/3 de l'arista.

Mesonotum brun foncé, mat, très finement granuleux; calus huméral proéminent, brun clair; pleures uniformément granuleux, brunâtres.

Scutellum ovoïde, plus large antérieurement, fortement arrondi, presque droit à l'apex; bord latéral en gouttière; entièrement granuleux, plus long que large (47 à 29), ne couvrant que les premiers segments abdominaux; de teinte noire violacée.

Balanciers à tige jaunâtre et tête noire.

Pattes généralement jaunâtres; tibias antérieurs avec bandes brunes médianes et apex rembruni, une épine postérieure; fémurs antérieurs avec soies antéro-inférieures et médianes latérales plus longues; derniers segments des tarses foncés; premier article très allongé.

Ailes entièrement jaunies; nervure sous-costale s'étendant jusqu'à

la moitié de la costale; première nervure longitudinale courbée à l'apex vers la costale à mi-distance de R1 et R3; R5 d'abord dirigée vers l'arrière et le bas, faisant un angle avec le sommet de la transverse postérieure.

Abdomen élargi, transversalement, sternites bordés de brun; hypopyge court à lamelles arrondies, jaune à courte pilosité.

Philippines. — BALABAC: Balabac Peak, holotype, 10. X. 1961 (Noona Dan Exp.). Dans le Musée Zoologique de Copenhague.

Acelyphus stigmaticus Hendel.

A. stigmaticus Hendel, 1914, Suppl. Entomol., III p. 93.

Toute la surface du mesonotum et du scutellum recouverte d'une pilosité dense et courte; scutellum une fois et demi aussi long que large; partie inférieure de la face sans tache foncée.

Philippines. — MINDANAO: Curuan District, Sapamoro, 2 exs., 20—21. XII. 1961 (Noona Dan Exp.).

Acelyphus repletus Malloch.

A. repletus Malloch, 1929, Proc. U.S. Nat. Mus., vol. 74, art. 6, p. 5.

Scutellum sans pilosité, une fois et demi aussi long que large; mesonotum portant une pilosité dense et courte; cellule basale et discale séparées par une transverse complète; seconde nervure longitudinale courbée fortement vers l'avant à l'apex.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 2 exs., 18. VIII. et 15. IX. 1961 (Noona Dan Exp.).

Summary.

Thirteen species are recorded from localities in South-East Asia, mainly Sumatra and southern Philippine Islands. Two new species are described (in the genera *Spaniocelyphus* and *Acelyphus)*, both from the Philippines. A key to the genus *Celyphus* is presented.

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(Noona Dan Papers No. 52.)

Some Aradidae (Hemiptera-Heteroptera) from the Philippine, Bismarck and Solomon Islands.

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By the kind offices of Dr. Børge Petersen of the Zoological Museum in Copenhagen, to whom I express my sincere gratitude, I have had a privilege to study Aradidae collected by the Noona Dan Expedition in the years 1961—62 in the Philippines and Bismarck Archipelago (Petersen, 1966).

The relatively small lot of 102 specimens contained representatives of two subfamilies, eight genera, eighteen species and one subspecies, of which four species are new and are described elsewhere in this paper. Besides four new species, of which three belong to the subfamily Carventinae, and one to Mezirinae, one specimen of *Daulocoris auritomentosa* (Kormilev), 1955, represents a particular interest being collected on New Britain I., so far from its original distribution in Indonesia (Borneo).

All measurements indicated in this paper were taken by a micro-millimeter eyepiece, 25 units representing 1 mm. Length of the head, pronotum, scutellum, and abdomen, was taken on median line; for convenience, length of abdomen was taken from the tip of scutellum to the tip of hypopygium, or segment IX in the female, respectively. Postero-exterior angles of connexiva are called PE-angles. In measurements the first figure in ratio represents the length, and the second the width of measured portion.

Subfam. CARVENTINAE Usinger.

This subfamily was represented in the lot by a single macropterous genus *Carventus* Stål, 1865, and four species, of which three are new, and are described here with.

Gen. **Carventus** Stål, 1865.

1. **Carventus biroi** Kormilev.

Carventus biroi Kormilev, 1954, Philipp. Jour. Sc., 83:125.

Bismarck Isls. — MUSSAU: Talumalaus, 1 ♀, 24.I.1962.

Distribution: New Guinea.

2. **Carventus longiventris** n. sp. Figs. 1—2.

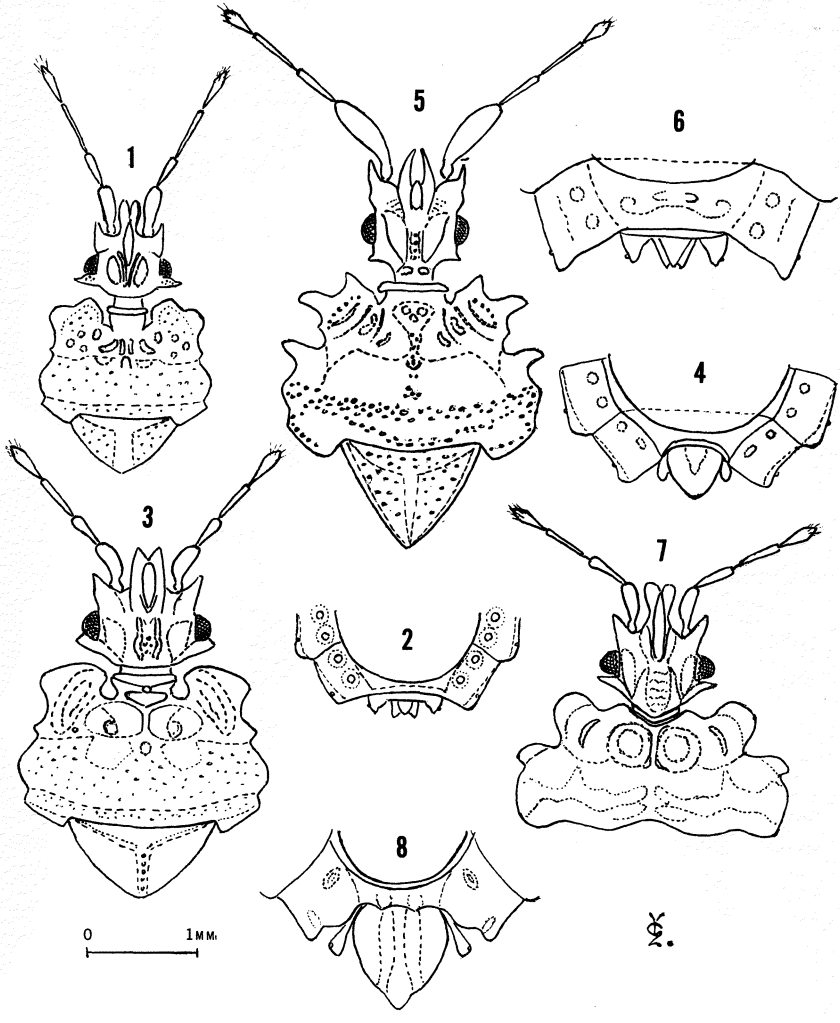
F e m a l e. Elongate ovate, partially covered with a thin layer of whitish incrustation.

Head as long as width across the eyes (21.5:21.5). Anterior process strong, with parallel sides at the base, but tapering apically, apex deeply incised, genae being much longer than clypeus, reaching to 3/4 of antennal segment I. Antenniferous tubercles subparallel, short, acute, with convex exterior borders, reach to 1/4 of ant. segment I. Eyes moderately large, semiglobose. Postocular tubercles acute, produced far beyond outer borders of eyes. Vertex slightly raised medially, and with two (1 + 1) ovate, callous spots mesad of eyes. Antennae slender, twice as long as head (42:21.5); proportions of antennal segments, I to IV, are: 12:7:12:11. Rostrum reaches to hind border of rostral groove, which is closed posteriorly.

Pronotum much shorter than its maximal width across humeri (26:40); fore lobe narrower than hind lobe (36:40). Collar large, long and wide, separated from the disc by deep incisures laterally. Antero-lateral angles form large lobes, rounded anteriorly and produced beyond collar; lateral borders of fore lobe rounded anteriorly, and sinuate posteriorly, terminating with a tooth. Fore disc with a short, median sulcus, flanked by two (1 + 1), short carinae, and more laterad by four (2+2) crescent-shaped callosities. Lateral borders of hind lobe convex in the middle, sinuate anteriorly and posteriorly. Posterior border straight in the middle, angularly produced backward laterad of scutellum. Hind disc with a thin, transverse sulcus along hind border.

Scutellum subtriangular, shorter than width at the base (13:25); lateral borders rounded; apex angularly rounded; disc flat, slightly raised along basal border.

Hemelytra reach slightly over the middle of tergum VII; corium reaches to 1/3 of scutellum. Baso-lateral borders of corium expanded, rounded, and incised behind expansion; membrane large, with a few wrinkles.



Figs. 1—2. *Carventus longiventris* n. sp., ♀. (1) Head, pronotum and scutellum. (2) Apex of abdomen dorsal view.

Figs. 3—4. *Carventus oviventris* n. sp., ♂. (3) Head, pronotum and scutellum. (4) Apex of abdomen dorsal view.

Figs. 5—6. *Carventus peterseni* n. sp., ♀. (5) Head, pronotum and scutellum. (6) Apex of abdomen dorsal view.

Figs. 7—8. *Usingerida parva* n. sp., ♂. (7) Head and pronotum. (8) Apex of abdomen dorsal view.

Abdomen ovate, longer than maximal width across segment V (68:57). Connexivum wide and flat; exterior borders of connexiva slightly convex; PE-angles distinctly protruding; PE-VII forms a right angle, produced as far as paratergites; the latter triangular, slightly shorter than rectangular segment IX. Spiracles II to III ventral, and not visible from above, IV to VIII lateral, or slightly dorso-lateral, and visible from above.

Legs unarmed; trochanters free; arolia present.

Color: yellow brown, but on the dorsal surface partially concealed by whitish incrustation; tibiae, tarsi, rostrum, and antennal segments I to IV at the base, are paler.

Total length 5.16 mm.; width of pronotum 1.60 mm.; width of abdomen 2.28 mm.

Holotype: ♀, Philippines, PALAWAN: Mantalingajan, Tagembung, 1150 m., 20.IX.1961; deposited in the Zoological Museum, Copenhagen.

Paratype: 1 ♀, collected with holotype; in the collection of the author.

Carventus longiventris n. sp. is related to *C. horvathi* Kormilev, 1954, from New Guinea, but is smaller, proportions of antennal segments are different, and spiracles III are ventral.

3. **Carventus oviventris** n. sp. Figs. 3—4.

M a l e. Ovate, partially covered with brownish incrustation. Closely related to *C. robustus* Kormilev, 1966, from Fiji, but much larger; head as long as width across eyes; anterior process reaching (♂), or almost reaching (♀), to tip of antennal segment I; antennal segment III relatively longer, almost as long as I. Sculpture of pronotum less protruding. In other characters is similar to *C. robustus.*

Measurements: head as long as width across eyes (♂-27.5:27.5, ♀-30:30), but shorter than width across postocular tubercles (♂-27.5:30), ♀-30:32). Proportions of antennal segments, I to IV, are ♂-12:8:11:10, ♀-14:9:12.5:10. Pronotum much shorter than maximal width (♂-33:57, ♀-36:64), fore lobe narrower than hind lobe (♂-47:57, ♀-52:64). Scutellum shorter than width at the base (♂-16:34, ♀-19:35). Abdomen longer than maximal width across segment IV (♂-81:72.5, ♀-100:94). Spiracles II ventral, and not visible from above; III to VIII lateral and visible. PE-angles distinctly protruding, blunt; PE-VII form a right angle, in the

male they are slightly produced beyond tip of paratergites; in the female they do not reach to these tips. Hypopygium subcordate, raised medially on the fore half; segment IX in the female trapezoidal, incised at the tip. Paratergites (♂) reach to 3/5 of hypopygium; in the female, reach to 2/3 of segment IX.

Color: brown; round callous spots on connexivum, antennae, rostrum, and legs, are lighter, yellow brown.

Total length: ♂-6.50, ♀-7.40 mm.; width of pronotum: ♂-2.28, ♀-2.56 mm.; width of abdomen: ♂-2.90, ♀-3.76 mm.

Holotype: ♂, Bismarck Isls., NEW BRITAIN: Yalom, 1000 m., 21.V.1962; deposited in the Zoological Museum, Copenhagen.

Allotype: ♀, collected with holotype; in the same collection. 2 ♀, both without head, collected with holotype.

4. **Carventus peterseni** n. sp. Figs. 5—6.

F e m a l e. Elongate ovate, covered with brownish incrustation, and dirt; lateral borders of pronotum and abdomen with short, pale, spaced bristles, protruding through incrustation.

Related to *Carventus kirkaldyi* China, 1930, from Samoa, of the same size, and shape, but the head is longer than width across eyes; anterior process relatively shorter, reaching only to 2/5 of antennal segment I; antennal segment I relatively longer, one and a half times as long as III; postocular tubercles smaller, do not reach to outer border of eyes, and directed obliquely backward; exterior borders of connexiva less convex; PE-VII produced as acute lobes as far as paratergites, and segment IX. Short, pale bristles on lateral borders of pronotum and abdomen are absent in *C. kirkaldyi* China.

Measurements: head longer than width across eyes (30:26); proportions of antennal segments, I to IV, are: 22:12.5:15:8.5; pronotum much shorter than maximal width (37:60); fore lobe narrower than hind lobe (52:60); scutellum shorter than width at the base (20:33); abdomen longer than maximal width across segment IV (105:90). Spiracles II ventral, and not visible from above, III to VIII lateral and visible.

Color: brown, partially concealed by brownish incrustation.

Total length 7.8 mm.; width of pronotum 2.4 mm.; width of abdomen 3.6 mm.

Holotype: ♀, Bismarck Isls., NEW BRITAIN: Yalom, 1000 m., 21.V.1962; deposited in the Zoological Museum, Copenhagen.

It is a pleasure to dedicate this curious species to Dr. Børge Petersen, by whose kind offices I have had a privilege to study this lot of Aradidae.

Carventus peterseni n. sp. belongs to the group previously separated into a genus *Camerarius* Distant, 1902. I have considered *Camerarius* Distant, and *Burgeonia* Schouteden, 1919, as subgenera of *Carventus* Stål. Usinger and Matsuda synonymized both with *Carventus* (1959:120) motivating, that their distribution do not follow separated geographical areas (*Burgeonia* is Ethiopical, and *Carventus* and *Camerarius* are Oriental and Pacific, with one species of the former Central American), but we surely have three different, though related, groups in *Carventus,* which split just along these three former genera, so maybe it would be better to retain them as subgenera.

Subfam. MEZIRINAE Oshanin.

Gen. **Artabanus** Stål, 1865.

Artabanus is a rather heterogenous genus, but all its species have in common a curious stridulatory apparatus: a knife-like carina on sternum IV, and file-like upper-inner surface of hind tibia as a counter part.

1. **Artabanus sinuatus** Stål.

Artabanus sinuatus Stål, 1873, Enum. Hem., 3:141.
Crimia doreica Walker, 1873, Cat. Hem. Het. Brit. Mus., 7:17.

Bismarck Isls. — NEW BRITAIN: Yalom, 1000 m., 1 ♂, 21.V.1962.

Distribution: New Guinea.

Artabanus sinuatus Stål is identical with *Crimia doreica* Walker, both were published in 1873, but I was unable to find out which name has the priority.

2. **Artabanus bilobiceps** (Lethierry).

Brachyrhynchus bilobiceps Lethierry, 1888, Ann. Mus. Civ. Stor. Nat., Genova; 26:464.
Artabanus atkinsoni Bergroth, 1889, Ann. Mus. Civ. Stor. Nat., Genova; 27:734.
Artabanus bilobiceps Bergroth, 1892, Ann. Mus. Civ. Stor. Nat., Genova; 31:715.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 1 ♀, 6.IX.1961. — BALABAC: Dalawan Bay, 1 ♀, 12.X.1961.

Distribution: Indonesia, Philippines.

2a. **Artabanus bilobiceps papuasicus** Kormilev (in press).

Solomon Isls. — GUADALCANAL: 17 km W. of Honiara, Rain Forest, 1 ♂, 28-29.VII.1962.

Distribution: New Guinea (Papua).

Gen. **Glochocoris** Usinger and Matsuda, 1959.

1. **Glochocoris biroi** Kormilev.

Glochocoris biroi Kormilev, 1960, Quart. Jour. Taiwan Mus., 13:170.

Bismarck Isls. — DYAUL: Sumuna, 1 ♂, 3 nymphs, 11.III.1962.

Distribution: New Guinea.

Gen. **Neuroctenus** Fieber, 1861.

1. **Neuroctenus antennatus** Banks.

Neuroctenus antennatus Banks, 1909, Philipp. Jour. Sc., 4:582.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m., 1 ♂, 19.IX.1961. — TAWI TAWI: Tarawakan, 1 ♀, 7.XI.1961.

Distribution: Philippines.

2. **Neuroctenus mayri** Stål.

Neuroctenus mayri Stål, 1870, öfv. Vet. Ak. Förh., 27:674.

Philippines. — PALAWAN: Brooke's Point, Uring Uring, 1 ♂, 1 ♀, 20. and 25.VIII.1961. — MINDANAO: Sapamoro, Curuan Distr., 1 ♀, 19.XII.1961.

Distribution: Philippines, Borneo.

3. **Neuroctenus vicinus** Signoret.

Neuroctenus vicinus Signoret, 1880, Ann. Mus. Civ. Stor. Nat., Genova, 15:542.

Bismarck Isls. — DUKE OF YORK: Manuan, 1 ♀, 20.VII.1962.

Distribution: New Guinea, New Ireland, North Australia (?).

Gen. **Usingerida** Kormilev, 1955.

Species belonging to this genus previously were attributed to the genus *Mezira* A.S., 1843. Distribution of this genus is from Russian Far East (Amur), and Ceylon, to New Guinea.

1. **Usingerida parva** n. sp. Figs. 7—8.

M a l e. Closely related to *Usingerida walshi* Kormilev, 1955, from Java, but smaller; lobes of pronotum differently shaped, the second pair (on hind lobe) is much smaller, and narrower; pro-

portions of antennal segments are also different, segment II is as long as I (much longer in *U. walshi*); PE-VII in the female are less produced backward.

Measurements: head as long as width across eyes (♂-28:27.5, ♀-32:32); proportions of antennal segments, I to IV, are: ♂-11:11:12:10.5, ♀-14:14:15:12; pronotum less than half as long as its maximal width (♂-25:62, ♀-34:79); scutellum shorter than width at the base (♂-25:36, ♀-35:48); abdomen longer than maximal width across segment IV in the male, but shorter in the female (♂-85:73, ♀-96:100); hypopygium longer than maximal width (25:23).

Spiracles II to VII ventral, placed far from the border, VIII lateral and visible from above.

Color: brown to dark brown, partially ferrugineous; antennae, tips of antenniferous tubercles, lobes of pronotum, rostrum, and legs, are yellow brown. Connexivum yellow brown mottled with brown. One female was lighter, with yellow patches on the head, pronotum, and scutellum; connexivum was mostly yellow.

Total length: ♂-6.60, ♀-8.00 mm.; width of pronotum: ♂-2.48, ♀-3.16 mm.; width of abdomen: ♂-2.92, ♀-4.00 mm.

Holotype: ♂, Bismarck Isls. — NEW BRITAIN: Yalom, 1000 m., 10.V.1962; deposited in the Zoological Museum, Copenhagen.

Allotype: ♀, collected with holotype; in the same collection.

Paratypes: 5 ♂ & 2 ♀, collected with holotype; in the same collection, and collection of author.

Gen. **Arictus** Stål, 1865.

1. **Arictus tagalicus** Stål.

Arictus tagalicus Stål, 1870, Öfv. Vet. Ak. Förh., 27:672.

Brachyrhynchus tagalicus Bergroth, 1886, Verh. Zool. Bot. Ges., Wien, 36:59.

Arictus tagalicus Usinger and Matsuda, 1959, Class. Aradidae, p. 314.

Philippines. — BALABAC: Dalawan Bay, 1 ♂, 1 ♀, 13.X.1961.

Distribution: Philippines.

2. **Arictus lobuliventris** (Kormilev).

Mezira lobuliventris Kormilev, 1953, Verh. Naturf. Ges. Basel, 64:340.

Arictus lobuliventris Usinger and Matsuda, 1959, Class. Aradidae, p. 314.

Bismarck Isls. — MUSSAU: Talumalaus, 1 ♀, 9.II.1962.

Distribution: Bougainville; New Guinea.

3. **Arictus thoracoceras** (Montrouzier).

Aradus thoracoceras Montrouzier, 1855, Ann. Soc. Phys. Lion, (2) 7:107.

Arictus thoracoceras Stål, 1870, Öfv. Vet. Ak. Forh. 27:672.

Brachyrhynchus thoracoceras Bergroth, 1886, Verh. Zool. Bot. Ges., Wien, 36:59.

Mezira thoracocera Kormilev, 1955, Rev. Ecuat. Ent. Paras., 2:500.

Arictus thoracoceras Usinger and Matsuda, 1959, Class. Aradidae, p. 314.

Bismarck Isls. — NEW BRITAIN: Cape Hoskins, Valoka, 2 ♂, 1 nymph, 10.VII.1962. — DUKE OF YORK: Manuan, 5 ♂, 4 ♀, 3 nymphs, 19—20.VII.1962. — NEW IRELAND: Danu, Kalili Bay, 8 ♂, 8 ♂, 30.IV.1962.

1 ♂ from the Philippines probably belongs to this species — TAWI TAWI: Tarawakan, 23.X.1961.

Distribution: originally described from New Caledonia, found also in New Guinea and Solomon Islands; it was mentioned also from Australia, but never I have seen specimens from there, and I think that it was confused with an Australian species, *Arictus monteithi* Kormilev, 1965, which is common in Queensland.

Gen. **Daulocoris** Usinger and Matsuda, 1959.

1. **Daulocoris auritomentosus** (Kormilev), 1955.

Mezira auritomentosa Kormilev, 1955, Rev. Ecuat. Ent. Paras., 2:488.

Daulocoris auritomentosus Usinger and Matsuda, 1959, Class. Aradidae, p. 324.

Bismarck Isls. — NEW BRITAIN: Yalom, 1000 m., 1 ♀, 21.V. 1962.

Distribution: Indonesia (Borneo).

Gen. **Mezira** Amyot and Serville, 1843.

1. **Mezira membranacea** Fabricius.

Aradus membranaceus Fabricius, 1803, Syst. Rhyng., p. 118.

Brachyrhynchus membranaceus Stål, 1868, Hem. Fabr., 1:96.

Mezira membranacea Kormilev, 1953, Verh. ent. Ges., Basel, 114:339.

Philippines. — MINDANAO: Sapamoro, Curuan District, 5 ♂, 7 ♀, 8 nymphs, 20.XII.1961.

Distribution: from Seichelles to Japan, and from Nepal to New Guinea; recently it was imported to Hawaii. It is a large superspecies from which in last decade were separated various species, but it still waits for a thorough revision.

2. **Mezira micronesica** Esaki and Matsuda.

Mezira micronesica Esaki and Matsuda, 1951, Mushi, 22:77.

Solomon Isls. — GUADALCANAL: 17 km W. of Honiara, Rain Forest, 1 ♂, 28-29.VII.1962.

Distribution: Micronesia, New Guinea, Solomon Islands, Wallis Isl.

Closely related to *M. membranacea* F., and previously confused with it. Maybe only a geographical subspecies of the latter.

3. **Mezira subtriangula** Kormilev.

Mezira subtriangula Kormilev, 1957, Ann. Mag. Nat. Hist., (12) 10:269.

Bismarck Isls. — NEW BRITAIN: Cape Hoskins, Kwalakessi, 1 ♂, 1 ♀, 3.VII.1962; Yalom, 1000 m., 1 ♂, 2 ♀, 10. and 12.V.1962. — MUSSAU: Talumalaus, 1 ♂, 3 ♀, 9.II.1962. — MANUS: Lorengau, 1 ♂, 19.VI.1962.

Distribution: New Guinea, Solomon Islands.

Previously also confused with *M. membranacea* F. Males may be easily separated from the latter, but females are very similar.

Summary.

The author has studied the Aradidae collected by the Noona Dan Expedition in 1961—62. Fourteen already known species are recorded; in several cases their distributional range is widened considerably. Four new species are described: *Carventus longiventris* n. sp. (Palawan), *Carventus oviventris* n. sp. (New Britain), *Carventus peterseni* n. sp. (New Britain), and *Usingerida parva* n. sp. (New Britain).

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Die Dynastinen, Rutelinen und Hybosorinen der Noona Dan Expedition nach den Philippinen, Bismarck- und Salomon Inseln (Col. Scarabaeidae).

Von
Dr. S. Endrödi, Budapest.

Herr Dr. Børge Petersen hat mich freundlichst beauftragt, die Dynastinen, und auch die viel kleineren Ausbeute von Rutelinen und Hybosorinen, welche die Noona Dan Expedition erbeutet hat, zu bearbeiten (Petersen, 1966, Ent. Meddr. 34: 283—304). Ich habe natürlich die Determination sehr gern übernommen, umso mehr, da die Dynastinen-Fauna des geforschten Gebietes nicht genügendermassen bekannt ist. Das Material bestand aus 170 Exemplaren, welche zu 18 Arten gehören. Unter diesen sind auch Arten, welche bis jetzt nur in wenigen Exemplaren bekannt waren und eine neue Art.

Untenstehend gebe ich die vorgefundenen Arten mit den sehr wertvollen Fundorten an, welche zur lückenhaften Kenntnis der Verbreitung der Arten einen erheblichen Beitrag leisten, sowie die Beschreibung der neuen Art und einige Bemerkungen zu den bereits bekannten Arten.

1. **Oryctoderus clypealis** Arrow.

Bismarck Isl. — MANUS: Lorengau, 24.VI.1962, 12 Ex.

Die Art wurde auf Grund von 1 ♂ aus Manus beschrieben. Das ♀ war bisher unbekannt. Es unterscheidet sich vom ♂ in den folgenden Eigenschaften: Spitze des Clipeus sehr schwach aufgebogen, Stirn kaum vertieft, die beiden Stirnhöckerchen bedeutend kleiner, Oberseite des Kopfes fein punktiert (nicht grob gerunzelt). Seiten der Flügeldecken nicht verdickt, ganz wie beim ♂, Vordertarsen dünn, Klauen einfach, gleichgeformt. — Länge: 20—25 mm.

2. **Oryctoderus coronatus** Bates.

Bismarck Isl. — NEW BRITAIN: Banauli, 2.VII.1962, 13 Ex; Valoka, 6.VII.1962, 1 Ex.

3. **Oryctoderus godeffroyi** Fairmaire.

Bismarck Isl. — MUSSAU: Malakata, 15.II. u. 11.VI.1962, 3 Ex.; Talumalaus, 19.I., 27.I. u. 6.II.1962, 3 Ex.

Die Grösse schwänkt zwischen 22 und 26 mm.

4. **Papuana woodlarkiana** var. **laevipennis** Arrow.

Bismarck Isl. — MUSSAU: Schadel Bay, 13. u. 14.II.1962, 26 Ex.; Talumalaus, 6., 9. u. 10.II.1962, 3 Ex.; Taletassi Lake, 4.VI. 1962, 13 Ex.; Boliu, 5.VI.1962, 9 Ex. — LAVONGAI: Banatam, 26.III.1962, 2 Ex. — DYAUL: Sumuna, 1. u. 6.III.1962, 3 Ex. — NEW IRELAND: Lemkamin, 900 m, 7., 11. u. 14.IV.1962, 3 Ex.; Danu, Kalili Bay, 30.IV.1962, 17 Ex. — DUKE OF YORK: Manuan, 19.VII.1962, 1 Ex. — NEW BRITAIN: Yalom, 1000 m, 9. u. 23.V.1962, 2 Ex.

5. **Papuana tridentipes** Arrow.

Bismarck Isl. — NEW IRELAND: Lemkamin, 900 m, 5.IV. 1962, 1 Ex. — NEW BRITAIN: Valoka, 10.VII.1962, 1 Ex.

6. **Papuana cheesmanae** Arrow.

Solomon Isl. — GUADALCANAL: Honiara, 27.VII.—4.VIII. 1962, 1 Ex.

7. **Papuana tibialis** Arrow.

Bismarck Isl. — NEW BRITAIN: Yalom, 1000 m, 25.V. 1962, 1 Ex.

8. **Papuana** n. sp. ?.

Bismarck Isl. — LUF (Hermit Isl.): 27.VI.1962, 1 Ex. — MANUS: Lorengau, 19.VI.1962, 2 Ex.

Alle 3 Exemplare sind Weibchen, darum möchte ich von der Beschreibung Abstand nehmen, bis auch das Männchen zum Vorschein kommt.

9. **Papuana japenensis** Arrow.

Bismarck Isl. — NEW BRITAIN: Yalom, 1000 m, 9. u. 13.V. 1962, 6 Ex.

Arrow beschrieb diese Art ebenfalls auf Grund von 1 ♂ u.zw. von der Insel Japen (nördlich von West-Neu-Guinea). Das Vor-

kommen der Art in den Bismarck Isl. ist überraschend. Ich sah die Type der Art und konnte mich überzeugen, dass die vorliegenden nicht von dieser abweichen. Arrow's Exemplar war ziemlich klein (30 mm), in der Ausbeute der Expedition sind ♂♂ bis 35 mm, bei solchen ist der Kopfhorn nicht »brevissime«, sondern ziemlich lang und auch die Aushöhlung des Halsschildes umfangreicher.

Beim ♀ ist der Clipeus fein, undicht punktiert, die Stirn stark gehöckert, Halsschild unmittelbar hinter dem Vorderrande schwach abschüssig, dahinter in der Mitte mit der Spur von einem stumpfen Buckel. Propygidium einfach fein punktiert, ohne Stridulations-Vermögen (beim ♂ sind deutliche Querrillen längs der Mitte vorzufinden), Pygidium sehr ähnlich wie beim ♂.

10. **Dipelicus robustus** Heller.

Philippines. — BALABAC: Dalawan Bay, 8., 9. u. 13.X.1961, 3 Ex.

11. **Dipelicus oryctoides** Fairmaire.

Bismarck Isl. — MUSSAU: Boliu, 5.V.1962, 1 Ex. — NEW BRITAIN: Valoka, 8.VII.1962, 1 Ex.

Solomon Isl. — GUADALCANAL: Honiara, 10.VIII.1962, 1 Ex.

12. **Dipelicus nasutus** Bates.

Bismarck Isl. — NEW IRELAND: Danu, Kalili Bay, 30.IV. 1962, 1 Ex.

13. **Cryptoryctes peterseni** n. sp.

♂: Oberseite stark glänzend schwarz bis braun, unten rotbraun. Oben kahl, Brust sehr dicht, Bauch und Pygidium spärlicher, auch die Ränder des Halsschildes und der Flügeldecken lang rot behaart.

Kopf lang, Stirn zwischen den grossen Augen stark verengt, hier wenig breiter als der Durchmesser eines Auges von oben gesehen, dann nach vorn erweitert und zwischen der Spitze des Clipeus und dem Stirnkiel am breitesten. Spitze des Clipeus mit den Vorderecken verrundet, Seiten hinter der Spitze leicht konkav, dann wieder konvex gebogen. Alle Ränder (der Spitzenrand breiter und stärker) aufgebogen. Oberseite und der ziemlich hohe, stumpfe Stirnkiel, welcher bei den kleinen Exemplaren kürzer ist, ziemlich grob gerunzelt punktiert. Wangenecken vom Kopfrande stark, stumpeckig abgesetzt, lang, aufstehend rot be-

haart. Stirn und Scheitel glatt, glänzend, kahl. Mandibeln neben dem Clipeus vorstehend, aussen einfach konvex gebogen, ohne Zähne. Fühler 10-gliedrig, die Fahne gerade, ziemlich breit oval, etwas kürzer als alle übrigen Glieder zusammen.

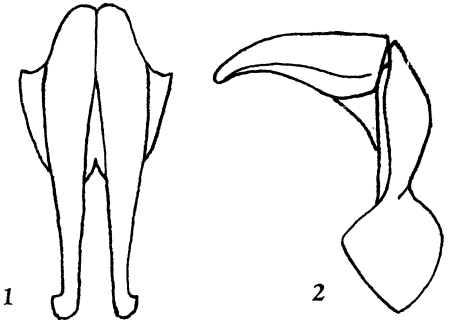
Halsschild ohne Apikalhorn etwa doppelt so breit wie lang, Vorderecken hinter den Augen stumpfwinklig. Seiten hinter den Vorderecken stark konkav eingeschnitten, dann bis zur Mitte leicht konvex, hinter der fast abgerundet-eckig erscheinenden Mitte bis zu der stumpfeckigen Hinterwinkel sehr schwach konkav gebogen. Basis schwach doppelbuchtig, scharf gerandet. Seitenränder scharf, leicht aufgebogen. Die ganze Oberseite vollkommen glatt, stark glänzend, mit 3 Hörnern (etwa wie bei vielen amerikanischen *Strategus*-Arten): der apikale Horn bei grossen Exemplaren horizontal nach vorn gerichtet, die zweizähnige Spitze aufgebogen, die Spitze des Kopfes weit überragend. Hinten wird die Oberseite des Apikalhorns stumpfkielig nach hinten fortgesetzt. Die beiden Seitenhörner entspringen etwas hinter der Mitte des Halsschildes, ganz an den Seiten, sie sind stärker (etwa 45°) nach oben gerichtet als der Apikalhorn, gracil, die Spitzenhälfte leicht nach innen und noch mehr nach oben gerichtet. Durch diese Hörner erscheint die vordere Hälfte des Halsschildes als beiderseits ausgehöhlt. Bei kleinen Exemplaren sind die Hörner und Unebenheiten mehr oder weniger stark reduziert, der Apikalhorn erreicht nicht die Spitze des Kopfes, aber auch bei den kleinsten sind auch die Seitenhörner sehr deutlich. Schildchen etwa so lang wie breit, die Spitze breit abgerundet, glatt, nur an der Basis mit wenigen feinbehaarten kleinen Punkten.

Flügeldecken wenig länger als zusammen breit (14:12), Seiten in der vorderen Hälfte parallel, dann gebogen und zur gemeinschaftlich breit abgerundeter Spitze stark konvergierend. Nahtwinkeln einzeln abgestumpft. Schulterbeule stark vorspringend, innen durch eine starke Furche begrenzt, Apikalbeule praktisch fehlend. Nahtstreifen scharf eingeritzt, sonst die Oberseite nur mit angedeuteten Rudimenten von Längsfurchen. Glatt, stark glänzend, nur eine sehr feine Punktierung ist an den Seiten (besonders bei kleinen Exemplaren) und eine gröbere Punkte an der Spitze zu entdecken.

Propygidium sehr dicht, ziemlich stark punktiert, ohne Stridulationsvermögen. Prosternalzapfen sehr kurz, unter der lan-

gen Behaarung verborgen. Pygidium dreieckig, von der Seite gesehen flach, an der Basis grob und dicht, weiter hinten sehr fein punktiert, Seitenecken chagriniert.

Schenkel stark, besonders die hintersten bedeutend breiter als die übrigen, mit je einer langbehaarten, fein gefurchten Punktreihe und mit zahlreichen Haarpunkten. Vorderschienen mit 3 starken Aussenzähnen, der apikale nach vorn gerichtet, der basale nicht nach hinten abgerückt. Der lange Apikalsporn entspringt gegenüber der Ausbuchtung zwischen dem mittleren und dem basalen Zahne. Hinterschienen kurz, mit 2 Schrägkielen, an



Figs. 1—2. Kopulationsapparat von *Cryptoryctes peterseni* n. sp.

der Spitze sehr stark erweitert, abgestutzt, kurz, sehr dicht beborstet. Alle Tarsen sehr dünn, die vordersten auch beim ♂ ganz einfach, alle Klauen gleichgeformt, gleichlang. Hintertarsen etwa so lang wie die Schienen.

Kopulationsapparat Fig. 1—2. Parameren schlank, zur Spitze einfach verjüngt, die Spitze selbst nach aussen leicht erweitert, Unten ohne Zahn.

♀: unbekannt.

Länge: ohne Apikalhorn 18—23 mm.

Typen: Holotype das grösste ♂ und 2 Paratypen: Bismarck Isl. — NEW IRELAND: Lemkamin, 900 m, 11.IV.1962; 1 Paratype: detto, am 23.IV.1962 gesammelt. Die Typen sind im Universitetets Zoologiske Museum in København aufbewahrt, 1 Paratype in meiner Sammlung.

Ich widme diese schöne Art Kollegen Dr. Børge Petersen (København), dem Teilnehmer der Expedition.

Es ist eine Überraschung, dass ein Vertreter dieser Gattung

im papuanischen Gebiet vorgefunden wurde. Ich bin aber überzeugt, dass die Art in dieser Gattung eingereiht werden soll, keinesfalls ist es notwendig für sie eine eigene Gattung aufzustellen. Alle bisher bekannten Arten der Gattung kommen in Australien vor, die Revision der australischen Dynastinae von Carne (1957) beweist, dass die neue Art mit keiner der australischen Arten identisch ist. Die äusseren morphologischen Eigenschaften, die alleinstehende Form der Parameren, sowie auch die getrennte Verbreitung unterscheiden die neue Art von allen bisher bekannten.

14. **Blabephorus pinguis** Fairmaire.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 6. u. 7.IX.1961, 2 Ex.

15. **Scapanes australis grossepunctatus** Sternberg.

Bismarck Isl. — NEW IRELAND: Lemkamin, 900 m, 9., 14. u. 23.IV.1962, 3 Ex. — NEW BRITAIN: Yalom, 1000 m, 11., 16., 19. u. 23.V.1962, 5 Ex.; Valoka, 11.VII.1962, 1 Ex.

16. **Trichogomphus fairmairei** Arrow.

Bismarck Isl. — MANUS: Lorengau, 19. u. 24.VI.1962, 6 Ex. — MUSSAU: Talumalaus, 27.I. u. 4.II.1962, 2 Ex.

17. **Chalcosoma atlas** Linné.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 9.IX.1961, 1 Ex.

18. **Xylotrupes gideon** Linné.

Drei geographische Rassen:

18a. **X. gideon philippinensis** Endrödi.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 9.IX.1961, 1 Ex.; Mantalingajan, Tagembung, 1150 m, 18.IX.1961, 1 Ex.

18b. **X. gideon ulisses** Guérin.

Bismarck Isl. — LAVONGAI: Banatam, 24.III.1962, 1 Ex. — DYAUL: Sumuna, 4.III.1962, 1 Ex. — NEW IRELAND: Kawieng, 29.III.1962, 1 Ex.; Lemkamin, 23.IV.1962, 2 Ex. — NEW BRITAIN: Yalom, 1000 m, 16., 17. u. 22.V.1962, 4 Ex.; Rabaul, 28.V.1962, 1 Ex.; Valoka, 4.VII.1962, 1 Ex.

X. gideon székessyi Endrödi.

Solomon Isl. — GUADALCANAL: Honiara, 27.VII.1962, 2 Ex.

RUTELINAE.

1. **Parastasia confluens** Westwood.

Philippines. — TAWI TAWI: Tarawakan, 12. u. 26.X.1961, 3 Ex.; Lapid Lapid, 21.XI.1961, 1 Ex. — MINDANAO: Sapamoro, 17. u. 19.XII.1961, 2 Ex.

2. **Parastasia** sp.

Philippines. — BALABAC: Dalawan Bay, 7.X.1961, 1 ex.

HYBOSORINAE.

1. **Phaeochrous emarginatus** Castelnau.

Bismarck Isl. — MUSSAU: Talumalaus, 17.I.—10.II.1962, 29 Ex. — NEW BRITAIN: Kwalakessi, 3.VII.1962, 1 Ex.; Valoka, 6.VII.1962, 2 Ex.

Summary.

The collection of Dynastinae (170 specimens) contained 18 species of which one is new to science (*Cryptoryctes peterseni* n. sp. from New Ireland) and several rarely found. New locality records add much to the knowledge of the distribution of the species. Of Rutelinae and Hybosorinae only two and one species are listed, respectively.

ANMELDELSE

Leif Lyneborg: Hvad finder jeg i mark og skov. 167 sider, incl. 80 farvetavler af *Henning Anthon.* Politikens forlag, København. Pris kr. 16,25.

1. udgave: 15.000 ekspl. — Jo, Politikens forlag ved, at denne bog vil gå som varmt brød ligesom sine tre udmærkede forgængere i serien (Hvad finder jeg ... 1) i Skoven, 2) på Stranden og 3) i Sø og Å). Og den fortjener det. Ganske vist kan den kun give et begrænset billede af det artsrige dyreliv, der findes i »den del af det danske land, der ikke er skovklædt eller dækket af vand, og som ikke er klit eller hede«, sådan som mark og eng bredt defineres i forordet, og mangt og meget vil man kunne finde på en travetur, men ikke i bogen. Udvalget af arter forekommer fornuftigt. Hovedvægten er naturligt lagt på de større og almindeligste former, ofte med forkærlighed for skadedyr. Mærkeligt nok er også nogle afgjorte sjældenheder taget med (svalehalen f. eks.), og f. eks. knæleren og de to sangcikader lever slet ikke i Danmark. De udvalgte dyr, der omfatter ca. 550 arter, hvoraf ca. 425 insekter, er på det smukkeste gengivet på tavlerne. Foruden voksne dyr er der afbildet adskillige larver, og 12 af tavlerne er helliget miner og galler og er blandt de mest værdifulde og blandt de kønneste. Den ledsagende tekst, samlet på 75 sider bag i bogen, kan ikke tillade sig at gå i dybden på den begrænsede plads, når hver art skal have sit om størrelse, forekomst, levevis osv. Opremsningerne må uundgåeligt blive lidt ensformige, men forf. har hist og her indføjet lidt stof af almen karakter til opmuntring. Dette stof dukker ofte overraskende op; f. eks. er et naivt forsøg ang. sommerfuglepuppers stofskifte refereret under Mamestra persicariae. Bogen indeholder mange oplysninger, så mange, at nogle uundgåeligt må være forkerte, men man kan ikke forlange, at forf. skulle have studeret speciallitteratur for at tekste en populærbog som denne. Et kik i de nyeste skadedyrbøger ville dog ikke have taget megen tid. En række kolleger, bl. a. anm., takkes i forordet for betydelig hjælp. Anm's hjælp var dog særdeles liden, for han mener stadig, at ferskenbladlusen ikke overvintrer på abrikos, trods påstand om det modsatte p. 99, at bladhvepsene ikke adskiller sig fra andre hvepse ved at have bagkroppen fastvokset i hele sin bredde til brystet (p. 127), men ved at mangle nævneværdig indsnøring mellem 1. og 2. bagkropsled, og der er faktisk 11 gedehamsearter i Danmark, ikke kun 6, som skrevet står p. 129. Mange vil kunne få en udmærket orientering gennem denne bog.

Børge Petersen.

Entomologiske Meddelelser 35 (1967)

The Genus Ptilomera Amyot & Serville in Thailand, with a New Species from the North (Hemiptera, Gerridae).

By
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Zoological Museum, Copenhagen, Denmark.

According to Hungerford & Matsuda (1965) only one species of *Ptilomera* Am. & Serv. has been recorded from Thailand up to the present, *Pt. (s. str.) harpyia* Schmidt. In the following is a second species, here described as new, added together with some taxonomic and distributional notes for *Pt. harpyia* Schmidt.

Ptilomera (s. str.) hemmingseni sp. nov. (Figs. 1—5).

Description of apterous male:

Colour: Quite typical for the genus as described by Hungerford & Matsuda (1965, p. 399—400). Uppersurface predominantly dark yellowish brown, venter light yellowish, covered by a short, silvery pile. The type specimen has more background colour and smaller black markings than most species of the genus. Head with two pairs of small, black dots. Anterior margin of pronotum with a narrow, black spot behind inner margin of each eye; mesothorax with a black spot behind the posterolateral corners of pronotum; pleural areas with a narrow, undulating black band divided into two by a yellow stripe, covered by silvery hairs; a small spot on each acetabulum and the posterior margin of metacetabulum dark brownish. Front femur dark yellowish brown and with two narrow, longitudinal, dark stripes, the outer one the most distinct; middle and hind legs ferrugineous, apices of femora a little lighter. Abdominal tergites mostly dark yellowish brown except anterolateral corners, which are dark brownish with a

silvery pubescense; 8th abdominal and the genital segment yellowish brown; apex of the lateral wings of anal cone and claspers blackish and shiny.

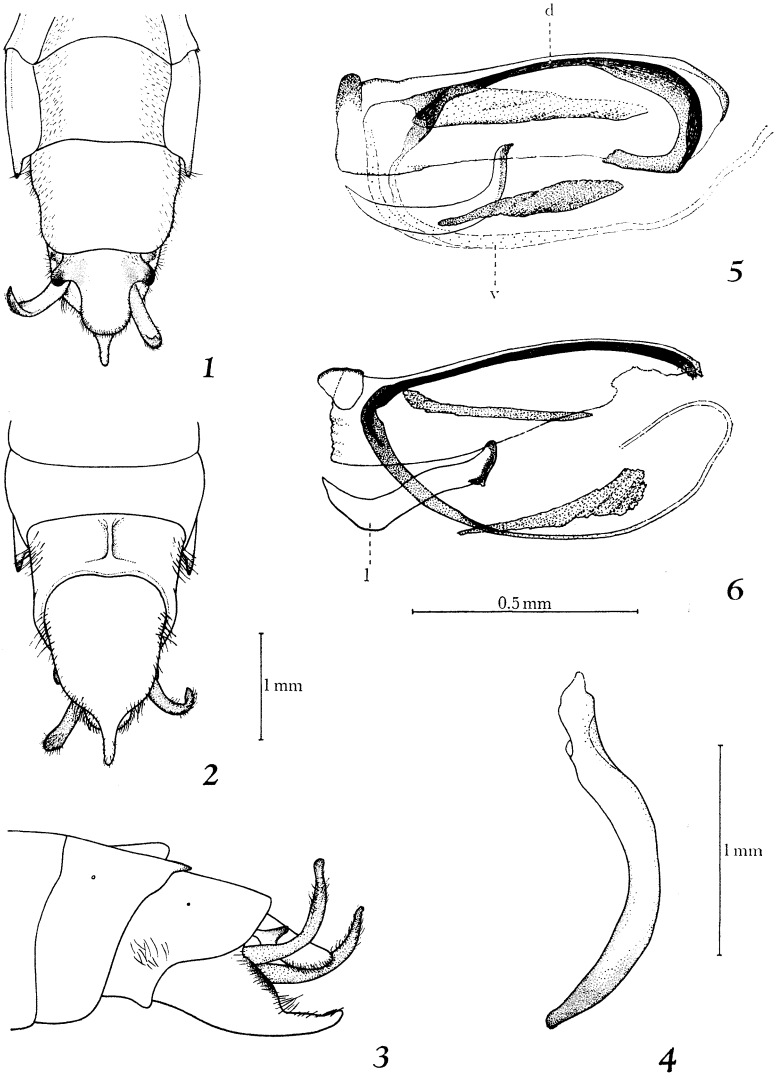
S t r u c t u r e: A rather short and broad species. Relative lengths of thorax, 1st—7th tergite, and 8th abdominal + genital segment (dorsal view): 273:163:88.*)

Front tibia with thick and long pubescense covering whole surface; middle femur with a fringe of hairs on apical half and hind coxa with a posteriorly-directed spine on hind margin; hind coxae reaching approximately to rear margin of 4th abdominal segment. 7th tergite about twice as long as 6th; posterior corners of connexivum with a short, but for this genus, remarkably prominent spine (figs. 1—3); 8th abdominal segment with a prominent median keel ventrally. Genital segment short; anal cone (fig. 1) rather characteristic, narrow and short with very short lateral wings (greatest width of anal cone: head width: 49:81), which are turned obliquely upwards and directed slightly posteriorly; apices hairless and shiny; median part of anal cone longitudinally raised; median lobe long, tongue-shaped, greatly surpassing lateral wings. Pygofer (fig. 2) short, with lateral margins subparallel basally, but with a finger-like caudal tip; the dorsolateral projections of pygofer present only as low elevations on the lateral margins (fig. 3). Claspers (fig. 4) relatively long and simply curved, with a rather short pubescense of hairs on the flattened apical part. Phallus with structure as shown in fig. 5; dorsal plates (d.) clearly separated medially except at base, with apical part prolonged and widened, hook-shaped; other sclerites also quite characteristic; ventral plates (v.) very weakly sclerotized and hardly visible.

S i z e: Total length 14.25 mm.; width of head 2.20 mm.; width

	Measurements of the appendages. (Actual lengths in mm.)
Antennal formula (1st:2nd:3rd:4th):	7.25:1.90:?:?
Front leg (femur:tibia:ta.1:ta.2):	8.35:7.25:4.75:1.65
Middle femur:	24.90
Hind femur:	32.70

*) 1 unit = 0.025 mm.



Figs. 1—5. *Ptilomera (s. str.) hemmingseni* sp. nov., holotype male. — Fig. 1. Apical part of abdomen, dorsal view, most of pubescense omitted. Fig. 2. do., ventral view. Fig. 3 do., lateral view. Fig. 4. Left clasper, hairs omitted. Fig. 5. Apical part of phallus (endosoma), lateral view, surrounded by conjunctiva showing the various sclerites. *d.* dorsal plate, *v.* ventral plate. — Fig. 6. *Ptilomera (s. str.) h. harpyia* Schmidt, from Thailand. Endosoma, lateral view. *l.* lateral plate.

of pronotum 2.35 mm.; length of mesonotum 3.60 mm.; width across mesoacetabula 3.90 mm.

Female and winged forms unknown.

Type material: Male apterous holotype labeled: "Nam Buh, N. of Prae, N. Siam, March 1941, A. M. Hemmingsen". The type is in the Zoological Museum of Copenhagen.

Comparative notes: This new species is quite unique in several aspects, but by the thorn-like projection from the rear margin of metacoxa and the fringe of hairs on middle femur in male it obviously belongs in the subgenus *Ptilomera*. So far known it is the only *Ptilomera* with distinct connexival spines in male and the only *Ptilomera s. str.* with completely reduced dorsolateral projections of pygofer. In *Pt. werneri* Hung. & Mats., 1958 from Palawan (Philippine Islands) pygofer has also a finger-like caudal tip, but the bifurcated claspers and the different shape of anal cone immediately distinguish the latter from *Pt. hemmingseni* sp. nov. The phallus-structure in the new species is e.g. strikingly different from that of *Pt. harpyia* Schmidt as shown in the figures, but as the structure of the phallic sclerites is only known in very few species of *Ptilomera* this character cannot be used to clarify the relationships of the new species.

Ptilomera (s. str.) harpyia harpyia Schmidt, 1926. (Fig. 6).

In their revision of *Ptilomera* Hungerford & Matsuda (l.c., p. 466—470) redescribe this species, originally described from Cambodia, and add Laos, Tonkin, Thailand, Burma, Malaya, and the Philippine Islands to the distributional area. The single specimen from the Philippines is probably of another species, *Pt. hungerfordi* Andersen, as pointed out by the present author (Andersen 1967).

An examination of some specimens of *Ptilomera* in the Zoological Museum of Copenhagen and the Natural History Museum, Aarhus, shows that *Pt. h. harpyia* has a still greater distributional range, exceeding that of any other species described in the genus.*)

*) *Pt. tigrina* Uhler, 1860 is probably identical with *Pt. harpyia* Schmidt as suggested by Hungerford & Matsuda (l.c., p. 463). If this is so the geographical range of this species will be extended as far north as S. China (Hong Kong). On the other hand, *Pt. harpyia ceramensis* Hung. & Mats., 1965 from Ceram, is quite certainly a distinct species, judging from the original description and figures (l.c., p. 470—473).

The author has seen a series of specimens from Sumatra together with specimens from Thailand and the islands of Koh Chang and Pulo Penang (see below).

The dorsal background colour of the specimens examined varies extensively, from blackish brown (Koh Chang) to light-ferrugineous (Thailand). The phallus-structure of the males (fig. 6), which proved to be important in the taxonomy of this difficult genus (Andersen, l.c.), is quite constant apart from minor differences. The sclerite termed lateral plate (*l.*) in fig. 6, has its anterior projection reduced in males from Koh Chang and Pulo Penang (see also Andersen, l.c., figs. 10—11, which show the phallic structure of a male from Laos-Tonkin). All females have ventrolateral lobe of seventh abdominal segment longer than the preceding venter of seventh abdominal segment, and do not key out to the *harpyia-tigrina* couplet in Hungerford & Matsuda's key to females (l.c., p. 410).

Material examined: Thailand; near Sai Yok, 5-1-1962, P. Johnsen. 3 ♂, 2 ♀ apt. (Aarhus). Koh Chang; Jan. 1900, Th. Mortensen. 3 ♂ apt., 1 nymph (Copenhagen). Pulo Penang; Mus. Westerm. 1 ♂ 1 ♀ apt. (Copenh.). Sumatra; 3/1883, Klein. 5 ♂ 4 ♀ apt. (Copenh.).

Distribution: Burma, Laos, ? N. Vietnam (Laos-Tonkin), Cambodia, ? Philippine Islands, Thailand (incl. Koh Chang; new record), Malaya (incl. Pulo Penang; new record), and Sumatra (new record).

Acknowledgments.

I am very grateful to Dr. A. M. Hemmingsen, Hillerød for the privilege of studying this interesting new species, which I name in his honour, and to Mr. Palle Johnsen, Aarhus for the loan of material from Thailand.

Summary.

A new species *Ptilomera* (*s. str.*) *hemmingseni* sp. nov. is described, being the second species of this genus known from Thailand. Some taxonomic and distributional notes for *Ptilomera* (*s. str.*) *harpyia harpyia* Schmidt are added.

Literature cited.

Andersen, N. Møller, 1967: A Contribution to the Knowledge of Philippine Semiaquatic Hemiptera - Heteroptera. — Ent. Meddr., København 35, p. 260—282, 29 figs.

Hungerford, Herbert B. & Ryuichi Matsuda, 1965: The genus Ptilomera Amyot & Serville (Gerridae: Hemiptera). — Kansas Univ. Sci. Bull., Lawrence 45(5), p. 397—515, 31 pls.

Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 54).

Die Pseudoscorpione der Noona Dan Expedition nach den Philippinen und Bismarck Inseln.

Von
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Das Material der Expedition (Petersen 1966: Ent. Meddr. 34: 283—304), insbesondere dasjenige von den Inseln des Bismarck-Archipels, setzt sich überwiegend aus terrikolen Formen zusammen, die mit Hilfe des Berlese-Trichters aus der Bodenstreu und den darunter liegenden obersten Humusschichten ausgelesen wurde. Es enthält deshalb vorwiegend die kleinsten Formen und ist verhältnismäßig einförmig. Es fehlen in ihm zahlreiche rindenbewohnende Arten, die aus diesem Gebiet bereits bekannt oder dort doch zu erwarten sind.

1. Philippinen.

Dithella philippinica n. sp. (Fig. 1).

Carapax etwas länger als breit, glatt, nur kaudolateral retikuliert, mit 40 ziemlich kurzen Borsten, hiervon 8 sowie 2 kleine Präokularborsten am Vorderrand und 4 am Hinterrand; Vorderrand gegen die Mitte ziemlich derb gezähnt, kaum eingekerbt, mit etwas vorragendem, terminal abgestutztem und dreizähnigem Epistom; Hinterrand nur seitlich durch eine flache Einschnürung abgesetzt, ohne Querfurche. Nur das vordere Augenpaar erhalten und mit gewölbter Linse das hintere Paar gänzlich reduziert, aber noch mit kleinen, tiefliegenden Pigmentresten. Abdominaltergite seitlich deutlich retikuliert, sonst glatt, einzeilig beborstet; 1. Tergit mit 4, alle übrigen mit 6 Borsten, hiervon auf dem 9. und 10. Segment 2 Tastborsten. Ebenso der 11. Sternit mit 2 Tastborsten. Chelicerenstamm mit 7 Borsten. Fester Chelicerenfinger mit 6 Zähnen, die distalen etwas größer; beweglicher Finger mit 7 kleinen Zähnen, der Subapikalzahn isoliert;

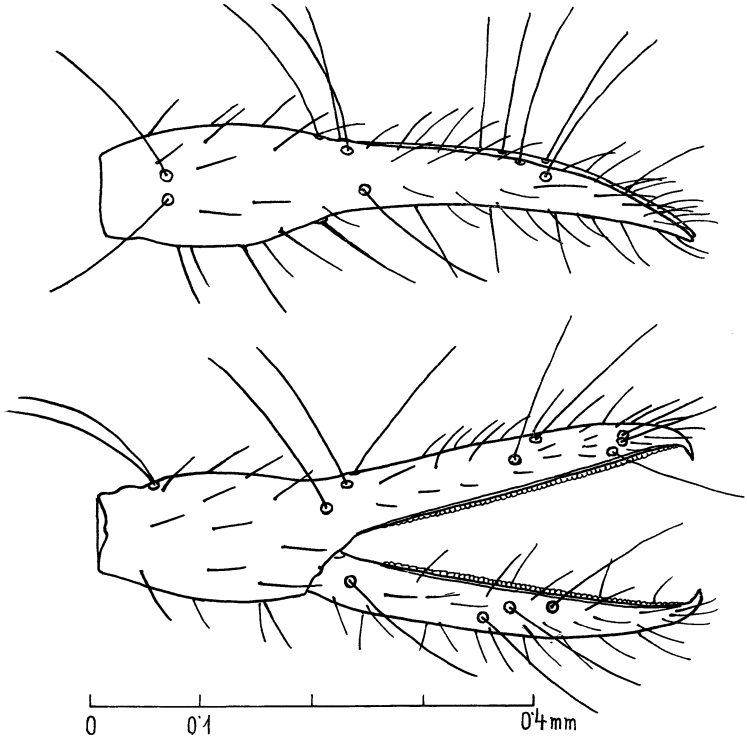


Fig. 1. *Dithella philippinica* n. sp., ♂, Palpenschere von dorsal und lateral.

ein Spinnhöcker ist nicht entwickelt. Palpenfemur etwas kürzer als der Carapax, medial fein und zerstreut granuliert. Schere 4,7-mal, Hand 1,6mal länger als breit, medial mit 3 sehr langen und kräftigen Borsten. Finger doppelt so lang wie die Hand, je mit etwas über 50 kleinen, abgestutzten, dicht stehenden Marginalzähnen, die größtenteils breiter als hoch sind. Stellung der Tasthaare für die Gattung typisch, *ib* und *isb* subbasal auf dem Handrücken, *est* und *it* distal der Fingermitte, *st* in der Mitte des beweglichen Fingers und etwas näher bei *sb* als bei *t*. Coxen des 1. Beinpaares mit kegelförmigem Oralfortsatz. Coxen des 2. und 3. Beinpaares mit je 3 ziemlich langen, beiderseits gefiederten Coxaldornen in einer Reihe. Intercoxaltuberkel mit einer Borste vorhanden. Beide Tarsenglieder der Hinterbeine mit einer Tastborste. Männliche Genitalöffnung beiderseits mit 7 ziemlich kräftigen Randborsten. — Körper-L. ♂ 0,95 mm; Carapax-L. 0,39

mm, B. 0,33 mm; Palpenfemur 0,35 mm, Hand-L. 0,19 mm, B. 0,115 mm, Finger-L. 0,36 mm.

Holotype: 1 ♂, PALAWAN: Mantalingajan, Pinigisan, 600 m, 12.IX.1961 (Mus. Kopenhagen).

Die neue Art ist von *D. javana* (Tullg.) durch geringere Borstenzahl des Carapax und der Abdominaltergite, vollständige Reduktion des hinteren Augenpaares und den Besitz von nur 3 Coxaldornen auf den Coxen des 2. und 3. Beinpaares unterschieden.

Ditha philippinensis Chamb.

1 ♂, 3 ♀, TAWI TAWI: Tarawakan, nördlich von Batu Batu, am Merkur-Licht, 13.XI.1961.

Die Art war bisher von den Philippinen-Inseln Luzon und Mindanao bekannt.

Olpium philippinum n. sp. (Fig. 2).

Carapax dunkelbraun, 1,38mal länger als breit, ohne Querfurche, glatt, nur seitlich hinter den Augen sehr fein, aber deutlich granuliert. Vorderaugen (Durchmesser 0,06 mm) etwas größer als die von ihnen um etwa 1/3 Durchmesser abstehenden Hinteraugen. Abdominaltergite mit Ausnahme der 3 schmäleren und heller braunen vordersten dunkelbraun, glatt, mit relativ derben Borsten; Chätotaxie: 2-4-4-6-6-6-6-6-6-5 (einzelne überzählige Borsten kommen vor), das mediane Borstenpaar des 10. und 11. Segments zu Tastborsten verlängert, die Medialborste

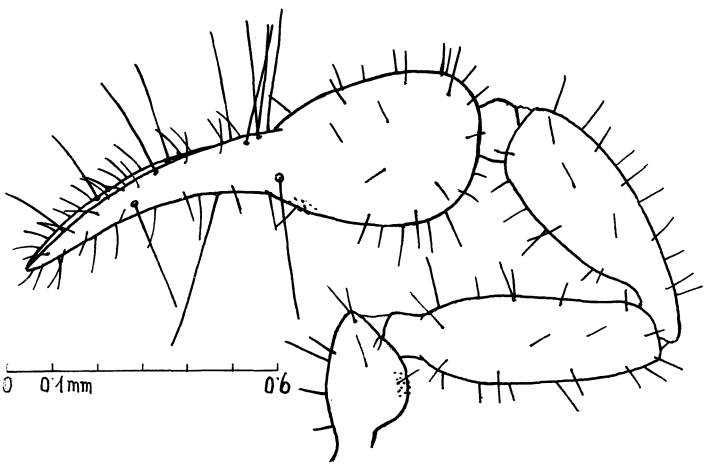


Fig. 2. *Olpium philippinum* n. sp., ♂, rechte Palpe.

des 11. Tergits in discaler Stellung. Sternite größtenteils mit 4 Borsten, der Endsternit mit einem Tastborstenpaar und einer unpaarigen Medianborste. Chelicerenstamm mit 5 Borsten. Subapikallobus des beweglichen Chelicerenfingers flach, undeutlich zweiteilig. Galea schlank, mit 3 kleinen Terminalästchen; Galealborste gekrümmt, kaum die Mitte der Galea erreichend. Palpen dunkelbraun, die Gliedenden und Finger etwas heller, alle Glieder glatt, nur der Trochanter hinten und die Hand mediodistal fein und spärlich granuliert, die Vestituralborsten verhältnismäßig derb und ziemlich lang, die medialen Borsten zumeist länger als die Breite der Gliedstiele. Trochanter hinten ziemlich stark gebraucht, aber ohne Höcker. Femur gut gestielt, ohne Tastborste, 3,2 bis 3,3mal, Tibia 2,9 bis 3mal, Hand 1,6 bis 1,7mal, Schere mit Stiel 3,4 bis 3,6mal, ohne Stiel 3,2 bis 3,4mal länger als breit. Finger deutlich länger als die Hand mit Stiel, bis zur Basis dicht bezahnt. Stellung der Tasthaare für die Gattung vollkommen typisch, *it* distal von *est* und etwas verkürzt. Telofemur der Vorderbeine fast 1/3 kürzer als das Basifemur und gegen dieses beweglich. Hinterfemora breit. 1. Tarsenglied der Hinterbeine mit einer basalen Tastborste. Arolien etwas länger als die Klauen, einfach. — Körper-L. ♂ 2 mm; Carapax-L. 0,65—0,69 mm, B. 0,47—0,50 mm; Palpen: Femur-L. 0,60—0,61 mm, B. 0,18—0,19 mm; Tibia-L. 0,60 mm, B. 0,20—0,21 mm; Hand-L. 0,53—0,55 mm, B. 0,31—0,33 mm; Finger-L. 0,60—0,63 mm.

Holotype: 1 ♂, PALAWAN: Brooke's Point, Uring Uring, in der Strandzone, 17.IX.1961 (Mus. Kopenhagen).

Paratype: 1 ♂ (nicht ganz ausgefärbt) mit den gleichen Funddaten.

Die neue Art ist mit *O. jacobsoni* Tullg. sehr nahe verwandt und stimmt mit diesem weitgehend überein, doch sind die Vestituralborsten länger, die Palpen etwas schlanker und die Finger deutlich länger als die Hand mit Stiel.

Pseudochiridium clavigerum (Thor.).

1 ♂, BALABAC: Dalawan Bay, am Merkur-Licht, 5.X.1961.

Die Art ist von der Malayischen Halbinsel bis Neu-Guinea verbreitet und tritt örtlich mitunter in großer Zahl auf.

Stenatemnus böttcheri Beier.

1 ♂, PALAWAN: Mantalingajan, Pinigisan, 600 m, 12.IX.1961.

Die Art war bisher nur von der Philippinen-Insel Leyte bekannt.

Withius subruber (Sim.).

1 ♂, KEY-INSELN: N. von Doe Roa, 60 m, Netzfang von Lithothamnion auf Sandboden, 24.IV.1922, Th. Mortensen leg.

Eine nahezu kosmopolitisch verbreitete, vorwiegend in Getreidespeichern u. dergl. anzutreffende Art.

Lophochelifer philippinus (Beier).

1 ♂, PALAWAN: Mantalingajan, Pinigisan, 600 m, 2.IX.1961. — 1 ♂, MINDANAO: Sapamoro, Curuan-Distrikt, 14.XII. 1961.

Die Art lag mir auch von Nord-Borneo vor.

2. Bismarck-Inseln.

Tyrannochthonius (T.) beieri Morik.

4 ♂, 5 ♀, 11 Nymphen, NEW BRITAIN: Valoka, Berlese-Nr. 72, 74—78, 80, 13.VII.1962. — 2 ♂, 1 ♀, 2 Nymphen, DYAUL: Kollepine, Berlese-Nr. 8—10, 12.III.1962. — 3 ♂, 1 ♀, LAVONGAI: Banatam, Berlese-Nr. 16, 19, 20.III.1962. — MUSSAU: 5 ♂, 1 ♀, Boliu, Berlese-Nr. 52, 53, 4.VI.1962; 1 ♂, 1 Nymphe, Malakata, Berlese-Nr. 58, 11.VI.1962. — 4 ♂, 1 ♀, 5 Nymphen, MANUS: Lorengau, Berlese-Nr. 62, 63, 67, 70, 22.VI.1962.

Die Art war bisher nur von den Salomon-Inseln bekannt, wo sie in der Bodenstreu sehr häufig ist. — Die Chätotaxie der Abdominaltergite ist bei ihr variabel. Es können bereits am 5. Tergit 5 oder 6 Borsten auftreten, ein Männchen von der Insel Dyaul hat sogar vom 6. Tergit an 6 Borsten. In der Regel treten allerdings beim Männchen erst vom 7., beim Weibchen von 6. Segment an 6 Borsten auf.

Tyrannochthonius (Lagynochthonius) arctus n. sp. (Fig. 3).

Carapax, Abdominaltergite, Cheliceren und Femora der beiden hinteren Beinpaare blaß olivenbraun, Palpen hell rötlichbraun. Carapax quadratisch, durch die im Zuge des konkaven Basalrandes etwas kaudalwärts gezogenen Hinterecken jedoch etwas länger erscheinend, in Augenhöhe am breitesten, nach hinten leicht verschmälert, glatt, nur in den Hinterecken derb retikuliert; mit 16 derben Borsten und 2 kleinen Präokularbörstchen, hiervon 4 Vorderrand- und 2 Hinterrandborsten, nur die 6 Discalborsten sehr lang, die beiden einander stark genäherten medianen Vorderrandborsten und die Hinterrandborsten nur halb so lang, die 6 übrigen Borsten (laterale Vorderrand-, Interokular- und Postoku-

larborsten) wiederum um die Hälfte kürzer; Vorderrand gerade, glatt, gänzlich ohne Epistom, an dessen Stelle sogar ziemlich tief eingekerbt. Augen sehr groß, einander bis auf den halben, 0,04 mm betragenden Längsdurchmesser genähert, die Vorderaugen stärker gewölbt, die Hinteraugen flacher. Abdominaltergite quer retikuliert, die der Segmente 1 bis 8 mit je 4, 9. und 10. Tergit mit 5 Borsten; Endtergit mit 2 langen Tastborsten und einem Paar kurzer Medianborsten. Sternite größtenteils mit 8 Borsten, die Lateralborsten bis zum 8. Segment kurz, auf dem 9. und 10. Segment lang, hier das submediane Borstenpaar verlängert; 11. Sternit mit dem Endtergit verwachsen und borstenlos. Analkonus mit

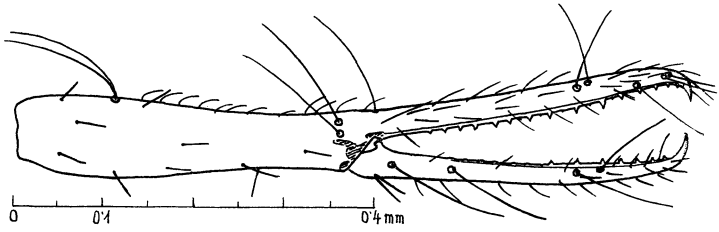


Fig. 3. *Tyrannochthonius* (*Lagynochthonius*) *arctus* n. sp., ♂, Palpenschere lateral.

2 Ventralbörstchen. Chelicerenstamm glatt, mit 5 Borsten, die subbasale Lateralborste sehr kurz. Fester Chelicerenfinger mit einer Reihe von etwa 8 Zähnen, der distale vergrößert; beweglicher Finger mit ungefähr 10 Zähnchen, ohne Spinnhöcker. Palpen sehr schlank, glatt, das Femur fast 1,7mal länger als der Carapax. Hand sehr schmal flaschenförmig, 4mal, die Schere 8,3mal länger als breit. Finger kaum länger als die Hand, der feste mit 15 weit getrennt stehenden, dreieckigen und spitzigen Zähnen, zwischen denen sich höchstens ein winzig kleines Körnchen als Rest eines Interkalarzahnes befindet; beweglicher Finger distal mit 7 Zähnen, deren Reihe proximal vom Tasthaar *st* endet, sonst mit einigen flachen Zahnrudimenten. Das Tasthaar *eb* dicht neben *esb*, *ist* relativ weit distal stehend; Stellung der anderen Tasthaare normal. Coxen des 1. Beinpaares mit langem Oralfortsatz. Coxen des 2. Beinpaares mit einer Reihe von 8 bis 9 flachen, distal pinselförmig gefransten Coxaldornen. Coxen des 3. und 4. Beinpaares mit einer Reihe von 4 Borsten und einer längeren Apikalborste.

Kein Intercoxaltuberkel. Hinterfemora lateral fein und zerstreut, aber scharf granuliert. Ränder des männlichen Genitalspalts fein kreneliert, oral mit 6 bis 7 Randborsten. — Körper-L. ♂ 1,2 mm; Carapax-L. 0,31 mm (Seitenrand 0,33 mm), B. 0,31 mm; Palpenfemur 0,52 mm, Hand-L. 0,36 mm, B. 0,09 mm, Finger-L. 0,37 mm.

Holotype: 1 ♂, Bismarck-Ins., MANUS: Lorengau, Berlese-Nr. 63, 22.VI.1962 (Mus. Kopenhagen).

Paratype: 1 Nymphe, Bismarck-Ins., LAVONGAI: Banatam, Berlese-Nr. 20, 23.III.1962.

Die neue Art steht dem *T. (L.) novaeguineae* Beier sehr nahe, unterscheidet sich jedoch von ihm durch noch schlankere Palpen, die auffallend ungleich langen Borsten des Carapax, dessen in der Mitte eingekerbten Vorderrand, den Besitzt von durchgehend nur 4 Borsten auf den Abdominaltergiten 1 bis 8, die Bezahnung der Palpenfinger und die größere Anzahl von Coxaldornen.

Morikawia nana Beier.

2 ♀, DUKE OF YORK: Manuan, Berlese-Nr. 82, 21.VII.1962. — 2 ♂, 5 ♀, 6 Nymphen, DYAUL: Sumuna, Berlese-Nr. 5, 7, 7. und 11.III.1962. — 3 ♀, 1 Nymphe, LAVONGAI: Banatam, Berlese-Nr. 15, 16, 27, 20. und 26.III.1962. — 1 ♂, 1 Nymphe, MUSSAU: Boliu, Berlese-Nr. 53, 56, 4. und 7.VI.1962. — 8 ♂, 9 ♀, 8 Nymphen, MANUS: Lorengau, Berlese-Nr. 62—67, 69, 22.VI.1962.

Die Art war bisher nur von den Salomon-Inseln bekannt.

Ideobisium bipectinatum Daday.

5 ♂, 4 ♀, DUKE OF YORK: Manuan, Berlese-Nr. 82, 85, 89, 91, 93, 21.VII.1962. — DYAUL: 1 ♂, Sumuna, Berlese-Nr. 7, 11. III.1962; 1 ♂, Kollepine, Berlese-Nr. 8, 12.III.1962. — 3 Nymphen, LAVONGAI: Banatam, Berlese-Nr. 28, 26.III.1962. — 2 ♂, 2 ♀, 1 Nymphe, MANUS: Lorengau, Berlese-Nr. 62, 63, 66, 22.VI.1962.

Die Art ist sonst über Neu-Guinea, die Schouten-Inseln und Neu-Britannien verbreitet.

Euryolpium salomonis (Beier).

2 Nymphen, DUKE OF YORK: Manuan, Berlese-Nr. 92, 21.VII. 1962.

Von den Salomon-Inseln bis Neu-Guinea verbreitet; Erstnachweis für die Bismarck-Inseln.

Xenolpium novaguineense Beier.

3 ♂, 3 ♀, 8 Nymphen, NEW BRITAIN: Valoka, Berlese-Nr. 72—74, 79, 13.VII.1962.

Von Neu-Guinea bis zu den Salomon-Inseln verbreitet, für Neu-Britannien jedoch hiermit erstmals nachgewiesen.

Anatemnus megasoma (Daday).

1 ♂, NEW BRITAIN: Valoka, Cape Hoskins, in der Bodenstreu des Regenwaldes, 13.VII.1962.

Die Art war bisher nur von Neu-Guinea bekannt. — Die Abdominaltergite des vorliegenden Exemplares tragen größtenteils auch eine Discalborste.

Stenatemnus fuchsi (Tullg.).

2 ♂, NEW BRITAIN: Yalom, 1000 m, 9.V.1962.

Die Art ist von den Sunda-Inseln (Sumatra, Java, Borneo) und den Philippinen (Misamis) über Celebes, Neu-Guinea und den Bismarck-Archipel bis zu den Salomon-Inseln verbreitet.

Acanthicochernes biseriatus Beier.

1 ♀, MUSSAU: Malakata, 11.VI.1962.

Die Art war bisher nur von den Salomon-Inseln (Guadalcanal) bekannt.

Smeringochernes aequatorialis (Daday).

1 ♀, MUSSAU: Talumalaus, unter Insekten in der Robinson-Falle, 20.I.1962. — 1 Nymphe, DYAUL: Sumuna, Berlese-Nr. 6, 11.III.1962.

Die Art war bisher nur von Neu-Guinea und der Insel Biak bekannt.

Cacoxylus echinatus (Beier). (Fig. 4).

1 ♂, MUSSAU: Talumalaus, unter Insekten in der Robinson-Falle, 20.I.1962.

Das bisher noch unbeschriebene Männchen dieser auf den Salomon- und Bismarck-Inseln lebenden Art unterscheidet sich vom Weibchen sehr auffällig durch wesentlich schlankere Palpen, gestreckteren Körper, längeren Carapax und einige bemerkenswerte morphologische Sexualauszeichnungen. Das Integument ist durchgehend sehr schwach sklerotisiert und daher hell bräunlichgelb, nur der vorderste Teil des Carapax und die Palpen sind hell rötlichbraun. Der Carapax ist 1/4 länger als breit und ebenso wie die Tergite dicht granuliert, außerdem mit gröberen borstentragen-

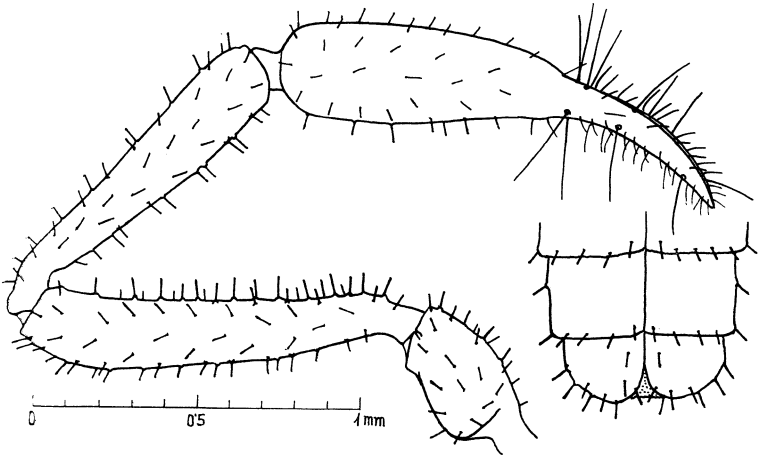


Fig. 4. *Cacoxylus echinatus* (Beier), ♂, linke Palpe und Abdomenende in Dorsalansicht.

den Körnern besetzt. Abdomen schmal und lang. Tergite und Sternite je mit einem orangegelben Fleckenpaar (Ansatzstellen der Dorsoventralmuskeln). Endtergit und Endsternit tief eingeschnitten, bis zum Grunde geteilt und hinten breit verrundet zweilobig, der Einschnitt durch eine dünne, granulierte Membran ausgefüllt; der Endtergit überragt den Endsternit. 5. und 6. Sternit vor dem Hinterrand mit etwa 3 unregelmäßigen Querreihen kurzer Sinnesbörstchen. Männliches Genitalorgan mit einem kräftigen, gewundenen Chitinrohr. Galea fast einfach, pfriemenförmig zugespitzt. Palpen sehr schlank, der Trochanter viel länger als beim Weibchen, deutlich granuliert, Femur und Tibia jedoch nur fein und flach granuliert, aber mit gröberen borstentragenden Körnern besetzt. Femur distalwärts allmählich keulenförmig verdickt, 5,6mal, Tibia 5,2mal, Hand 3mal, Schere mit Stiel 5mal, ohne Stiel 4,7mal länger als breit. Die Hand fast zylindrisch, mediodistal leicht konkav. Finger bedeutend kürzer als die Hand ohne Stiel, die Stellung der Tasthaare wie beim Weibchen. — Körper-L. ♂ 3,5 mm; Carapax-L. 1 mm, B. 0,75 mm; Palpen: Femur-L. 1,20 mm, B. 0,215 mm, Tibia-L. 1,10 mm, B. 0,21 mm, Hand-L. 0,94 mm, B. 0,30 mm, Finger-L. 0,63 mm.

Lophochelifer insularis Beier.

1 ♀, NEW BRITAIN: Yalom, 1000 m, 19.V.1962.

Die Art lag mir bisher von den Neuen-Hebriden und von Neu-

Guinea vor. — Bei dem vorliegenden Weibchen ist der Nebenzahn der Klauen kürzer als bei der Type und nur etwa 1/3 so lang wie die Hauptklaue von der Teilungsstelle an.

Summary.

From the southern Philippines, the Kei Islands and the Bismarck Islands 6, 1, and 12 species are recorded, respectively. Distributional notes are given. 2 new species are described from the Philippines (genera: *Dithella* and *Olpium),* and 1 species from the Bismarck Islands is considered new to science (in the genus *Tyrannochthonius* (*Lagynochthonius*)). The male of *Cacoxylus echinatus* (Beier) is described. Besides the new species one species is new to the Philippines and 7 species are recorded from the Bismarck Islands for the first time.

Platyptilia tesseradactyla L., ny dansk Fjermøl (Lep., Pterophoridae).

Af
N. Ulrik Møller
Mylius Erichsensvej 88, Ålborg.

Den 9/6 1965 fangede jeg på lys på Ovtrup Hede i Himmerland en iøjnefaldende Fjermøl og dagen efter, den 10/6, ved aftenstid endnu et stykke af samme art, der iøvrigt blev genfundet på lokaliteten i 1966. Ved min undersøgelse af dyret kom jeg til det resultat, at det måtte dreje sig om ovennævnte art, hvilket også senere er verificeret af Ing. Niels L. Wolff, København.

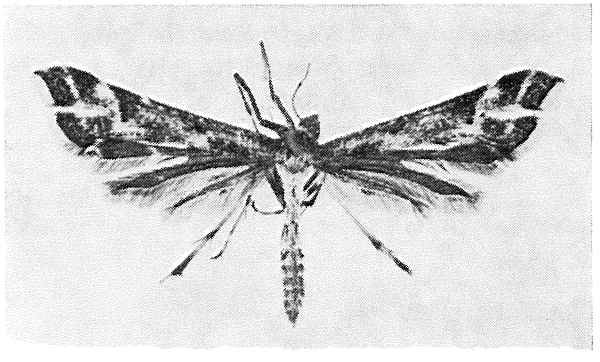


Fig. 1. *Platyptilia tesseradactyla* L. Naturlig størrelse ca. 18 mm.

W. van Deurs omtaler *P. tesseradactyla* i sin bog »Fjermøl« 1948, pag. 21, og angiver at den må kunne findes i Danmark. Den angives at være taget i Sverige, Nordtyskland og England.

P. tesseradactyla ligner lidt *P. gonodactyla,* men er dog noget mindre, vingefang 18—19 mm, brunlig, isprængt en del hvidt. Tværs over begge forvingeflige går to hvide linier. Den yderste er en tynd fint tegnet linie, hvorimod den indre, der går tværs over ved indskæringens rod, er mere udflydende og bredere. Ved indskæringens rod er inderste linie indad begrænset af 1 eller

måske rettere 2 sammenhængende sortbrune pletter. Frynserne er hvide. Sømfrynserne indad kantet af fin ren, tynd, sort rodlinie. På kanten ved enden af ribberne 1b, 1c og 2 er de hvide frynser afbrudt af 3 rene sortbrune pletter. Bagvingerne er ensfarvede brune, og skæltanden er ganske lille, anbragt ca. midt på bageste bagvingeflig.

Larven angives at leve i stænglerne af Evighedsblomst og Kattefod, hvilket er i god overensstemmelse med findestedet, hvor der voksede en del Kattefod (Antennaria dioica) spredt over heden.

Såvel Karl Eckstein som Spuler angiver *P. tesseradactyla* fra Nord- og Midteuropa, fra først i maj til begyndelsen af juni. Spuler har iøvrigt, efter min mening en dårlig illustration.

Fra England omtales *P. tesseradactyla* af L. T. Ford i hans fortegnelse over britiske småsommerfugle 1949. Bryan P. Beirne 1952 angiver endnu ikke fundet i England, men har en temmelig god illustration af dyret. Iøvrigt er *P. tesseradactyla* kendt fra det vestlige Irland.

Fra Sverige meddeles om fund af *P. tesseradactyla* spredt over næsten hele landet. Der mangler dog angivelser fra Halland og Blekinge, de to len der vender umiddelbart over mod Jylland.

Den er endvidere fundet i Finland.

Summary.

The Plume Moth, *Platyptilia tesseradactyla* L., is recorded as new to the Danish fauna, taken in Jutland in a heath area with Antennaria.

Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 57.)

A New Species of Falsorhipidius Pic, with Notes on the Genus (Col., Rhipiphoridae).

By
Børge Petersen
Zoological Museum, Copenhagen.

During the Danish investigations made by the Noona Dan Expedition in the Bismarck Archipelago (Petersen 1966) a specimen was collected of the peculiar Rhipidiinae, a specialized subfamily of the Rhipiphoridae (Besuchet 1956:140). The specimen belongs to *Falsorhipidius* Pic, the most advanced genus of the group, with only one known species, viz. *arcuaticornis* Pic from Vietnam. An examination of one of the two syntypes of *F. arcuaticornis,* kindly lent me by Dr. Claude Besuchet, Lausanne, and the present specimen is the occasion of the following notes on the genus and the description of a new species, below.

I acknowledge with gratitude Dr. Besuchet for giving me the opportunity of studying material of *F. arcuaticornis.*

Comments on the genus *Falsorhipidius* Pic.

The description of the genus by Pic (1947:2) was greatly amended by Besuchet (1957:344) after a re-examination of the material of *F. arcuaticornis.* A few corrections and additions may still be appropriate, however, based on a better preserved material.

The scapes are virtually free from each other, not firmly united by their dorsal surfaces as said by Besuchet (1957: 344, 345). He uses the French wording "soudés ensemble", meaning soldered or weldered, about the conditions of the scapes. However, they could be separated from one another in the borrowed syntype of *F. arcuaticornis* after soakening of the specimen; they were just kept together by some shrivelled dirt.

The rudiment of the maxillary palps is provided with two openings, one posteriorly on either side of the spherical structure (figs.

3, 5). The holes are probably closed by delicate membranes but these could not be recognized. They remind of the oval areas found in the second article of the maxillary palps in *Rhipidius quadriceps* Ab. (Besuchet 1956: 120, fig. 66).

The thorax as seen from above is described and figured by Besuchet whereas he left the lateral parts of thorax un-commented, probably because of the insufficient material at hand. The general appearance in *F. lemkaminensis* n. sp. can be seen from fig. 2, which roughly corresponds to the conditions in *arcuaticornis,* too. The anatomy is mainly as found in *Rhipidius* (Besuchet 1956). A triangular pro-episternum is clearly visible. Mesosternum is large and well defined whereas mesepisternum is a narrow, weakly sclerotized sclerite and mesepimeron is not clearly defined. The oval sclerite further backwards is in my opinion a secondary plate set off from the large metepisternum, separated from it by a fold. It is no doubt the same plate as the one called (v) by Besuchet (1956:122, figs. 74, 75) in *Rhipidius*. Apparently Besuchet finds that (v) belongs to mesothorax, however.

The wings of *Falsorhipidius* were not described in detail by Besuchet and only very roughly figured. A better and more correct impression of the wings may be obtained from fig. 2. The venation shows traces of both Sc and S and the better defined R-complex and M. The courses of the veins are mainly indicated by folds and pigmentation.

The abdomen is in general as shown in figs. 1 and 2 in both *arcuaticornis* and the new species described below. The large, concave first abdominal tergite is remarkable.

The terminalia can not be described in detail from the insufficient material at hand because of the delicate structure of the sclerites, but in general they seem to follow the same scheme as in *Rhipidius*. Aedeagus of both known species are shown in figs. 7 and 8; fig. 9 shows penis with its oval apical orifice.

Falsorhipidius lemkaminensis n. sp.

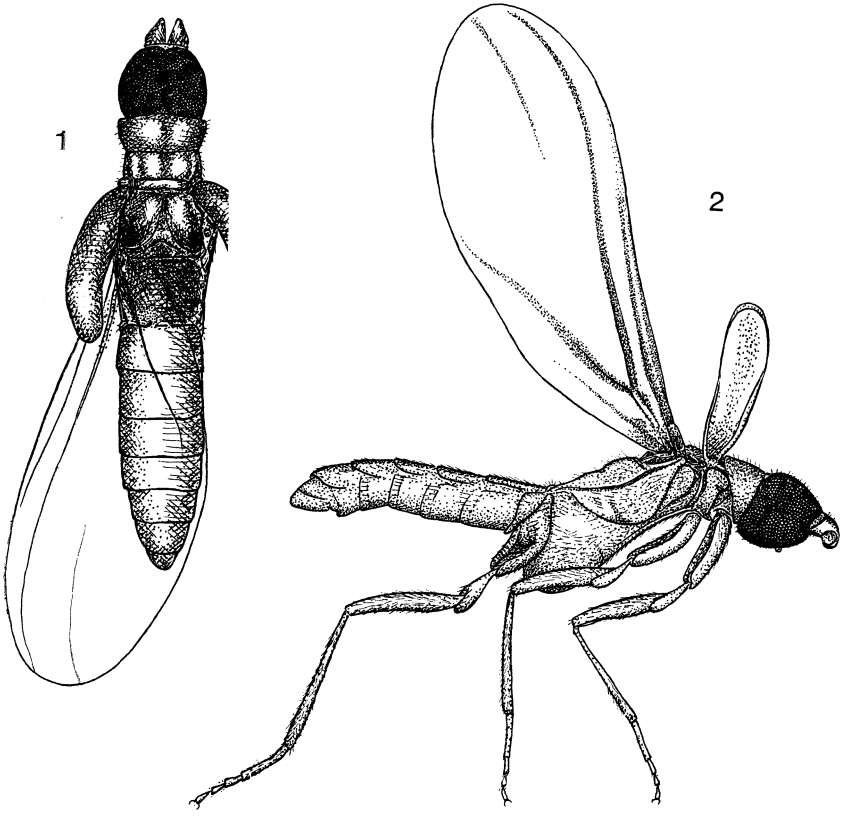
Type material:

Bismarck Islands. — NEW IRELAND: Lemkamin, Lelet Plateau, 900 m a.s.l., 1 ♂, holotype, 21 April 1962, caught in a Mercury light trap (Noona Dan Exped.); type in the Zoological Museum, Copenhagen, Denmark.

Description:

Size. Length of head and body 3 mm, of elytra 1 mm, and of wings 2.6 mm, approximately.

Colour in general dull brownish; meso- and metathorax palest. not much deviating from other parts of body but in con-



Figs. 1—2. *Falsorhipidius lemkaminensis* n. sp. ♂, holotype, in dorsal (1) and lateral (2) view. Nat. size of body, 3 mm. Outer antennal articles missing. Hairs only approximate and omitted in the wings in order to show the venation.

trast to the head covered by the large black eyes. Wings are also dark, smoky, due to a vestiture of blackish microthricia.

Sculpture not pronounced in any part of the specimen; in dried condition, however, in some areas, the cuticula looks as

irregularly reticulated, a shrinking phenomenon due to weak sclerotization.

H a i r s are not conspicuous, although in some places rather long as indicated in fig. 2. They are mainly well spaced, shining, whitish grey.

S t r u c t u r e. The head is slightly broader than long (incl. antennal socket) and high (figs. 3—4). Antennal socket broadest anteriorly and half as broad as head. Its frontal edge curved seen from above and the tapered lateral parts ending well below the antennae. Second antennal segment, small, obliquely ring-shaped, its length shorter than widest diameter. Further parts of antennae lacking in the specimen apart from the scapes, which are broad at the distal curvature (fig. 3).

Thorax and abdomen are generally as in the other species of the genus and it seems unnecessary to present a lengthy description. The approximate dimensions can be measured from figs. 1 and 2 showing the specimen in moist condition, probably as in life; in dry condition shrinking disfigures the body extensively. The relative lengths in mid-line of pronotum, meso- and metathorax, first abdominal tergite, and the remainder of abdomen are approximately 5:5:9:9:32. First abdominal tergite nearly quadratic. Wings are about 2.6 times longer than broad: their weak venation is shown in fig. 2. Legs are long and slender; comparison of their different components can be made from fig. 2.

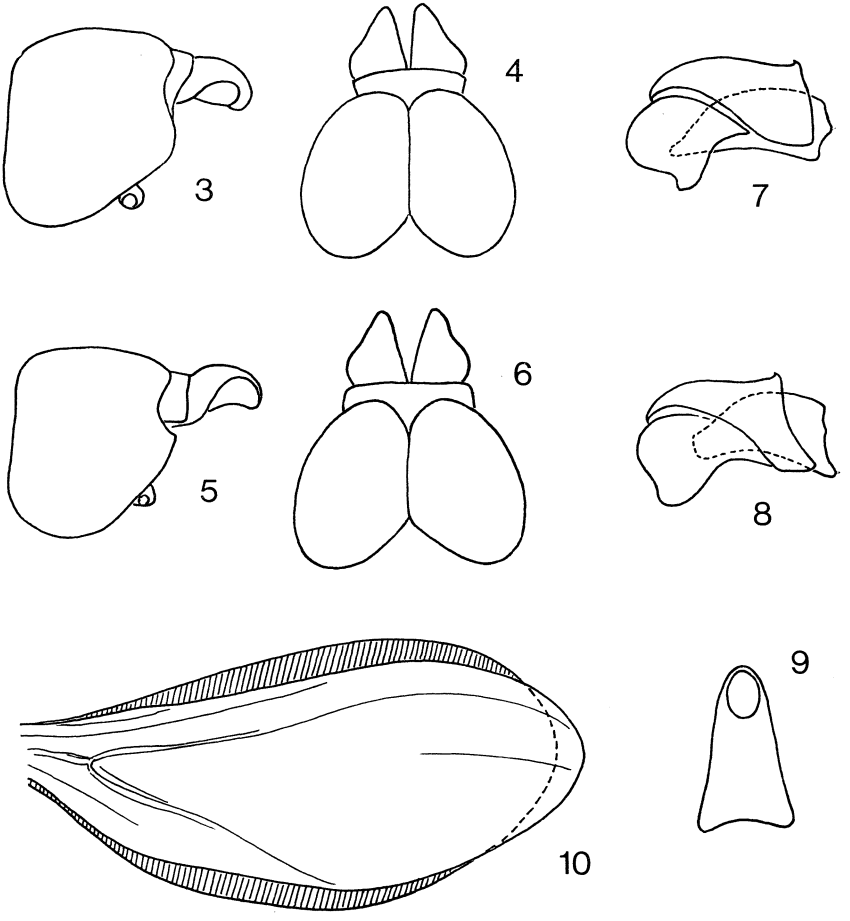
Aedeagus is shown in fig. 7. In lateral view, penis is bluntly pointed distally; in dorsal view it is as in fig. 9, with a large oval apical orifice lying dorsally before apex. Basal piece of tegmen with rather broad lateral flanges; parameres well marked off from basal piece, their lower distal corner triangularly pointed.

F e m a l e unknown.

R e l a t i o n s h i p :

Direct comparison of specimens shows evidently that *lemkaminensis* n. sp. is very similar to the only other species of the genus, *arcuaticornis* Pic. *F. lemkaminensis* is a slightly more slender insect than *arcuaticornis,* with narrower wings and thinner legs. Wings are compared in fig. 10; *arcuaticornis* has a larger anal area but especially the broader area before radius constitutes the difference. The differences in the thickness of legs in the two species may be illustrated by the ratio between the largest width

and the length of the femora (measured ventrally from trochanter to apex); they are in femur I, II and III respectively 1:4.1, 1:5.0 and 1:5.9 in *lemkaminensis* but 1:3.1, 1:3.7 and 1:4.3 in *arcuati-*



Figs. 3—6. Lateral and dorsal view of head of (3—4) *Falsorhipidius lemkaminensis* n. sp. and (5—6) *F. arcuaticornis* Pic. Figs. 7—8. Aedeagus of (7) *F. lemkaminensis* n. sp. and (8) *F. arcuaticornis* Pic. Fig. 9. Penis seen from above of *F. lemkaminensis* n. sp. Fig. 10. Comparison of the outline of the wings of *F. arcuaticornis* Pic and *F. lemkaminensis* n. sp. (the narrow wing).

cornis. The actual lengths are almost the same in the two specimens examined. Differences in shape of the head are rather intangible, but may be seen from figs. 3—6; important is the

difference in the shape of the antennal sockets, especially in lateral view: in *lemkaminensis* (fig. 4) the lateral parts are long and tapering in contrary to short and evenly broad parts in *arcuaticornis* (fig. 6). In aedeagus the best differences lay in the shape of penis and in the form of the lower posterior lobe of the parameres. The apex of penis is bluntly pointed in *lemkaminensis* but broadly truncate in *arcuaticornis,* and lower lobe of parameres is triangularly pointed in *lemkaminensis* in contrary to evenly curved lobes in *arcuaticornis.*

Summary.

A specimen from New Ireland is considered to belong to a new species of *Falsorhipidius* (Rhipidiinae), being the second species of this highly specialized genus formerly only known from Tonkin. An examination of a syntype of the type species *F. arcuaticornis* Pic is the occasion of some comments on the genus.

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Entomologiske Meddelelser 35 (1967)

(Noona Dan Papers No. 58.)

Aphids from the Philippines and the Bismarck Islands, with Description of a New Species of Greenideoida.

By
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The aphids collected by the Noona Dan Expedition 1961—62 in the Philippines and the Bismarck Islands (Petersen 1966) belong to 12 species distributed over 28 samples. Each sample usually consists of 1, seldom 2—3 specimens, collected by sweeping or trapping. Only two samples comprise entire colonies taken directly from host plants. Two of the twelve species, therefore, are represented by numerous specimens, whereas the remaining 10 species include only 29 specimens.

All the adult specimens are viviparous females in accordance with the fact that sexual morphs of aphids are rare in the tropics.

Six of the species are cosmopolitan or at least distributed over several continents, three species are East Asian, one species *(Hysteroneura setariae)* is American, but recently introduced into Africa and Asia, one species is indeterminable, because only immature individuals are present, and one species *(Greenideoida noonadanae* n. sp.) is known only from the Philippines. Information about the distribution of the individual species in the surrounding parts of the world has been borrowed from Cottier (1953), Eastop (1961, 1966, and i.l.), Essig (1956), van der Goot (1917), Hille Ris Lambers (i.l.), Hughes et al. (1964), Martyn & Miller (1963), Boonsom Meksongsee (Thailand, i.l.), Takahashi (several papers), and Zimmerman (1948).

I am indebted to Dr. Børge Petersen, Zoological Museum, Copenhagen, for letting me examine this material, to Dr. D. Hille Ris Lambers, Bennekom, Netherlands, for loan of material and for determination of *Uromelan orientalis* and *Sitobion smilacifolium*

to Dr. V. F. Eastop, British Museum, London, for loan of specimens and information concerning the recent distribution of *Hysteroneura setariae,* and to Dr. C. Watanabe and Mr. M. Miyazaki, Sapporo, Japan, for loan of specimens from the Takahashi Collection.

The material from the Noona Dan Expedition belongs to Zoological Museum, Copenhagen.

APHIDIDAE.

Aphis gossypii Glover.

Philippines. — MINDANAO: Sapamoro, Curuan district, 16.XII. 1961, 1 al.; 20.XII.1961, several apt., juv., nymphs, from *Callicarpa basilanensis* Merr. (Verbenaceae); 22.XII.1961, 1 al.

Bismarck Islands. — NEW BRITAIN: Valoka, 7.VII.1962, 1 al.

Distribution: Philippines, New Britain, New Guinea, Solomon Islands, Hawaii, Micronesia, Fiji, New Hebrides, New Zealand, Australia, Tasmania, Indonesia, Thailand, Malaya, Burma, China, Formosa, Ceylon, and all over the world (cosmopolitan).

Aphis nerii Boyer de Fonscolombe.

Bismarck Islands. — MANUS: Lorengau, 24.VI.1962, several apt. and juv. from *Asclepias curassavica* L.

Distribution: Solomon Islands, Micronesia, Fiji, New Hebrides, New Zealand, Australia, Tasmania, Indonesia, Thailand, Malaya, Formosa, West Asia, Africa, South Europe, U.S.A.

Brachycaudus helichrysi (Kaltenbach).

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 23.IX.1961, 1 al.

Distribution: Philippines, New Guinea, Hawaii, New Zealand, Australia, Tasmania, Indonesia, Formosa, and all over the world (cosmopolitan).

Cavariella araliae Takahashi.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 22.IX.1961, 2 nymphs with wing pads.

Distribution: China, Japan, Formosa, Philippines.

The identification is based on the key in Takahashi (1961) and certified by comparison with slides from Japan including nymphs with wing pads.

Dactynotus (Uromelan) orientalis (van der Goot).

Philippines. — TAWI TAWI: Tarawakan, 20.X.1961, 1 apt. (Hille Ris Lambers det.).

Distribution: Indonesia, Philippines.

Hysteroneura setariae (Thomas).

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 24.IX.1961, 1 al. — BALABAC: Dalawan Bay, 8.X.1961, 1 al.

Distribution: The species originates from America, but has been introduced to the Old World. It has been recorded from Africa by Eastop (1961). Eastop (i.l.) says that it has been widely distributed recently, probably by military planes during and after the war 1939—45, and has been collected in Hong Kong, Malaya, Philippine Islands, Savah, Solomon Islands, and other Pacific islands, including Fiji.

Macrosiphum (Sitobion) smilacifolium Takahashi.

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 1.IX.1961, 1 apt. (Hille Ris Lambers det.); 7.IX.1961, 1 apt.

Distribution: Japan, Formosa, Philippines.

Macrosiphum (Sitobion) sp.

Philippines. — MINDANAO: Sapamoro, Curuan district, 16.XII. 1961, 3 juv.

Bismarck Islands. — NEW BRITAIN: Yalom, 1000 m, 9.V.1962, 1 nymph.

These specimens possibly belong to *smilacifolium* Tak. They cannot be definitely identified because they are immature.

Myzus (Nectarosiphon) persicae (Sulzer).

Philippines. — TAWI TAWI: Tarawakan, 7.XI.1961, 1 al.

Distribution: New Britain, Hawaii, Micronesia, Fiji, New Zealand, Australia, Tasmania, Indonesia, Thailand, Malaya, Formosa, China, Ceylon, India, and all over the world (cosmopolitan).

Rhopalosiphum maidis (Fitch).

Philippines. — TAWI TAWI: Tarawakan, 12.XI.1961, 1 al. Caught by Mercury-light 6^{00}—11^{30} p.m. in the evening.

Distribution: Philippines, Solomon Islands, New Britain,

New Guinea, Hawaii, Micronesia, Fiji, New Zealand, Australia, Tasmania, Indonesia, Malaya, Ceylon, India, Japan, and all over the world (cosmopolitan).

GREENIDEIDAE.

Greenideoida noonadanae n. sp.

Philippines. — BALABAC: Dalawan Bay, 8.X.1961, 1 al., holotype, in the Zoological Museum Copenhagen as Noona Dan Aphidoidea no. 18.

Description. Alate viviparous female (fig. 1—2):

Colours in life unknown. Colours of mounted specimen: Pale

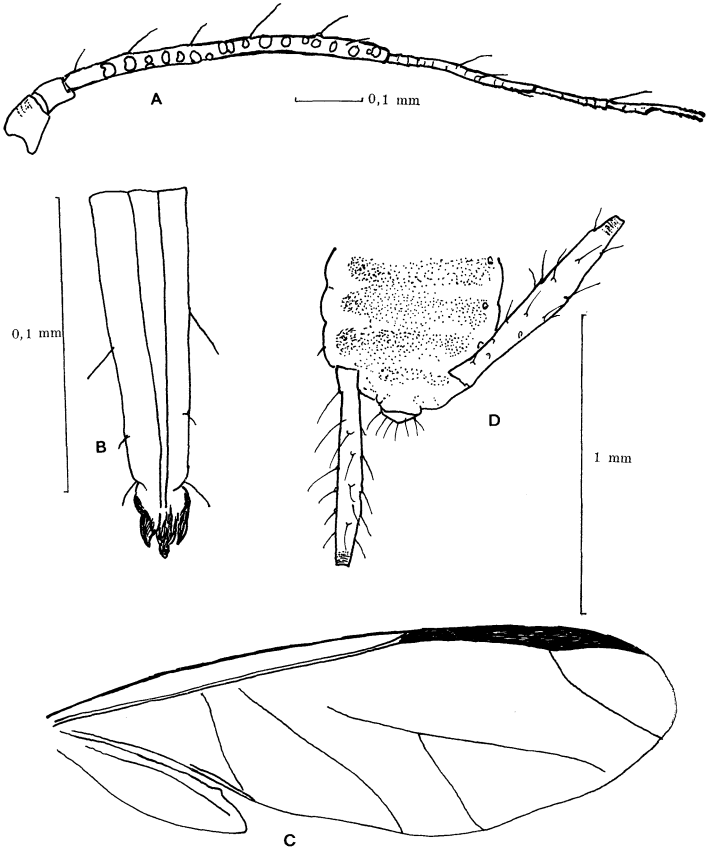

Fig. 1. *Greenideoida noonadanae* n. sp. Alate viviparous female. A) Antenna. B) Apical segment of rostrum. C) Wings. D) Posterior part of dorsum with siphunculi.

yellowish with brownish surroundings of the ocelli and brownish transverse bands on abdominal segments III—VII, those on IV—VI being fused. Brownish antennae. Brown siphunculi. Legs pale.

Body 1,56 mm long. Longest hair on anterior abdominal tergites about 1,8 times as long as basal diameter of IIIrd antennal segment. Width of head across eyes 0,37 mm. Frontal hairs about 0,06 mm long. Lateral frontal tubercles poorly developed. Eyes large with prominent ocular tubercles. Antenna of 5 segments; lengths of the segments in mm: I 0,09, II 0,07, III 0,60, IV 0,25,

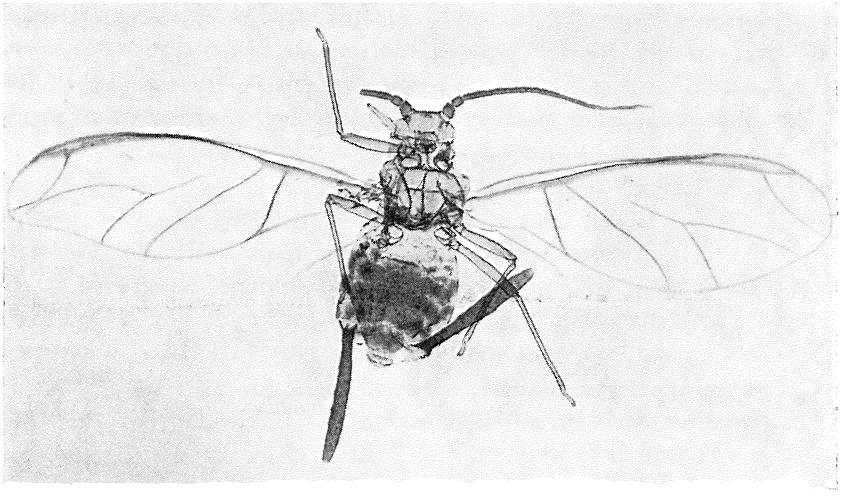

Fig. 2. *Greenideoida noonadanae* n. sp. Alate viviparous female. Natural size 1,56 mm.

Va 0,22, and Vb more than 0,09 (broken); IVth segment considerably thinner than IIIrd segment, and the base of Vth segment is very thin, too; 5—6 long hairs on the inner (frontal) side of IIIrd segment, about 4 times as long as basal diameter of that segment, IVth segment with 3 hairs, and base of Vth segment with 1 hair; IIIrd segment with 18 transversely oval secondary rhinaria over the entire length. Rostrum reaches to about 3rd coxae; apical segment (IV+V) slender and 0,12 (0,10 + 0,02) mm long or 1,3—1,4 times as long as 2nd segment of hind tarsus (0,09 mm), with 6—8 very pale, nearly invisible hairs. Fore wing 2,2 mm long; media with one fork. Hind wing reduced in size, about 0,7 mm long, without obliques. Legs slender. Siphunculus 0,81 mm or

about half as long as the body or 8 times the maximum width, with the largest diameter a little distally to the middle; the basal third is narrower than the rest, down to 0,06 mm, except the apex, which is only 0,04 wide and without flange, whereas the width is largest about 2/5 from the apex, 0,10 mm or about 3 times the diameter of hind tibia in the middle (0,03 mm); covered with up to about 0,12 mm long bristles of uniform type and with normal acute apices, evenly distributed; without reticulation, but near apex covered with spinules in transverse rows. Cauda rounded triangular.

Notes: The wing venation, the presence of 5 antennal segments, and the absence of reticulation on siphunculi show the affinity with *Greenideoida elongata* van der Goot (cf. the key in Ray Chaudhuri 1956, p. 66—67), from which it differs, however, by having shorter siphunculus (0,52 times as long as body compared with 0,76 times in the alate *elongata*) and also thicker siphunculi. I doubt that it is identical with the unknown alate morph of *G. hannae* van der Goot (van der Goot 1917 p. 145, Ray Chaudhuri 1956 p. 101), whose apterous morph has very short siphunculi, only about 0,25 times as long as body, but is said to have numerous long and spiny hairs.

Rostrum is more distinctly five-segmented than in *elongata*. The general appearance of *noonadanae* is much like that of *Eutrichosiphon pasaniae* Okajima (according to description in Ray Chaudhuri 1956 and comparison with specimens from the Takahashi Collection) from which it only differs by having the same reduced type of venation as in *Greenideoida elongata* and by having siphunculi which are not faintly striated or reticulate, though otherwise very similar.

Two alate aphids belonging in British Museum, London, from traps at the Davao Experimental Station, Philippine Islands, labelled *Greenideoida ?hannae* v. d. Goot, 352/63 and 361/63, March 1963, collected by M. R. Gavarra, are — though only with doubt — referred to *noonadanae* n. sp. They differ from the type for instance by having shorter IIIrd antennal segment, fewer rhinaria (8—10), shorter and more hairy siphunculi, and — at least in one specimen (352/63) longer apical segment of rostrum. These differences may be due to a different season of the year or simply normal variation.

Some measurements in mm:

352/63: Body length 1,87, antenna 1,26, III—V 0,48:0,26:(0,22+0,16), siph. 0,71, apic. rostr. segm. 0,16, 2nd segm. hind tars. 0,09.

361/63: Body 1,80, antenna 1,01, III— V 0,41:0,19:(0,14+0,14), siph. 0,59.

PEMPHIGIDAE.

Tetraneura nigriabdominalis (Sasaki) (= *hirsuta* Baker).

(For synonymy: See Tanaka 1961).

Philippines. — PALAWAN: Mantalingajan, Pinigisan, 600 m, 7.IX.1961, 2 al. — MINDANAO: Sapamoro, Curuan district, 16. XII.1961, 3 al.; 20.XII.1961, 1 al.; 22.XII.1961, 3 al.

Bismarck Islands. — NEW BRITAIN: Kwalalessi, 3.VII.1962, 1 al.

Distribution: This species or complex of species is widespread in old world tropics and subtropics. According to Tanaka and others it occurs in Micronesia, Australia, Japan, Formosa, Philippines, China, India, Ceylon (Judenko & Eastop 1963), Africa, Yugoslavia (Tanasijevic & Eastop 1963, but not Eastop 1966), Jamaica, and U.S.A. Eastop (1966) does not mention U.S.A., but adds Malaya and New Guinea.

Summary.

Eleven aphid species, collected by the Noona Dan Expedition, are recorded from the Philippines (10 species) and the Bismarck Islands (4 species). Six of the species are distributed over several continents, three species are East Asian, one species *(Hysteroneura setariae)* is American, but recently introduced into Africa and Asia, and one species (*Greenideoidea noonadanae* n. sp.) is described from the Philippines (Balabac I.).

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Erection of a New Family in the Lepidopterous Suborder Dacnonypha.

By
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The homoneurous moth genus *Agathiphaga* was described by Dumbleton in 1952. The genus comprises two species, occuring in Queensland (Australia) and on Fiji, respectively; the larvae of both feed in the seeds of Kauri pines (Agathis). The adult anatomy indicated affinities to both Micropterygidae and Eriocraniidae; Dumbleton decided however, that the weight of evidence was for considering *Agathiphaga* as a specialized genus of Micropterygidae. On the other hand Hinton (1958) after examining the *Agathiphaga*-larvae found these to possess several apomorph characters characteristic of Dacnonypha and higher Lepidoptera and to be devoid of any of the features characteristic of the Micropterygid larvae. He therefore concluded that the genus belongs to the Eriocraniidae or a closely related family. The correctness of the transferring of *Agathiphaga* to the suborder Dacnonypha cannot be doubted; however, in the adult anatomy the genus differs from the Eriocraniidae as well as from the other dacnonyphous families (Mnesarchaeidae, Neopseustidae) in many important features, and consequently has to be regarded as constituting a separate family, which is defined below.

Agathiphagidae fam. nov.

Type-genus: *Agathiphaga* Dumbleton, 1952.

D i a g n o s i s. Adult: Articulated mandibles present, galeae not haustellate, lobular lacinia present, tibia 2 *and* 3 with paired subapical and apical spurs, forewing with closed cell between M and Cu, ♂-genitalia with long and simple, dorsally curved valvae, phallus with short posteriorly directed ventral apodeme.

In these characters the family differs from all other Dacnonypha.

Supplementary description. Adult: Ocelli absent, compound eyes relatively small (diameter about half the height of headcapsule), mid-cranical sulcus long (reaching level of antennal sockets, labrum unreduced, apical labial palp segment with sensory pit, hypopharynx a rather broad lobe with dorsal salivary opening, closed cell between Rs-branches in both wingpairs, jugofrenate wing-coupling, ♂ sternum V with paired processes containing openings from glands, ♂-genitalia with anterior margin of segment IX laterally produced as apodemes which almost reach the anterior limit of segment VIII, tergum IX forming two lateral lobes, ♀-terminalia eversible.

The presence of dorsal tentorial arms could not be demonstrated in the existing material. The posterior parts of the anterior tentorial arms are much reduced, not discernible; posterior arms and corporotentorium are well developed (Dumbleton, pers. communication).

The labial palp is stated to be 4-segmented. This also is the case in a few species of *Sabatinca* (Micropterygidae). However, as 3 segments in the labial palp certainly is the primitive number in insects and as generally in the suborders Zeugloptera and Dacnonypha the prementum is laterally shaped very much like a palp segment it seems likely that the basal "segment" in these cases is actually a part of the prementum (a study of the musculature is needed to elucidate this point).

The pupae are decticous, exarate.

The larva are devoid of legs and prolegs.

For illustrations and further details of all stages see the original description by Dumbleton (1952).

Systematic relationships. The Agathiphagidae is the most overall primitive dacnonyphous family; this is particularly evident in the structure of the mouthparts, which apart from the absence of glossae and paraglossae are very similar to the generalized type found in the suborder Zeugloptera. The presence of distinct anterior and posterior mandibular articulations makes it unlikely that the unspecialized state of the galea is due to secondary reduction.

Amongst the dacnonyphous families the Agathiphagidae seem to be most similar and consequently most genetically related to

the Eriocraniidae. Phylogenetically, however, they are not more closely related to this family than to the remaining families since the similarities in question are symplesiomorphies. Agathiphagid features retained in Eriocraniidae include e.g. the relatively small and ventrally situated compound eyes, the shape of the labrum and the maxillary palp (especially the condition in the australian species, *A. queenslandensis),* the presence of a sensory pit on the apical labial palp segment, the closed Rs-cell in the hind wing (in Eriocraniidae this feature is only retained in the genus *Acanthopteroctetes* Braun, 1921), the processes on sternum V in ♂ and the eversible female terminalia. The reduction of the posterior part of the anterior tentorial arms is a peculiar feature also found in the Eriocrannid genera *Dyseriocrania* and *Eriocrania;* however, this similarity has to be considered a convergence rather then a synapomorphy since the anterior tentorial arms are fully developed in the genus *Heringocrania* (Kristensen 1968 a).

The family Mnesarchaeidae is considered (Kristensen 1968 b) to be a specialized group derived from an Eriocraniidae-like ancestor. Consequently it shows less overall similarity to the Agathiphagidae than does the Eriocraniidae. The family Neopseustidae, which probably is the sister-group of the Mnesarchaeidae is anatomically rather isolated amongst recent Dacnonypha. The absence of ocelli in Agathiphagidae and Mnesarchaeidae-Neopseustidae is in all probability due to convergence (the ocelli have been independently lost in several other lepidopterous families).

The diagram (Fig. 1) illustrates the author's present view on the phylogenetic interrelationships of the dacnonyphous families. Important apomorph characters of each monophyletic group are indicated.

Practical key to the families of the lepidopterous suborders Zeugloptera and Dacnonypha.

1 Mandibles with distinct articulations; galeae unspecialized; lacinia lobe-like 2
Mandibles without distinct articulations, sometimes very reduced; galeae long, haustellate; lacinia vestigial or absent 3

2 Ocelli present; tibia 2 without spurs ..... *Micropterygidae* (Zeugloptera)
Ocelli absent; tibia 2 with paired apical and subapical spurs ..... *Agathiphagidae* (Dacnonypha)

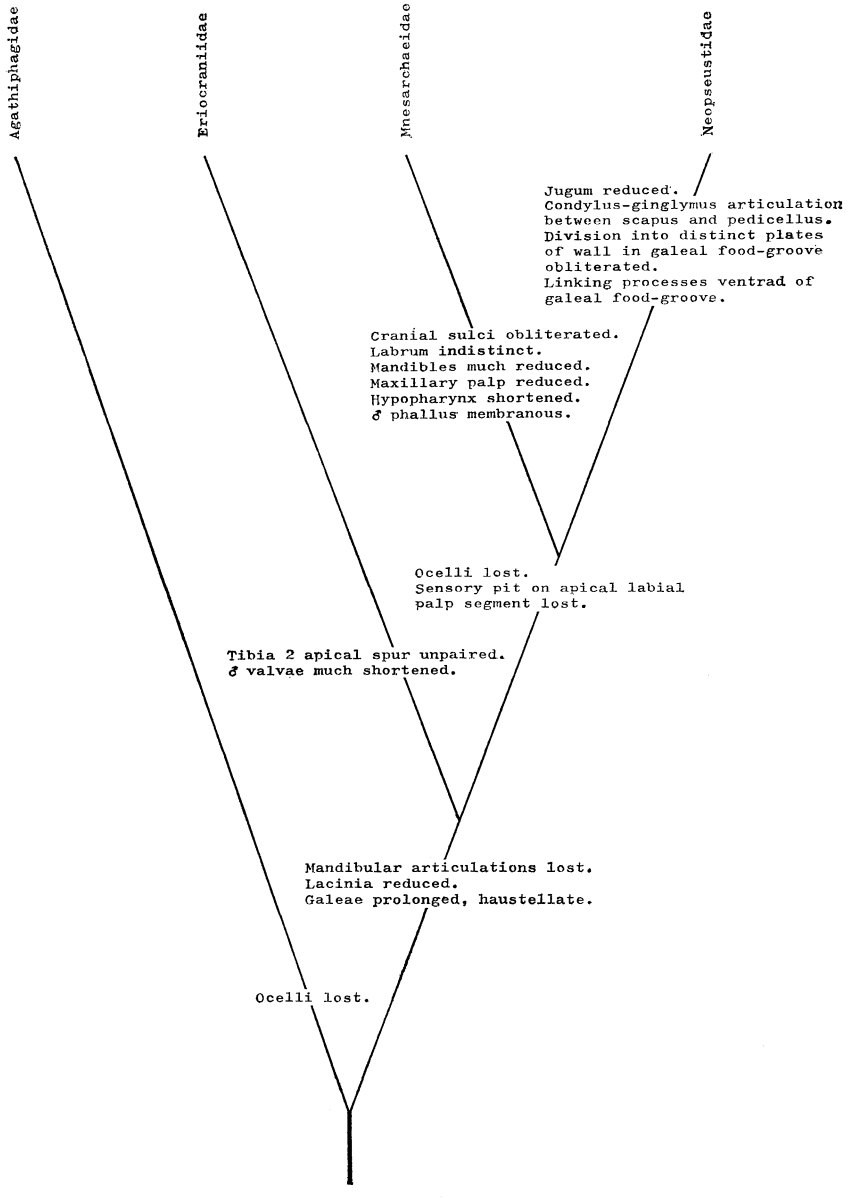

Fig. 1. Probable phylogenetic interrelationships of the dacnonyphous families. At present the Neopseustidae can be placed tentatively only.

3 Ocelli present; tibia 2 with unpaired apical spur .....
..... *Eriocraniidae* (Dacnonypha)
Ocelli absent; tibia 2 with paired apical spurs 4
4 Maxillary palp long, 5-segmented; jugum reduced .....
..... *Neopseustidae* (Dacnonypha)
Maxillary palp short, 3-segmented; jugum well-developed .....
..... *Mnesarchaeidae* (Dacnonypha)

Note. In the keys of Viette (1947) and Brues, Melander & Carpenter (1954) the Mnesarchaeidae are said to be devoid of spurs on tibia 3 contrary to the Neopseustidae. However, in *Mnesarchaea hamadelpha* the present author found paired spurs to be present on tibia 3.

Acknowledgment. I wish to express my sincere gratitude to Mr L. J. Dumbleton, Christchurch, New Zealand, for his generous help in the preparation of this paper.

Summary.

The new family Agathiphagidae in the lepidopterous suborder *Dacnonypha* is erected on the basis of the genus *Agathiphaga* Dumbleton, 1952.

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A Note on Chapmania kaltenbachi sensu Hering 1932 (Lep., Eriocraniidae).

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In 1951 Bradley showed that the specimens constituting the type-series of *Eriocrania kaltenbachii* Wood, 1890 (nec. Stainton) were identical with *Heringocrania* (*Eriocrania* auct.) *chrysolepidella* (Zeller, 1851). In the key of Hering (1932), however, the species *chrysolepidella* Zeller and *kaltenbachi* (sic) Wood were arranged in the genera *Eriocrania* and *Chapmania,* respectively; the two genera were separated by differences in the number of Rs-branches and the presence or absence of a secondary cell in the fore wing. (The names *Eriocrania* and *Chapmania* sensu Hering have later been replaced by *Heringocrania* and *Eriocrania,* respectively; for the generic nomenclature of Eriocraniidae see Viette 1951). Consequently it seemed likely that the specimens from the Rhine-province called *kaltenbachi* by the late prof. Hering belonged to an unnamed species of *Eriocrania.*

On my request to the Humboldt Museum in Berlin concerning the above-mentioned specimens, dr. H. J. Hannemann kindly answered that the material in question was very small indeed. A ♂ and a ♀ labelled "Reingau" were lent me for examination. These specimens seem in no way to differ from the common species *Eriocrania haworthi* Bradley, 1966 (*purpurella* auct., *rubroaurella* auct.). As it is characteristic in that species the 5th segment of the maxillary palp is apically forked (Kristensen 1968) the scales of the hind wing are rather narrow and parallel-sided but not hair-shaped (Viette 1948). The ♂-genitalia (fig. 1) have the outline of segment IX, uncus, valvae and phallic armature identical with those of *E. haworthi;* the ♀-genitalia also agree with those of *E. haworthi.* The differences in antennal length and wing-shape mentioned by Hering were not found to exist;

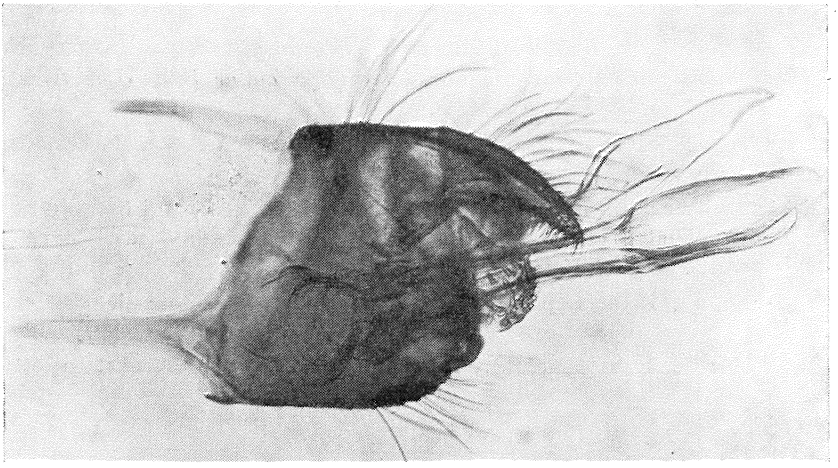

Fig. 1. *Eriocrania haworthi* Bradley. ♂-genitalia. Rheingau. Coll. Humboldt Mus. Berlin. Genit. no. 568. N. P. Kristensen.

e.g. the antennae of both *E. haworthi* and the Reingau-specimens are somewhat shorter than half the length of the forewing. The larvae of the animals called *kaltenbachi* by Hering were said to mine in leaves of Corylus, which is the food-plant of *H. chrysolepidella*. However, the specimens examined by me have originally been labelled *"unimaculella"*, i.e. they have been confused with a species which is Betula-feeding like *E. haworthi*. Thus there is no reason to believe that these specimens were found associated with Corylus; Hering's information on the food-plant certainly has merely been taken from the British literature concerning *kaltenbachii* Wood.

Consequently the synonymy between *Chapmania kaltenbachi* sensu Hering 1932 and *Eriocrania haworthi* Bradley, 1966 appears established.

A c k n o w l e d g m e n t. I wish to express my sincere gratitude to dr. H. J. Hannemann, Berlin, for his kind cooperation in the preparation of this note.

Summary.

The Eriocraniid called *Chapmannia kaltenbachi* Wood by Hering (1932) is found to be identical with *Eriocrania haworthi* Bradley, 1966.

References.

Bradley, J. D., 1951: Micropteryx kaltenbachii Wood 1890 synonymous with Eriocrania chrysolepidella Zeller 1851 (Lep. Eriocraniidae). — Entom., 84: 9.

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Kristensen, N. P., 1968: The anatomy of the head and the alimentary canal of adult Eriocraniidae (Lep., Dacnonypha). — Ent. Meddr.. 36 (in press).

Viette, P., 1948: Lepidopteres Homoneures. — Faune de France, 49.

—, 1951: Sur la nomenclature des Eriocraniidae. Rev. franc. Lep., 13: 43—44.

Nye fund af sjældne biller (Coleoptera) i Danmark.

Af
Ole Jensen
Heibergvej 12, Grejsdalen, Vejle.

Nedennævnte fund af sjældne biller har jeg ment kunne være af interesse. Sidetallet i parentes efter artsnavnet henviser til Victor Hansens fortegnelse over Danmarks biller i Ent. Meddr. bind 33, 1964.

Trechus micros Hbst. (p. 22): 1 eksemplar Grejsdalen ved Vejle 20. august 1967. Eksemplaret fangede jeg i min have på fugtig muldet bund, hvor der var vandrottegange.

Arten er kendt fra Jylland og øerne, men er sjælden, og hyppigst fundet i vandrottens eller muldvarpens reder og gange.

Trechus discus F. (p. 22): I antal bl. a. 26. juli 1967 i Grejsdalen ved Vejle. Arten er her ret talrig — men meget lokal — i en grusgrav, men hvor overfladeleret endnu ikke er fjernet. Dyrene findes navnlig under de store blade af Tussilago, hvor disse ligger ret fast på leret — bl. a. sammen med *Asaphidion pallipes, Bembidion bruxellense* og *Bembidion lampros.*

Acupalpus dubius Schilsky (p. 30): 4 eksemplarer Svejbæk 11. april 1964. Eksemplarerne sigtede jeg af meget fugtigt mos i en gammel tørvegrav.

Amara majuscula Chaud. (p. 35): 1 eksemplar Saltuna, Bornholm, 22. juli 1964 på ultraviolet lys.

Pterostichus angustatus Dft. (p. 37): 4 eksemplarer Bredballe ved Vejle 2. oktober 1966. Dyrene fangede jeg under grene og mos på et ryddet skovareal, som året i forvejen var blevet afbrændt.

Demetrias imperialis Germ. (p. 44): 1 eksemplar Ølene, Born-

holm, 17. juli 1964. Eksemplaret sigtede jeg ved roden af Phragmites communis ved søen i Ølene.

Elater sanguineus L. (p. 213): 3 eksemplarer Stensbæk plantage 3. juni 1962. Alle 3 eksemplarer fundet i en på jorden liggende rødmuldet fyrregren. Ny for Jylland.

Yderst sjælden. Kun kendt i 3, for mindst 100 år siden fundne eksemplarer, 1 fra Hørsholm og 2 fra Gribskov.

Elater erythrogonus Müll. (p. 214): 1 eksemplar Draved skov 24. maj 1964. Eksemplaret fandt jeg i den øverste tørre del af en rødmuldet ellestub sammen med mange *Elater nigrinus*.

Meget sjælden og kun fundet i nogle få eksemplarer i Vang og Bjørum skove i Vendsyssel i rødmuldede egestubbe.

Typhoeus typhoeus L. (p. 327): 1 eksemplar Rom hede ved Lemvig 23. maj 1963. Eksemplaret blev fanget krybende på jorden — men der var får i nærheden.

Cryptocephalus decemmaculatus L. var. **bothnicus** L. (p. 361): 2 eksemplarer Svanemose ved Kolding 5. juli 1964 og 18. juli 1967. Begge eksemplarer banket af birk i stille, varmt solskinsvejr sidst på eftermiddagen. Hovedformen har jeg også ledt efter på samme lokalitet, men ikke kunnet finde.

Chrysomela quadrigemina Suffr. (p. 364): 1 eksemplar Svejbæk ved Silkeborg 1. november 1964. Eksemplaret sigtede jeg af mos på en sandet med lyng og mos bevokset bakke.

Cossonus parallelepipedus Hbst. (p. 411): 1 eksemplar Bredballe ved Vejle 8. juni 1966. Eksemplaret fangede jeg om aftenen i stille, lunt vejr siddende på min buksebag!

Summary.

New findings of twelve Danish species of Coleoptera are recorded. The species are all very rare in Denmark.

Oversigt over Entomologisk Forenings møder og excursioner 1966-1967.

Møder.

12. okt. 1966. Professor, dr. phil. Fr. J. Mathiesen talte om: Nogle som vårfluelarverør bestemte forsteninger fra det danske og grønlandske tertiær. Med lysbilleder. Diskussion: Anker Nielsen, O. Bakkendorf og Bo Vest Pedersen. 16 medlemmer til stede.

Som nye medlemmer proponeredes Erik Sandersen, Karsten Secher, Ingvar Rydh og Per Lindskog.

19. okt. Klubaften. 9 medlemmer til stede.

26. okt. Lic. agro Ove Behrendt talte om: Kemikalieresistens hos insekter og mider. Diskussion: Anker Nielsen, O. Bakkendorf, G. Kristensen og J. Keiding. 30 medlemmer til stede.

29. okt. Foreningens medlemmer var af Entomologiska Sälskapet i Lund inviteret til et fællesmøde på Zoologiska Institutionen i Lund, hvor professor dr. Carl H. Lindroth talte om: Kolonisering av nytt land. Undersökninger på Surtsey vid Island.

2. nov. Klubaften. 14 medlemmer til stede.

9. nov. Afdelingsbestyrer, lic. agro K. B. Lindhart og lektor B. Bejer-Petersen talte om: henholdsvis landbrugets og skovbrugets skadedyr i 1966. 29 medlemmer til stede.

16. nov. Klubaften. 10 medlemmer til stede.

23. nov. Dr. Bjørn Petersen, Malmø talte om: Industrimelanism, en evolutionsprocess i våra dagar. Med lysbilleder og film. Diskussion: N. L. Wolff, W. van Deurs, Børge Petersen, O. Bakkendorf, Ib Norgaard, N. Møller Andersen, Anker Nielsen, J. Dan Petersen og J. E. Jelnes. 11 gæster og 40 medlemmer til stede.

30. nov. Klubaften. 4 medlemmer til stede.

Som nyt medlem proponeredes Anders Lewin, Sverige.

7. dec. Dr. phil. A. M. Hemmingsen talte om en entomologisk undersøgelsesrejse til Sydamerika, særlig Argentina. Med lysbilleder og demonstration af indsamlet materiale. 31 medlemmer til stede.

25. jan. 1967. Dr. phil. Anker Nielsen causerede over nyere litteratur om insekters adfærd. Diskussion: Axel Michelsen, N. Haarløv. A. M. Hemmingsen, Børge Petersen og O. Bakkendorf. 36 medlemmer til stede.

1. feb. Klubaften. 11 medlemmer til stede.
Som nyt medlem proponeredes Sigurd Jørgensen.

8. feb. Klubaften. 10 medlemmer til stede.
Som nye medlemmer proponeredes Thomas Dohn og Finn Skou Pedersen.

15. feb. Der vistes farvetonefilm af æblebladlusens, kålfluens, æbleviklerens og jordloppens biologi. Diskussion: Anker Nielsen, Jørgen Jørgensen og O. Bakkendorf. 48 medlemmer til stede.
Efter mødet fejredes foreningens 99. fødselsdag på sædvanlig måde.
Som nyt medlem proponeredes Finn Verner Nielsen.

1. marts. Seminarielektor, cand. mag. Ole Heie talte om: Bladlus i rav. Diskussion: Anker Nielsen, O. Bakkendorf, Børge Petersen, Jørgen Jørgensen og Leif Lyneborg. 24 medlemmer til stede.
Som nye medlemmer proponeredes Mikael Münster-Swendsen, Asger Dirksen og Karen Hammer.

8. marts. Klubaften. 12 medlemmer til stede.

15. marts. Meddelelser om fund af nye og sjældne sommerfugle i 1966 blev givet af N. L. Wolff, J. Lundqvist, H. K. Jensen, W. van Deurs, Preb. Bjørn, Ole Karsholt, Michael Fibiger, Ib Norgaard og Thyge Thygesen. 34 medlemmer til stede.

29. marts. Meddelelser om fund af biller og andre insekter (undtagen sommerfugle) i 1967 blev givet af Victor Hansen, F. Bangsholt, H. Gønget, Anker Nielsen, Ib Kornerup, Friis-Jensen, Nils Møller Andersen. 29 medlemmer til stede.

5. april. Klubaften. 15 medlemmer til stede.

12. april. Auktion over afdøde overlærer Johs. Petersen og ingeniør E. Suensons bøger, tidsskrifter, særtryk og samlerekvisitter. 41 medlemmer til stede.

26. april. Ordinær generalforsamling. — 1. Højesteretsdommer Victor Hansen valgtes til dirigent. — 2. Formanden aflagde beretning. Der var afholdt 11 møder med gennemsnitligt 34 deltagere, 8 klubaftener med gennemsnitligt 11 deltagere og 2 excursioner med gennemsnitligt 22 deltagere. — 3. Kassereren forelagde de reviderede regnskaber for foreningen og fondene — enstemmig godkendelse og decharge. — 4. Det bestemtes, at renterne af Entomologisk Fond henlagdes til Kongresfondet og til Entomologisk Fond med halvdelen til hvert. — 5. Børge Petersen genvalgtes som redaktør og O. Bakkendorf og Nils Møller Andersen genvalgtes som øvrige bestyrelsesmedlemmer. — 6. O. Schaltz og W. van Deurs genvalgtes som revisorer og Friis-Jensen som revisorsuppleant. — 7. Redaktøren redegjorde for planerne om et fællesnordisk tidsskrift med "internationalt" indhold. Ved afstemning blev det vedtaget at overlade bestyrelsen at nedsætte et udvalg, der nærmere skulle behandle sagen og følge dens udvikling. — Ingen ønskede ordet til eventuelt. 29 medlemmer var til stede.

Efter generalforsamlingen talte dr. phil. S. L. Tuxen om sit ophold i Californien (med lysbilleder).

Excursioner.

28. juni 1967. Excursion til Frederikslund skov og Vaserne ved Furesøen vest for Rudersdal. N. L. Wolff og Preben Bjørn demonstrerede lyslokningsapparatur. 24 deltagere.

24. sept. 1967. Excursion til Holte Furesøpark. Emne: Ferskvandsinsekter. Lektor, dr. phil. Anker Nielsen var leder. 35 deltagere, heraf 11 gæster.

Regnskab for Entomologisk Forening 1966.

Indtægt

Kassebeholdning pr. $^{1}/_{1}$ 1966	kr.	6.308,55
Renter (legat 200,00, bank 56,72, giro 55,04)	-	311,76
Kontingenter	-	6.946,50
Statstilskud	-	3.500,00
Rask-Ørsted Fond	-	3.500,00
Statens alm. videnskabs fond (Noona Dan)	-	14.310,00
Salg af hefter og særtryk af Ent. Medd.	-	4.617,56
Diverse, godtgørelse af papirafgift m. m.	-	372,30
	kr.	39.866,67

Udgift

Trykning af Entomologiske Meddelelser	kr.	20.316,55
Trykning af særtryk	-	4.218,25
Meddelelser om møder samt porto	-	4.187,06
Møder og ekskursioner	-	1.938,39
Overført til Kongresfondet	-	3.000,00
Diverse udgifter	-	577,05
Kassebeholdning pr. $^{31}/_{12}$ 1966	-	5.629,37
	kr.	39.866,67

Status.

Aktiver

Girokonto	kr.	10.401,82
Bankkonto	-	949,08
Kontant beholdning	-	434,83
	kr.	11.785,73
Kontingentrestancer	kr.	200,00

Passiver

Tilhørende Kongresfondet m. m.	kr.	4.927,05
„ Entomologisk Fond	-	1.229,31
„ foreningens driftskonto	-	5.629,37
	kr.	11.785,73

Regnskab for Kongresfondet m. m. 1966.

Indtægt

Kassebeholdning pr. $^{1}/_{1}$ 1966	kr.	1.347,50
Overført fra Entomologisk Fond	-	242,95
Overført fra foreningens driftskonto	-	3.000,00
Renter	-	342,00
	kr.	4.932,45

Udgift

Depotafgift	kr.	5,40
Kassebeholdning pr. $^{31}/_{12}$ 1966	-	4.937,05
	kr.	4.932,45

Status.

Aktiver

Obligationsbeholdning nom.	kr.	5.400,00
Kassebeholdning pr. $^{31}/_{12}$ 1966	-	4.927,05
	kr.	10.327,05

Passiver

Kongresfondet m. m.	kr.	10.327,05

Regnskab for Entomologisk Fond 1966.

Indtægt

Kassebeholdning pr. $^{1}/_{1}$ 1966	kr.	975,62
Aktieudbytte	-	2,04
Renter	-	505,00
	kr.	1.482,66

Udgift

Depotafgift		kr.	10,40
Overført til Kongresfondet		-	242,95
Til disposition (253,52 ÷ 10,40)	kr. 243,12		
Fondets kapital tilhørende	- 986,19		
Kassebeholdning pr. $^{31}/_{12}$ 1966	kr. 1.229,31	-	1.229,31
		kr.	1.482,66

Status.

Aktiver

Obligationsbeholdning nom.	kr.	10.300,00
Aktie pålydende	-	20,00
Kassebeholdning pr. $^{31}/_{12}$ 1966	-	1.229,31
	kr.	11.549,31

Passiver

Entomologisk Fond	kr.	11.306,19
Til disposition	-	243,12
	kr.	11.549,31

Regnskab for Oluf Jacobsens Legat 1966.

Indtægt

Renter	kr.	205,00

Udgift

Depotafgift	kr.	5,00
Overført til foreningens driftskonto	-	200,00
	kr.	205,00

Status.

Aktiver

Obligationsbeholdning nom.	kr.	5.000,00

Passiver

Legatet	kr.	5.000,00

Regnskabet revideret og befundet rigtigt. Bank- og girokonti samt kasse- og obligationsbeholdningens tilstedeværelse konstateret.

København, 3. april 1967

O. Schaltz. *Wilhelm van Deurs.*

INDHOLD — CONTENTS.

Afhandlinger: Side

Andersen, N. Møller: A Contribution to the Knowledge of Philippine Semiaquatic Hemiptera-Heteroptera 260
—: The Genus Ptilomera Amyot & Serville in Thailand, with a New Species from the North (Hemiptera, Gerridae) 309
Beier, M.: Die Pseudoscorpione der Noona Dan Expedition nach den Philippinen und Bismarck Inseln 315
Böcher, Jens: The Heteroptera fauna of Korshage, Zealand, in relation to vegetation in late summer 27
Chûjô, Michio: The Erotylidae (Col.) collected by the Noona Dan Expedition in the Philippines and Bismarck Islands 181
van Deurs, Wilhelm: Nye sommerfugle (Lepidoptera) 1966 104
Endrödi, S.: Die Dynastinen, Rutelinen und Hybosorinen der Noona Dan Expedition nach den Philippinen, Bismarck- und Salomon Inseln (Col. Scarabaeidae) 301
Froeschner, Richard C.: The burrower bugs collected by the Noona Dan Expedition mainly in the Philippines and Bismarck Islands (Hemiptera: Cydnidae) 11
Hansen, Victor: Nye danske biller (Coleoptera) 1966 218
Heie, Ole: A List of Danish Aphids 5 125
—: Aphids from the Philippine and the Bismarck Islands, with Description of a New Species of Greenideoida 333
Hurd, Paul, Jr.: The Identity of Megachile rotundata (Fabricius) and M. argentata (Fabricius) (Hymenoptera: Apoidea) 3
Jensen, Ole: Om indsamling af Cryptocephalus biguttatus Scop. (Col., Chrysomelidae) 26
—: Nye fund af sjældne biller (Coleoptera) i Danmark 349
Kormilev, Nicholas A.: Some Aradidae (Hemiptera-Heteroptera) from the Philippine, Bismarck and Solomon Islands 291
Kristensen, N. P.: Erection of a New Family in the Lepidopterous Suborder Dacnonypha 341
—: A Note on Chapmania kaltenbachi sensu Hering 1932 (Lep., Eriocraniidae) 346
Lansbury, I.: Aquatic Hemiptera-Heteroptera of the Noona Dan Expedition to the Philippine and Bismarck Islands 89
Louwerens, C. J.: Philippine Carabidae (Col.) collected by the Noona Dan Expedition 195
Lyneborg, Leif: A new species of Nycterimyia Lichtw. from New Britain (Diptera, Nemestrinidae) 215
Møller, N. Ulrik: Platyptilia tesseradactyla L., ny dansk Fjermøl (Lep., Pterophoridae) 325

Petersen, Børge: A New Species of Falsorhipidius Pic, with Notes on the Genus (Col., Rhipiphoridae) 327
Pont, Adrian: Some Muscidae (Diptera) from the Philippine Islands and the Bismarck Archipelago. 1. The genus Myiophaea Enderlein 105
Ramamurthi, B. N.: Dermaptera collected by the Noona Dan Expedition in the Philippines and Bismarck Islands 227
Rasmussen, Steen: Hylotrupes (Col., Cerambycidae) in dead trees on Fårön, a Swedish island 223
Schedl, Karl E.: Bernsteinborkenkäfer aus dem Zoologischen Museum der Universität Kopenhagen (Col., Scolytoidea) 85
de Sousa Lopes, H.: Some Sarcophagidae (Diptera) from the Bismarck Islands and the Philippines 143
Straneo, S. L.: Deux Pterostichides (Coleopt. Carabidae) nouveaux de Palawan (Philippines) 177
Vanschuytbroeck, P.: Contribution à la connaissance des Celyphidae (Diptera) des Philippines et du Sud-Est asiatique 283
Wolff, Niels L.: Ny dansk vikler, Laspeyresia conicolana Heylaerts (Lep., Tortr.) 23
—: Dansk fund af sommerfuglen Rhyacia (Epipsilia) grisescens F. (Lep.. Noct.) 99

Anmeldelser 87, 98, 142, 193, 308

Entomologisk Forening:
Oversigt over Entomologisk Forenings møder og excursioner 1966—1967 351
Regnskab for Entomologisk Forening etc. 1966 353

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