Pacific Insects Monograph 29: 1-134 20 October 1972

A REVIEW OF THE WORLD GENERA OF MYDAEINAE, WITH A REVISION OF THE SPECIES OF NEW GUINEA AND OCEANIA

(Diptera: Muscidae)[1]

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CONTENTS

1 Research conducted under a grant to Bishop Museum from the U.S. National Institutes of Health (AI-07634). This publication was supported in part by the NIH Grant LM 01659 from the National Library of Medicine.

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Abstract. A key to the 6 subfamilies of Muscidae found in New Guinea and Oceania is given. The subfamily Mydaeinae is described, a key to the 15 world genera definitely referable to the subfamily is presented, and the 7 extralimital genera are defined. One of the latter (*Pseudohelina*, for *Helina phaeoxantha* van Emden and related species from the Ethiopian region) is described as new, and 2 (*Opsolasia* Coquillett and *Afromydaea* Malloch) are resurrected from synonymy.

Descriptions of adults and, where possible, eggs are given for the 61 regional species and 1 Australian species. Keys to adults for all regional genera, and a key to the eggs for the genus *Myospila*, are presented. *Xenosia* Malloch, *Xenosina* Malloch, *Eumyiospila* Malloch, *Helinella* Malloch and *Parapictia* Pont are treated as synonyms of *Myospila*. Four genera and 41 species are described as new. The number of regional species in each genus, and the number described as new, are as follows: *Papuaia* Malloch, 5 spp., 3 new; *Gymnopapuaia* n. gen., 26 spp., 18 new; *Papuaiella* n. gen., 1 sp., new; *Chaetopapuaia* n. gen., 1 sp., new; *Helinomydaea* n. gen.; 2 spp., both new; *Hebecnema* Schnabl, 4 spp., 3 new; *Myospila* Rondani, 15 spp., 8 new; *Graphomya* Robineau-Desvoidy, 8 spp., 5 new.

The correlation between number and extent of development of ovariole eggs and the degree of sclerotization of the ovipositor is described for several genera. A complex of head characters frequently found together in ♂ Muscidae with a broad front is discussed, and the possible functional significance of some of the characters is suggested.

Introduction

This study was undertaken to provide a taxonomic treatment of some of the Muscidae of possible medical importance in New Guinea and adjacent islands, particularly the Bismarck Archipelago and the Solomon Islands. However, the rich collections of Diptera from the smaller Pacific islands in the B. P. Bishop Museum, Honolulu, made it possible to treat as well the 7 additional species of Mydaeinae from Micronesia, Polynesia and the smaller islands of Melanesia.

I wish to thank Dr J. L. Gressitt of the Bishop Museum for the excellent facilities provided during the course of the work. I also wish to thank Dr D. K. McAlpine, Australian Museum, Sydney, Dr L. Lyneborg, Universitetets Zoologiske Museum, Copenhagen, Dr D. Guiglia, Museo Civico di Storia Naturale "Giacomo Doria", Genoa, and Mr W. Ellis, Zoölogisch Museum der Universiteit van Amsterdam for the loan of specimens, and Messrs D. Lenhoff and J. Lee, who prepared most of the illustrations. Particular thanks are due to Mr A. Pont, British Museum (Natural History), London, who provided much valuable material and who, moreover, made available to me his very detailed manuscript descriptions of many of the types of previously described species. Without his assistance, determination of many of the species would have been impossible.

The following abbreviations are used for collections: AMS — Australian Museum, Sydney; Bishop — B. P. Bishop Museum, Honolulu, Hawaii; BMNH — British Museum (Natural History), London; CNC — Canadian National Collection, Ottawa; CSIRO — Commonwealth Scientific and Industrial Research Organisation, Canberra; MCSNG — Museo Civico di Storia Naturale "Giacomo Doria", Genoa; MNHNP — Muséum National d'Histoire Naturelle, Paris; USNM — United States National Museum, Washington; UZMC

— Universitetets Zoologiske Museum, Copenhagen. All material listed below from the Bismarck Arch. from January to July, 1962, was collected by the Noona Dan Expedition of UZMC.

Subfamilies of Muscidae

The family Muscidae and its subfamilies have been defined and delimited in very different ways by different authors. In this paper the family limits and subfamily definitions of Hennig (1965), based primarily on the structure of the ovipositor, are followed as far as practicable, except that the Fanniidae are treated as a separate family. I agree with Hennig that the structure of the ovipositor is an extremely important (although not infallible) indicator of relationships within the Muscidae, but the ovipositor is absent in ♂♂ and very often completely retracted and hidden in ♀ specimens. It therefore seems desirable to present a key to the subfamilies of Muscidae of New Guinea and Oceania based on characters present in both sexes. This key was prepared after examination of the very large collection of Muscidae from the area in the Bishop Museum. It is admittedly tentative, as many species are probably not yet collected, and further study may indicate that certain aberrant species or groups are incorrectly placed. It may, however, prove useful both to those attempting to identify specimens from New Guinea and to those undertaking further revisionary work on the Muscidae of the region.

Key to Subfamilies of Muscidae of New Guinea and Oceania

1. Proboscis elongate, strongly sclerotized, adapted for piercing, tapering from a broad base to a slender apex and with labella atrophied; pteropleuron haired; vein M_{1+2} gradually curved forward apically from about middle of last section·····**Stomoxydinae**

   Proboscis moderately or weakly sclerotized, not distinctly tapering to apex and with labella well developed and often fleshy; pteropleuron haired or bare; vein M_{1+2} variable, often straight or sharply curved forward near middle of last section·····2

2(1). Pteropleuron with at least a few fine hairs ·····3

   Pteropleuron bare ·····6

3(2). Pteropleuron with strong hairs along upper margin below base of wing, usually also with distinct hairs on lower half; parafacial bare ·····4

   Pteropleuron with only a row or tuft of a few fine rather short hairs on posterior part of lower half above posterior sternopleural bristle; parafacial usually with fine short hairs throughout its length ·····**Limnophorinae** (pt.)

4(3). Vein M_{1+2} with apical portion curved strongly forward at about midlength so that apical width of cell R_{4+5} at most $1\text{-}^1/_2 \times$ length of anterior crossvein; body often metallic in color·····**Muscinae** (pt.)

   Vein M_{1+2} straight or curved only slightly forward, apical width of cell R_{4+5} at least $3 \times$ length of anterior crossvein; body not metallic ·····5

5(4). Pteropleuron with hairs confined to upper margin below wing base; prosternum bare; hind spiracle without strong black setae in marginal fringe·····**Mydaeinae** (pt.)

   Pteropleuron with hairs on lower as well as on upper half; prosternum haired; hind

spiracle with few to many strong black setae in marginal fringe.....
.....**Phaoniinae** (pt.) (*Dichaetomyia*)

6(2). Hind tibia with 1 or more distinct posterodorsal bristles, at least 2/3 tibial diameter in length and clearly distinguishable from neighboring hairs, at from 2/5 to 4/5 tibial length 7

Hind tibia without distinct posterodorsals.....10

7(6). Sternopleural bristles 3 in number, arranged in a nearly equilateral or isosceles triangle with lower bristle almost equidistant from anterior and posterior or slightly but distinctly closer to anterior; prosternum bare; vein M_{1+2} not curved forward apically; front of equal width in both sexes, at narrowest point between antennae and anterior ocellus at least 1/5 as wide as head; ♂ with at least 1 reclinate upper orbital bristle 8

Sternopleural bristles variable in number, if 3 are present, then arranged 1:2; prosternum haired or bare; vein M_{1+2} often curved forward apically; front of ♂ strongly narrowed, at most 1/7 as wide as head, without reclinate upper orbital.....9

8(7). Hind tibia with 2 posterodorsal bristles at about 1/3 and 2/3 tibial length; lower stigmatic bristle directed downward; at least 1 presutural and 3 postsutural dorsocentral bristles distinct, much longer and stronger than mesonotal hairs; arista often long-plumose .....**Coenosiinae**

Hind tibia with a single posterodorsal at about 2/3 tibial length; lower stigmatic bristle not directed downward; at most last 2 postsutural dorsocentrals distinct, others scarcely separable from the rather setulose mesonotal hairs; arista bare or nearly so .....**Phaoniinae** (pt.) (*Atherigona*)

9(7). Beret (upper convex margin of hypopleuron) with rather strong yellow hairs; node of Rs and base of R_{4+5} setose below; sternite 1 bare; body mostly or entirely yellow or yellow-brown .....**Mydaeinae** (pt.)

Not with above combination of characters — either beret bare, node of Rs and base of R_{4+5} bare below, sternite 1 haired or body grey to black in color .....**Muscinae** (pt.)

10(6). Anterior sternopleural bristle absent, arrangement of sternopleurals 0:2; prealar bristle present; vein M_{1+2} slightly to strongly curved forward apically; beret with few to many long dark hairs; hind tibia without anterodorsal apical bristle; arista long-plumose .....**Mydaeinae** (pt.) (*Graphomya*)

Anterior sternopleural present, bristles arranged 1:1, 1:2, 1:3 or 2:2; other characters not all as above.....11

11(10). Vein M_{1+2} curved rather strongly forward apically so that width of cell R_{4+5} at apex at most $1\text{-}1/2 \times$ length of anterior crossvein; hypopleuron with rather strong dark hairs.....**Muscinae** (pt.) (*Passeromyia*)

Vein M_{1+2} usually straight or only slightly curved so that apex of cell R_{4+5} at least $3 \times$ length of anterior crossvein, if cell R_{4+5} more strongly narrowed, then hypopleuron bare 12

12(11). Parafacial with fine short pale hairs throughout its length; prealar bristle short but distinct; node of Rs setulose above and below; hind tibia without anterodorsal apical bristle; arista long-plumose.....**Limnophorinae** (pt.)

Parafacial bare; other characters not all as above.....13

13(12). Prealar bristle present *or* hind tibia with both a dorsal apical bristle and an anterodorsal apical bristle 14

Prealar bristle absent, at most represented by a hair no longer or stronger than other scutal hairs; hind tibia with a dorsal apical bristle but without an anterodorsal apical bristle ..... **Limnophorinae** (pt.)

14(13). Node of Rs with 1 or more distinct setae below and also often above; other veins often with setae on under and/or upper surface 15

Node of Rs without setae; other veins without setae except sometimes a single seta on underside of R_1 ..... **Phaoniinae** (pt.) (*Helina* s.l.)

15(14). Prealar bristle much longer than posterior notopleural, situated very far forward, at least 4 × as far from anterior supraalar as from suture ..... **Phaoniinae** (pt.) (*Helina* s.l.)

Prealar bristle sometimes absent, if present shorter than posterior notopleural and situated at most twice as far from anterior supraalar as from suture ..... **Mydaeinae** (pt.)

Definition and Delimitation of Mydaeinae

The Mydaeinae of New Guinea and Oceania may be distinguished from other regional subfamilies of Muscidae by the following combination of characters: abdomen of ♀ with 5 pairs of spiracles; ♀ cerci short, sclerotized and haired only on the outer surface, and protruding little, if at all, beyond hypoproct (Fig. 15, 118-126, etc.); node of R_s with setae on ventral surface and usually also with setae on dorsal surface; prealar bristle usually present and distinct, if absent then hind tibia with a distinct anterodorsal apical bristle which is at least as strong as dorsal apical bristle; hind tibia without a posterodorsal bristle or with at most a weak one which is not longer than tibial diameter.

The characters other than those of the ♀ abdomen listed above will separate the Mydaeinae from the regional Limnophorinae and Coenosiinae, both of which have the ♀ cerci as in the Mydaeinae. The Muscinae and Phaoniinae are distinguished from these 3 groups by having the ♀ cerci sclerotized and haired on at least the apical part of the inner surface; they are usually long and slender and protrude well beyond the hypoproct, but may be rather short and only slightly protruding. Regional species of the latter 2 subfamilies with setae under the node of R_s may be distinguished in both sexes from the Mydaeinae by having a posterodorsal bristle distinctly longer than the tibial diameter at about 2/3 the length of the hind tibia (most Muscinae), by having the pteropleuron with hairs on both its upper and lower halves (*Dichaetomyia*, some Muscinae), by having strong black setae in the fringe along the anteroventral margin of the posterior spiracle (*Dichaetomyia*), or by having the node of R_s bare above and at the same time having the prealar bristle longer than the posterior notopleural bristle (some *Helina* s.l.).

I have compared the ♂ terminalia of most species of Mydaeinae and Muscinae of New Guinea and Oceania with those of 16 species of Phaoniinae (*sensu* Hennig 1965). I could find no characters, either in the shape of sclerites, in their positions, or in their articulations which would indicate that these 3 subfamilies could be defined or distinguished on the basis of the ♂ terminalia alone.

In order to determine which genera were represented in the region, it was neces-

sary to review the genera of the Mydaeinae on a world basis. Of the 15 genera recognized, 8 occur in New Guinea and 2 others, *Balioglutum* Aldrich from northern Queensland, and *Lasiopelta* Malloch from the Oriental region, may occur there. A key to world genera and a brief discussion of the extralimital genera, of genera incorrectly referred to the Mydaeinae, and of genera unknown to me which may belong to the Mydaeinae, are therefore presented.

The brief definition of the Mydaeinae given above at the beginning of this section will, I think, enable all the described species of Mydaeinae known to me to be assigned to the subfamily on the basis of external characters with the exception of some Palaearctic and Nearctic species of *Hebecnema* which have the veins entirely without setae, and the species of the Ethiopian genus *Pseudohelina* described below which have the node of R_s bare above and below but which have a few setae on the lower surface of R_{4+5} shortly beyond the node. In doubtful cases, the ovipositor should be examined.

Genera Doubtfully or Incorrectly Referred to Mydaeinae

Hennig (1965) listed a number of genera of which he was unable to examine specimens (or at any rate the ovipositor), which were said by the original authors to be related to genera here included in the Mydaeinae or which appear from descriptions to be Mydaeinae. These are discussed briefly here. It is possible that some other genera tentatively referred by Hennig to other subfamilies (e.g. to the *Helina*-group of the Phaoniinae or to the Cyrtoneurinae) may eventually prove to be Mydaeinae.

I have examined specimens of both sexes of the type-species of *Metopomyia* Malloch, 1922, *M. atropunctipes* Malloch, 1922, from several localities in Australia. The ovipositor has the cerci very long, slender, subcylindrical and sclerotized on most of the inner surface, the sclerites of segments 6 and 7 reduced to moderately slender struts, and each half of sternite 8 reduced to a small rounded sclerite. The genus undoubtedly belongs to the Phaoniinae. The veins are without setae and the pteropleuron has numerous hairs on the lower posterior portion; no species of Mydaeinae has this combination of characters.

I have examined specimens of both sexes of the type-species of *Cariocamyia* Snyder, 1951, *C. maculosa* Snyder, 1951, from Nova Teutonia, Brazil. The ovipositor in dorsal view is very similar to that of the species of *Dichaetomyia* figured by Hennig (1965, Fig. 34) but with the halves of tergites 6 to 8 less widely separated from one another. Sternites 6 and 7 are well developed, subtriangular and moderately broad; each half of sternite 8 is represented by a very small rounded sclerotization. Segment 6 has a large pair of spiracles lying just below the anterolateral margins of the tergite. Segments 1 to 5 each has a pair of spiracles. The cerci are rather short and broad, oblique in position, and with the outer surface and most of the inner surface sclerotized and haired. The ♂ has a pair of strong cruciate interfrontal bristles; laterad of the frontal bristles are many short proclinate setae, but no proclinate upper frontal bristles are present. The pteropleuron is bare except for 1 specimen which has 1 hair below the subalar ridge on each side. Other characters are as described by Snyder. The

species is superficially similar to many Mydaeinae but may be readily distinguished by the presence of strong setae on the parafacial ridges extending dorsad almost to the level of the insertion of the arista (in 1 species of *Gymnopapuaia* from New Guinea they extend about halfway to the base of the segment 3, in other Mydaeinae barely above the apex of the segment), and by the presence of several weak but distinct black setae in the posteroventral part of the fringe of the posterior spiracle. The genus is undoubtedly incorrectly placed in the Mydaeinae, but whether it is related to *Dichaetomyia*, whether it belongs to the Cyrtoneurinae as suggested by Hennig, or whether it is unrelated to either of these groups, I am at present unable to say.

Bryantina Malloch, 1926, from Java, almost certainly belongs to the Mydaeinae. Malloch suggested that it was related to *Graphomya* and I have seen a very aberrant species of *Graphomya* from Borneo which has certain characters in common with *Bryantina*. *Oramydaea* Snyder, 1949, from Gold Coast, was referred by Snyder and by Peris (1965) to the Mydaeinae; this placement is probably correct. Hennig suggested that *Subphaonia* Ringdahl, 1934, is probably closely related to *Mydaea*; I have examined the holotype ♂ of the type-species, *Subphaonia nitidiventris* Ringdahl, 1934 (in the Zoological Museum, Lund) and think that it is probably a species of *Mydaea* with a very modified head shape. Hennig also suggested that *Graphomuscina* Townsend, 1918, from Angola, and *Souzalopesomyia* Albuquerque, 1951, from Brazil, are probably not Mydaeinae. I have not seen specimens of these genera.

Description of Mydaeinae

This description is based primarily, and in the case of the ♂ terminalia exclusively, on the species of New Guinea and Oceania. Certain characters present in extralimital species have been added in parentheses.

Length 3.7 to 9.2 mm. Body robust. Color very variable but never metallic. Eye bare or haired. ♂ with front very narrow to broad, usually with front narrow and with only lower orbital bristles and with, inner and outer verticals and postocellars not or scarcely distinguishable from postocular hairs, but in a few species in which the front is unusually broad (up to 1/4 head width at narrowest part of front) there may be 1 or 2 pairs of reclinate upper orbital bristles and distinct and sometimes strong verticals and postocellars. ♀ with front 1/3 to 1/4 head width, slightly narrowed above, with 1 strong and 3 to 5 weaker lower orbitals, usually with 2 reclinate upper orbitals (only 1 in *Myospila effeminata* n. sp. from Fiji), with long strong inner and outer verticals and somewhat shorter and weaker postocellars, without proclinate upper orbitals, and (in regional species) without cruciate interfrontals. Hairs on parafacial ridge usually not extending dorsad of level of apex of antenna, extending to level of middle of antennal segment 3 only in *Gymnopapuaia magnicornis* n. sp. (Fig. 23). Arista plumose, with the longest hairs at least as long as width of antennal segment 3 (short haired in *Opsolasia* and in some species of *Mydaea*). Proboscis stout, labellae well developed, mentum pollinose. Palpus slender or slightly broadened toward apex or throughout, never abruptly broadened and spoon-shaped.

Dorsocentral bristles arranged 2 + 3 or 2 + 4, first 1 or 2 postsuturals sometimes short, acrostichal bristles usually 0 + 1, in *Helinomydaea* n. g. only 1 + 1; posthumeral, presutural, anterior and posterior notopleural, supraalar and postalar bristles present; prealar and intraalar bristles present or absent. Presutural acrostichal hairs usually uniform in size and in 6 or more very irregular

rows, in *Hebecnema* only in 4 more or less regular rows with those in the outer rows longer and stronger than those in the inner rows. Scutellum usually without hairs below the level of the lateral bristles, sometimes with few to many hairs below these bristles or even on underside of anterolateral angles of scutellum. Upper depressed portion of propleuron and subalar knob bare. Postalar declivities and suprasquamal ridge usually bare, with a few hairs in *Myospila laevis* (Stein). Anterior declivity of mesopleuron, hypopleuron, prosternum, metasternum and sternite 1 haired or bare. Pteropleuron usually bare, rarely with a few hairs on subalar ridge immediately below wing base (with a few hairs below subalar ridge only in some species of *Pseudohelina* n.g.). Lower stigmatic bristle curved dorsad, not ventrad. Sternopleural bristles 2 or 3 in number, arranged 0:2, 0:3, 1:2 or in a triangle (1:1 or 2:2 in some extralimital species). Posterior spiracle usually without setae in fringe, rarely with 1 or 2 short black or yellow setae in posterior fringe or with a few fine inconspicuous black setae in anteroventral fringe.

Subcostal sclerite bare. Node of Rs with setae on lower surface and usually also on upper surface; other veins sometimes also with setae (veins entirely bare only in some extralimital species of *Hebecnema*). Vein M_{1+2} straight or curved slightly to strongly forward at apex. Lower squama usually narrow, rounded apically, and with anteromedian angle laterad of anterolateral corner of scutellum; in *Graphomya* (and in *Balioglutum* and in some Oriental species of *Myospila*) lower squama broad, truncate apically, and with anteromedian angle under anterolateral corner of scutellum.

Legs simple, bristles usually slender, anteroventral and posteroventral bristles on apical half of mid and hind femora very rarely short and spine-like. Hind coxa without hairs on upper posterior margin (reportedly present in 1 species from the Ethiopian region). Fore femur with a complete row of posterodorsal bristles, a complete row of posterior bristles, and a complete row of anteroventrals; bristles of other femora more variable. Mid tibia with a strong posterior to posteroventral bristle only in *Graphomya*, never with a strong posteroventral to ventral bristle. Hind tibia without calcar, very rarely with a very short posterodorsal bristle; usually with a distinct strong dorsal apical bristle and a distinct anterodorsal apical which is at least half as long as the dorsal, the former very weak or absent only in *Helinomydaea* n.g., the latter absent only in *Graphomya* (and in *Balioglutum*).

♂ Terminalia very small and retracted. Sternite 5 with only weak bristles and hairs, usually with posterolateral lobes tapering to a bluntly rounded apex; in *Graphomya* only, each lobe with a slender subacute apex; in *Helinomydaea* n.g., sternite truncate apically and with very slender curved lobes. Cerci usually broadly fused into a cercal plate with line of fusion still visible, rarely very narrowly joined, broadly joined with line of fusion obsolete, or joined only by membrane. Each cercus usually with shallow to deep rounded incision at apex but sometimes truncate or produced into a broad or slender point. Surstylus simple, without notches or processes, at most slightly excavated posteromedially, irregularly curved, or slightly widened apically, usually slender except at the extreme base, very broad throughout only in *Graphomya*. Pregonite short, almost flat, bluntly rounded or obliquely truncate apically, base broad and apparently fused anteriorly and laterally with sternite 9, on posterolateral part of base with a few punctures which apparently bear minute setae or very rarely slightly longer and distinct setae; in *Graphomya* only pregonite greatly reduced, base bearing only a barely perceptible and rather compressed swelling. Postgonite variable, elongate except in *Graphomya*, straight or slightly curved, usually slender but sometimes swollen over part or all of its length, with several punctures bearing minute setae on anterior and lateral surfaces, with strong curved anterior setae only in *Helinomydaea* n.g. Aedeagus slender, simple, in the form of a slightly depressed tube, membranous and sometimes broadened apically, never with apical spines or scales. Aedeagal spine usually broad, straight, flat or only slightly thickened, in *Gymnopapuaia* n.g. and *Papuaiella* n.g. tapering to a narrow and distinctly thickened

apex which is curved slightly to strongly ventrad.

♀ Abdomen with 5 pairs of spiracles. Cerci short, sclerotized and haired only on outer surface, protruding little if at all beyond hypoproct. Terminalia otherwise very variable. Sternites sometimes well developed and with short strong spine-like bristles, sometimes extremely small and weak or even absent. Spermathecae 3 in number, subspherical, slightly elongate or suboval, smooth to weakly rugose.

Egg very variable in size and form, always with a pair of distinct longitudinal flanges along the dorsal surface, these flanges ending before or at apex of egg or produced into short to very long apical processes, in the latter case apex of egg often produced into a short to long median process

Key to the Genera of Mydaeinae*

1. Three or 4 sternopleural bristles present, arranged in a triangle or quadrilateral; hind tibia with distinct anterodorsal apical bristle at least as long as tibial diameter; lower squama usually narrow, rounded posteriorly, and with its anteromedian corner distinctly laterad of margin of scutellum, only rarely (in a few Oriental species of *Myospila*) broadened and truncate posteriorly……2

   One to 3 sternopleural bristles, never in a triangle, either the anterior lacking or the lower lacking and the posterior preceded by a row of bristle-like hairs of decreasing size; hind tibia without anterodorsal apical bristle; lower squama broad, truncate posteriorly, and with its anteromedian corner extending under anterolateral corner of scutellum……15

2(1). Thorax with a pair of strong presutural acrostichal bristles at least half as long as first pair of dorsocentrals; hind tibia with dorsal apical bristle very weak or absent, much shorter than anterodorsal apical (New Guinea)……5. **Helinomydaea** n.g.

   Thorax without presutural acrostichal bristles but with at least 4 rows of fine acrostichal hairs; hind tibia with dorsal apical bristle strong, at least as long as anterodorsal apical……3

3(2). Vein R, before humeral crossvein, with 1 or more weak to moderately strong, sometimes pale, setae below (Ethiopian region, New Guinea and adjacent areas)……4

   Vein R, before humeral crossvein, bare below……8

4(3). Prealar bristle shorter than posterior notopleural, situated at most very slightly closer to transverse suture than to supraalar bristle; either Rs before its fork, or node of Rs, and sometimes also Sc and M, setose above; pteropleuron usually bare, rarely with a few hairs on subalar ridge……5

   Prealar bristle longer and stronger than posterior notopleural, situated about 5 × as far from supraalar as from suture; veins entirely bare above; pteropleuron either bare or with a few fine hairs on lower posterior portion, never with hairs on subalar ridge (Ethiopian)……D. **Pseudohelina** n.g.

5(4). Beret (upper convex margin of hypopleuron) bare (Ethiopian)……6
Beret with at least a few hairs (New Guinea and adjacent areas)……7

6(5). Veins Sc, Rs and M setose above and below, node of Rs setose only below; vein M_{1+2} curved distinctly forward at apex; crossveins unclouded, the posterior one

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* Regional genera are numbered, the others lettered.

straight or nearly so; eye bare ..... E. **Dimorphia** Malloch

Veins Sc, Rs and M bare above and below; node of Rs setose above and below; vein M_{1+2} not at all curved forward at apex; anterior crossvein with 1 large dark cloud, the posterior with 1 at each end, the latter strongly sinuate; eye with sparse but distinct hairs ..... C. **Afromydaea** Malloch

7(5). Pteropleuron with distinct dark hairs on subalar ridge (New Guinea) ..... 3. **Papuaiella** n.g.

Pteropleuron bare (New Guinea and adjacent islands, northern Australia, Micronesia) ..... 2. **Gymnopapuaia** n.g.

8(3). Beret (upper convex margin of hypopleuron) bare 9

Beret with at least a few hairs 13

9(8). Presutural acrostichal hairs in 4 more or less regular rows, those in outer rows longer and stronger than in inner rows (all regions except Neotropical) ..... 6. **Hebecnema** Schnabl

Presutural acrostichal hairs uniform in length or strength, in 6 or more very irregular rows 10

10(9). Vein M_{1+2} not at all curved forward apically, distal half of last section with a uniform backward curvature (Fig. 92) 11

Vein M_{1+2} curved at least very slightly and sometimes strongly forward at apex, distal half of last section never with a uniform backward curvature (Fig. 93-95) 12

11(10). Eye bare or very nearly so, if with moderately abundant hairs (1 Neotropical species only), then hairs separated from one another by more than their length (Holarctic, Neotropical) ..... A. **Mydaea** Robineau-Desvoidy

Eye with abundant and distinct hairs which are separated from one another by much less than their length (Holarctic) ..... B. **Opsolasia** Coquillett

12(10). Prealar bristle, when present, much shorter than posterior notopleural and situated scarcely farther from supraalar bristle than from transverse suture (all regions) ..... 7. **Myospila** Robineau-Desvoidy (pt.)

Prealar bristle at least as long and strong as posterior notopleural and situated about 5 × as far from supraalar as from suture (Oriental) ..... F. **Lasiopelta** Malloch

13(8). Hypopleuron with hairs in front of spiracle; hairs on beret long and erect; vein R_1 bare above 14

Hypopleuron bare in front of spiracle; hairs on beret short and appressed; vein R_1 often setose above (Oriental region, New Guinea) ... 7. **Myospila** Robineau-Desvoidy (pt.)

14(13). Hairs on beret and hairs in front of posterior spiracle pale; hairs on prosternum fine, pale; front of ♂ not wider than ocellus, bare or nearly so on upper half (Fig. 4) (New Guinea) ..... 1. **Papuaia** Malloch

Hairs on beret and hairs in front of spiracle black; hairs on prosternum short and setose, black; front of ♂ as wide as ocellar triangle, with strong bristles throughout its length (Fig. 69) (New Guinea) ..... 4. **Chaetopapuaia** n. g.

15(1). Sternopleural bristles arranged 0:1, 0:2, or 0:3, the upper not preceded by bristle-like hairs; hypopleuron with few to many coarse hairs on beret and in front of spiracle; wing membrane usually densely and uniformly covered with fine microtrichia; node of Rs and base of R_{4+5} setose above and below (all regions) ..... 8. **Graphomya** Robineau-Desvoidy

Sternopleural bristles arranged 1:1, posterior one preceded by a row of bristle-like hairs of decreasing length; hypopleuron bare; wing membrane extensively bare on basal half, microtrichia on trichose portions coarse and sparse; node of Rs bare above and below, base of R_{4+5} setose only below (northern Australia)..... G. **Balioglutum** Aldrich

GENERA OF MYDAEINAE NOT KNOWN FROM NEW GUINEA AND OCEANIA

A. **Mydaea** Robineau-Desvoidy, 1830, *Myodaires,* p. 479. Type-species, *Mydaea scutellaris* Robineau-Desvoidy, 1830, by subsequent designation (Coquillett 1901, p. 139).

Synonym: *Xenomydaea* Malloch, 1920, *Trans. Am. Ent. Soc.* 46:144. Type-species, *Xenomydaea buccata* Malloch, 1920 (= *Mydaea otiosa* Stein, 1920), by original designation.

I have examined ♀♀ (including the ovipositor) of *Mydaea rufinervis* (Pokorny), 1889, *scutellaris* Robineau-Desvoidy, and *urbana* (Meigen), 1826 from Europe, of *brevipilosa* Malloch, 1920, *discimana* Malloch, 1920, *flavicornis* Coquillett, 1902, *neglecta* Malloch, 1920, *occidentalis* Malloch, 1920, *otiosa* Stein, and *palpalis* Stein, 1916, from Canada, and of *plaumanni* Snyder, 1941 from Brazil. I consider all these species congeneric.

I think it probable that with the exception of *Opsolasia orichalcea* (Zetterstedt), all the Palaearctic species referred to *Mydaea* by Hennig (1955-64) and all the Nearctic species referred to *Mydaea* and to *Xenomydaea* by Snyder (1949a) and by Huckett (1965a, 1965b) belong to *Mydaea*. I have examined topotypical specimens of *M. plaumanni* Snyder; they have the eye hairs slightly more abundant than do the Nearctic species, but otherwise differ very little. The eye hairs are, however, much less abundant than in *Opsolasia*. The front of the ♀ of *plaumanni* is not unusually narrow. I could find no trace of metasternal hairs and suspect that Snyder was incorrect in stating they were present. I have not seen the other 6 Neotropical species referred by Snyder (1949b) to *Mydaea* but see no reason to doubt his generic placement.

Van Emden (1951) referred 3 species from the Ethiopian region to *Mydaea* s. str. I have seen the ♀ of only one of these, *Mydaea geniculata* Stein; the species is here referred to *Afromydaea* Malloch. I have examined also 1 ♂ of *Spilogaster superba* Stein, 1906, from Tanganyika; the apex of vein R_{4+5} is curved very slightly forward and the species should almost certainly be referred to *Myospila*. I have not seen the third species, *Helina versatilis* Curran, 1938; the description given by van Emden suggests that it may be a species of *Afromydaea*. I was unable to find any specimens of *Mydaea* in the moderately large collections of Muscidae from many parts of the Oriental region in the Bishop Museum or in a large collection from Nepal and smaller collections from India and Ceylon in the Canadian National Collection. The genus *Mydaea* seems, therefore, to occur only in the Holarctic and Neotropical regions.

The genus *Mydaea* may be readily separated from *Myospila* by the complete absence of any forward curvature of the apical portion of vein M_{1+2} and by the structure of the ovipositor. The ovipositors of the species of *Mydaea* I have examined show considerable variation in the strength and number of the spines at the apex of sternite 7 and on the halves of

sternite 8, but otherwise resemble very closely the ovipositor of *Mydaea ancilla* Meigen, 1826, as figured by Hennig (1955-64, p. 117, Textfig. 31). Tergite 7 is deeply divided medially by a narrow membranous area which extends almost to the posterior margin of the sclerite (unfortunately this incision is not shown in Hennig's figure), and each half of tergite 8 is undivided. The species of *Myospila* have the apical portion of vein M_{1+2} curved at least slightly, and sometimes strongly, forward. The many species of which I have examined the ovipositor (listed below under the treatment of *Myospila*) agree in having tergite 7 strongly sclerotized with at most a shallow median notch anteriorly, and in having each half of tergite 8 divided into an anterior and a posterior portion. All of them have the ovipositor very similar to that of *M. meditabunda* (Fabricius) as figured by Hennig (1955-64, p. 117, Textfig. 32) or to those of the species of *Myospila* figured in the present paper (Fig. 118-126).

In addition to the characters listed above, the species of *Mydaea* I have examined all have the eyes bare or nearly so or (*plaumanni* only) with hairs distinct but separated by more than their length, the setae of the veins confined to the upper and lower surfaces of the node of R_s and of the extreme base of R_{4+5}, the lower squama narrow with the posterior margin rounded and the prosternum, pteropleuron, beret, metasternum and sternite 1 bare. The aristal hairs are very variable, ranging in length from little more than the basal diameter of the arista to more than the width of the antennal segment 3, and the prealar bristle is very variable in length, strength and position. The spermathecae are 3 in number as in all Mydaeinae I have examined, rather than 2 as stated by Hennig (1965, p. 50).

The species *otiosa* Stein and *rufinervis* (Pokorny), referred by some authors to *Xenomydaea* because of the broadened parafacial and cheek, have the ovipositor of essentially the same structure as that of other species of *Mydaea*. I agree with Hennig (1955-64) that recognition of the genus *Xenomydaea* is unwarranted.

B. **Opsolasia** Coquillett, 1910, *Proc. U. S. Natn. Mus.* **37**:580. Type-species, *Lasiops calvicrura* Coquillett, 1900 (=*Aricia orichalcea* Zetterstedt, 1849), by original designation.

The single species of this genus has been referred by recent authors (e.g. Hennig 1955-64; Snyder 1949a; Huckett 1965a, 1965b) to *Mydaea*. It is superficially very similar to many species of the latter genus, and like them has the apical portion of vein M_{1+2} without a forward curvature, but the moderately long and dense eye hairs in both sexes and the very distinctive ovipositor indicate that it is reasonable to recognize the genus *Opsolasia*. I have examined specimens of both sexes from Canada and a ♀ from Sweden.

The ovipositor is at most very slightly compressed. The 2 halves of sternite 8 are very weak with only weak apical setae and lie side by side in an almost horizontal plane. The hypoproct, instead of being compressed and strongly convex below as in *Mydaea*, is broad and almost flat with only the anterolateral angles curved slightly dorsad. The membrane between sternites 7 and 8 is only minutely spinose and is not at all enlarged or protruding. Tergite 7 is deeply divided medially, as in *Mydaea*, but each half is subquadrate rather than irregular in outline. Each half of tergite 8 is entire, again as

in *Mydaea*, but the median notch of the tergite is very slender so each half is subrectangular rather than subtriangular.

C. **Afromydaea** Malloch, 1930, *Ann. Mag. Nat. Hist.* **10**(**5**):470. Type-species, *Afromydaea punctatipennis* Malloch, 1930 (= *Mydaea geniculata* Stein, 1913), by original designation.

The single species referred here was placed in *Mydaea* s. str. by van Emden (1951) and referred to *Mydaea* by Hennig (1955-64). It differs from all species of *Mydaea* I have seen in having 3 short but strong setae on the underside of vein R before the humeral crossvein, in having the crossveins heavily clouded and the posterior one strongly sigmoid, in having the eyes with distinct and moderately dense hairs and in having each half of tergite 8 of the ♀ almost completely divided into an anterior and a posterior portion which are only narrowly joined laterally. The ovipositor is otherwise essentially as in *Mydaea* and the relationship between the 2 genera is probably very close.

The arista is plumose, with the longest hairs about as long as the width of the antennal segment 3. The prosternum, pteropleuron and hypopleuron are bare. The prealar bristle is very short and slightly closer to the supraalar bristle than to the transverse suture. The setae of the node of R_s are very strong and extend onto the basal 1/5 of vein R_{4+5}, and the apical portion of vein M_{1+2} is entirely without a forward curvature. I have examined 1 ♀ of *geniculata* from Ethiopia.

It is interesting that all Palaearctic, Oriental and Nearctic Mydaeinae have unclouded crossveins, but the single species of *Afromydaea* and the 1 undoubted species of *Myospila* I have seen from the Ethiopian region have strongly clouded crossveins, as do many of the Ethiopian species of *Helina* s. l. recorded by van Emden.

D. **Pseudohelina** Vockeroth, new genus. Type-species, *Helina phaeoxantha* van Emden, 1951.

Dark brown or black subshining species with unmarked wings. Front of ♂ not wider than anterior ocellus, bare on upper half except for a pair of weak bristles near lower ocellus, frontal vitta obliterated above. Front of ♀ without cruciate bristles. Eye with a few minute hairs. Arista with longest hairs slightly longer than width of antennal segment 3. Dorsocentral bristles arranged 2 + 3 or 2 + 4; acrostichals 0 + 1. Presutural acrostichal hairs uniform in length, in about 8 to 10 irregular rows. Prealar bristle longer and stronger than posterior notopleural and as long as first postsutural dorsocentral, situated about 5 × as far from supraalar bristle as from transverse suture. Two strong intraalar bristles. Scutellum without hairs below level of lateral bristles. Sternopleural bristles 1:2. Prosternum bare. Pteropleuron with a few fine hairs on lower posterior portion (below subalar ridge) or entirely bare. Hypopleuron usually with a few fine hairs on upper convex margin (beret), without hairs in front of spiracle or above hind coxa, rarely entirely bare; metasternum bare. Vein R with 2 or 3 fine setae on lower surface before humeral crossvein; vein R_{4+5} with 3 to 5 fine setae below on basal third, the setae beginning some distance beyond the node of Rs; other veins, including node, bare above and below. Apical half of last section of vein M_{1+2} very slightly sigmoid, extreme apex straight or curved very slightly forward. Posterior crossvein slightly sigmoid. Sternite 1 bare. Ovipositor very similar to that of *Myospila* (Fig. 118-126) but a little more elongate so tergite 6 exposed when the ovipositor is extended. Posterior part of each half of tergite 8 broadened laterally and narrowly joined laterally to anterior part.

Each half of sternite 8 weakly setose and only as long as lateral length of posterior part of half of tergite 8. Hypoproct almost flat, only weakly and uniformly convex below, pentagonal in ventral view. Spermathecae 3 in number, suboval to subcylindrical.

The species included here were placed by van Emden (1951) in *Helina* (*Helinella*). I have examined specimens, from many localities, of *Spilogaster propinqua* Stein, 1901, the type of *Helinella* Malloch. It is undoubtedly a species of *Myospila*, with the ovipositor as in other species of that genus, with the prealar bristle short and equidistant from the supraalar and the suture, with vein R bare below and the node of R_s setose below, and with the apex of vein M_{1+2} curved slightly but distinctly forward. To *Pseudohelina* I refer *Helina phaeoxantha* van Emden, 1951, and *Helina castanea* Curran, 1938. I have examined both sexes of the former and ♀♀ only of the latter; the ovipositor of both species was examined. All the specimens were from Tanganyika. It seems probable that all the species referred to *Helina* (*Helinella*) by van Emden (1951) with the exception of *lenticeps* (Thomson) (as *propinqua* (Stein)) will be found to be referable to *Pseudohelina*. Van Emden stated that all of them had a long strong prealar, and indicated that they formed a compact group which should perhaps be treated as a distinct subgenus of *Helina*. Pont (1969b) has figured and described the ovipositor of *Helina subsetosa* Curran, 1938, a species probably referable to *Pseudohelina*. It apparently differs from those of *phaeoxantha* and *castanea* in having tergite 6 absent, sternite 6 and the halves of sternite 8 greatly reduced, and tergite 8 much better developed. This suggests that the species of *Pseudohelina* may have the ovipositor more variable than indicated above.

Hennig (1955-64) listed 12 Palaearctic species of *Helina* with setae on the lower surface of the node of R_s. I have examined European ♀♀ of 4 of these species: *atripes* (Meade), 1889, *consimilis* (Fallén), 1825, *ciliaticosta* (Zetterstedt), 1845, and *fratercula* (Zetterstedt), 1845. In all 4 species the ovipositor is of the typical *Phaonia*-type as defined by Hennig (1965), with the sclerities of segments 6 and 7 reduced to slender struts and the cerci long and slender and subcylindrical on the apical half. These 4 species are undoubtedly not Mydaeinae; the same is probably true of the 8 other species treated by Hennig. According to Hennig, all Palaearctic species of *Helina* have the apices of veins R_{4+5} and M_{1+2} diverging; this character should allow separation of those species of *Helina* with the node setose below from *Myospila propinqua*. The 4 species of *Helina* listed above all have the prealar about half as long as the posterior notopleural and can thus be easily distinguished from *Pseudohelina*. Some species of this group of *Helina* have a long prealar and may be rather difficult to distinguish from *Pseudohelina*, but none of these *Helina* species are described as having setae on the underside of vein R. The 2 groups of species may moreover be completely separated geographically, as *Pseudohelina* is apparently confined to the Ethiopian region.

I have seen also specimens of *Helina* s.l. from New Guinea with the node of R_s setose below and the prealar bristle long and strong. These species can be distinguished from *Pseudohelina* by the lack of setae on the underside of vein R.

E. **Dimorphia** Malloch, 1922, *Ann. Mag. Nat. Hist.* (**9**)**9**:273. Type-species, *Cyrtoneura flavicornis* Macquart, 1843, by original designation.

Synonym (?): *Didierimyia* Séguy, 1937, *Genera Insect.* **205**:280. Types-pecies, *D. aureonigra* Séguy, 1937, by original designation.

I have examined specimens of both sexes of *Dimorphia setulosa* (Stein), 1918, from South Africa and of *D. tristis* (Wiedemann), 1830, from Tanganyika. Both species have the ovipositor moderately well sclerotized and very similar to that of *Mydaea* (cf. Hennig, 1955-64, Fig. 31), differing noticeably only in having tergite 7 rather more elongate and narrowly but completely divided medially, in having each half of tergite 8 almost completely divided into an anterior and a posterior portion which are only narrowly joined laterally (as in *Afromydaea*), and in having each half of sternite 8 slender throughout.

The figure and description of the ovipositor of *D. flavicornis* (Macquart), the type-species, given by Hennig (1965, p. 53) suggest that the latter species has an ovipositor very different from that of the 2 species I examined. Hennig described tergites 6 to 8 as being almost completely reduced; either 2 very different types of ovipositor occur in what would seem to be a single genus on the basis of the distribution of the setae on the wing veins, or else the specimen studied by Hennig was very teneral or over-macerated.

The 2 species I have examined, and apparently all species of the genus (van Emden, 1951), have setae on the lower surface of vein R before the crossvein, on both surfaces of the basal part of Sc, on both surfaces of R_s, on the lower surface of the node of R_s and of R_{4+5} almost to the crossvein, on both surfaces of M and of M_{1+2} to beyond the posterior crossvein, and on the lower surface of Cu. No other Mydaeinae known to me have the veins so extensively setose. Also, the arista is long-plumose, the eye is virtually bare, the prealar bristle is short or indistinguishable, the pteropleuron is bare, and vein M_{1+2} is moderately or rather strongly curved forward apically. In the 2 species I have examined the hypopleuron is bare except for a few fine hairs above the hind coxa, the hind coxae are bare posteriorly, and the sternite 1 is bare. Van Emden treated *Didierimyia* as a synonym of *Dimorphia*. Séguy's description of the wing venation and of the setae on the veins suggests that it may be. However, it was also said to have hairs on the upper posterior surface of the hind coxa (not otherwise known in Mydaeinae) and to have a haired prosternum, so that its inclusion in the genus *Dimorphia* should be verified. The genus *Dimorphia* is restricted to the Ethiopian region.

F. **Lasiopelta** Malloch, 1928, *Ann. Mag. Nat. Hist.* (**10**)**2**:309. Type-species, *L. orientalis* Malloch, 1928, by original designation.

Synonym: *Pendleburyia* Malloch, 1928, *Ann. Mag. Nat. Hist.* (**10**)**2**:312. Type-species, *Mydaea longicornis* Stein, 1915, by original designation.

I have not seen specimens of the type-species of *Lasiopelta* but have examined specimens from Viet Nam of both sexes of *L. similis* Malloch, 1928, a species described as being extremely similar to *orientalis*, and of both sexes of a second species extremely similar to *similis*. Both these species are almost certainly congeneric with *orientalis*. Both of them have the ovipositor very similar to that of *Pendleburyia longicornis* (Stein),

1915, as figured by Hennig (1965, Fig. 38), with tergite 6 bearing a pair of short, and tergite 7, a pair of very long anterior processes, and with the proctiger, and particularly the cerci, greatly reduced in size. I have examined 1 ♂ of *longicornis* from Taiwan. Despite the many differences between this ♂ and the ♂♂ of the 2 species of *Lasiopelta,* the great similarity in the ovipositors of the 2 groups, almost certainly due to synapomorphy, supports the treatment of *Pendleburyia* as a synonym of *Lasiopelta.*

In all 3 species the prealar bristle is strong, at least as long as the posterior notopleural, and situated about 5 × as far from the supraalar as from the transverse suture. This character readily separates *Lasiopelta* from *Myospila,* as indicated above in the generic key. All 3 species have the eye virtually bare, the node of R_s and base of R_{4+5} to or beyond the crossvein strongly setose both above and below, the apex of vein M_{1+2} curved very slightly forward, the pteropleuron and metasternum bare, and the sternite 1 haired (only very sparsely in *longicornis*). *L. similis* and the other species from Viet Nam have the prosternum haired, the scutellum with abundant hairs below the lateral bristles or even onto the ventral surface, the ♂ front extremely narrow (according to Malloch it is rather broad in *orientalis*) and vein R_1 of the ♀ (but not of the ♂) setose below. In *similis* the hypopleuron is bare, in the undescribed species it has a few fine pale hairs in front of the spiracle. *L. longicornis* has the prosternum bare, the scutellum with very few hairs below the lateral bristles, the ♂ front about 1/4 the head width (according to Malloch as wide as that of the ♀), the hypopleuron bare, and, like the other species, vein R_1 bare below in the ♂.

Pont (1966a, b) referred to *Lasiopelta* several New Guinea species which are placed in this paper in *Myospila.* The genus *Lasiopelta* as defined above is known only from the Oriental region, but it may yet be found in New Guinea.

G. **Balioglutum** Aldrich, 1925, *Proc. U.S. Natn. Mus.* **661**(18):9. Type-species, *B. illingworthi* Aldrich, 1925, by monotypy.

This genus is known only from northern Queensland. I have examined 2 ♂ paratypes of the only known species. The habitus is suggestive of *Graphomya,* and I have little doubt the 2 genera are related, but this can probably only be definitely demonstrated by a comparison of the ovipositors. Some of the similarities of and differences between the 2 genera are given above in couplets 1 and 15 of the key to genera.

Distribution of Mydaeinae of New Guinea and Oceania

The Mydaeinae of the area are highly endemic at both the generic and specific levels. Unfortunately, little material was available from Indonesia apart from West Irian, so it is possible that some of the genera and species apparently restricted to the area considered here occur also in the islands to the west of New Guinea. However, a moderate amount of material was available from North Borneo, the Philippines and southeast Asia, and none of the 4 genera listed below as apparently restricted to New Guinea, nor *Gymnopapuaia,* which extends only slightly outside New Guinea, were seen from these areas.

A brief summary of the distribution of the species treated in this paper, and of the extralimital distribution of the widespread genera occurring in New Guinea, is given here. A list of the species is given at the end of the taxonomic section.

1. *Papuaia* Malloch — New Guinea only, 5 spp.
2. *Gymnopapuaia* n.g. — New Guinea only, 19 spp.; Bismarck Arch. only, 2 spp.; New Guinea and Bismarck Arch., 1 sp.; Solomon Is., 1 sp.; Palau Is., 1 sp.; Tanimbar Is., 1 sp.; northern Queensland, 1 sp.
3. *Papuaiella* n.g. — New Guinea only, 1 sp.
4. *Chaetopapuaia* n.g. — New Guinea only, 1 sp.
5. *Hebecnema* Schnabl — New Guinea, 2 spp.; Solomon Is., 1 sp.; New Caledonia, 1 sp. Also a few species in Australia and in the Oriental, Palaearctic, Ethiopian and Nearctic regions.
6. *Helinomydaea* n.g. — New Guinea only, 2 spp.
7. *Myospila* Robineau-Desvoidy — New Guinea, 9 spp.; Bismarck Arch., 7 spp.; Solomon Is., 5 spp.; Amboina, 3 spp. (a number of these species occur in several of these areas as well as in Borneo, Philippines and southeast Asia); New Hebrides, 1 sp.; Fiji, 1 sp. Also in northern Australia (1 sp.) and in the Oriental (many spp.), Ethiopian (several spp.), Palaearctic (3 spp.), Nearctic (1 sp.) and Neotropical (several spp.) regions.
8. *Graphomya* Robineau-Desvoidy — New Guinea, 5 spp.; Bismarck Arch., 3 spp.; Solomon Is., 2 spp.; Micronesia, 2 spp.; Hawaii, 1 sp. (probably introduced by man). Two of the 8 regional species are widespread. The other 6 are known only from New Guinea, Bismarck Arch. and Solomon Is.; 2 of these 6 occur in more than 1 of these areas. Also a small number of species in Australia and in the Oriental, Ethiopian, Palaearctic, Nearctic and Neotropical regions.

Possible Medical Importance of Mydaeinae of New Guinea and Oceania

Several of the species treated here have been taken on human excrement. These are *Papuaia curvinervis* (Stein), *Gymnopapuaia conformis* n. sp., *G. albicornis* n. sp., *G. clavipalpis* n. sp., *G. feminina* n. sp., *G. paula* n. sp., *Hebecnema infuscata* (Bigot), *H. gressitti* n. sp., *H. rufula* n. sp., *Myospila laevis* (Stein) and *M. aureorufa* n. sp. Whether any of these species are of medical importance will almost certainly depend on whether they have any other association with man. This is at present unknown.

Mydaeinae of New Guinea and Oceania

For widely distributed genera only the more important references to the literature are given.

Unless otherwise indicated in the individual descriptions, the following general description applies to all genera and species described below:

Eye bare or with only extremely short, scattered, scarcely discernible hairs. Upper and anterior eye facets of ♂ at most moderately enlarged. ♂ with inner and outer verticals and postocellars very short and weak, not distinguishable from postocular hairs. ♀ with 2 reclinate upper orbitals. Antennal segment 3 moderately slender, not extending ventrad to level of strongest vibrissa. Vibrissal angle not noticeably pro-

duced forward. Palpus slender, only very slightly broadened toward apex. Thorax with 0 + 1 acrostichal bristles, with 2 strong humerals, a strong anterior and a weaker posterior supraalar, a strong posterior intraalar, and 3 postalars, inner one distinct but much shorter and weaker than middle one. Scutellum with 1 pair of strong and 2 pairs of weaker marginals and 1 pair of strong apicals, without hairs below level of marginals. Lower portion of propleuron with 1 strong and 1 or 2 weak bristles. Stigmatic area with 1 strong bristle and below it 1 weak bristle. Mesopleuron posteriorly with 4 or 5 strong and 1 or 2 weaker bristles, dorsally near anterior margin with 1 weak but distinct bristle. Anterior declivity of mesopleuron bare above stigmatic bristles and hairs. Pteropleuron bare. Sternopleural bristles arranged 1:2. Metasternum bare. Spiracular fringe without distinct setae. Lower squama narrow, rounded posteriorly. Leg bristles slender. Mid femur with strong anterior bristle at about mid-length. Hind femur with a complete row of anterodorsals. Fore tibia without posterior bristle, without anterodorsal in ♂, with short anterodorsal in ♀. Mid tibia with 2 strong posterior bristles, hind tibia with a short strong anterodorsal and 1 or 2 weaker anteroventrals, without a posterodorsal, with a strong dorsal apical and an equally strong or only slightly weaker anterodorsal apical. Sternite 5 of ♂ with tapering, broadly rounded posterior lobes. Surstylus at least twice as long as its greatest postbasal width. Pregonite with a distinct ventral process which is at least as long as broad. Aedeagus slender, neither abruptly broadened nor constricted. Aedeagal spine broad and straight.

Genus **Papuaia** Malloch

Papuaia Malloch, 1921, *Ann. Mag. Nat. Hist.* (**9**)**8**:422. Type-species to be designated by I.C.Z.N. Pont (*in litt.*) says that the nominal species cited by Malloch as the type, *Mydaea rufescens* Stein, belongs to the genus *Dichaetomyia*, whereas the specimens so determined by Malloch, and upon which he based his description of the genus *Papuaia*, are of the species *Spilogaster curvinervis* Stein, 1900. The I.C.Z.N. will be asked to designate the latter species as the type of *Papuaia*.

Alghetimyia Séguy, 1937, *Genera Insect.* **205**:347. Type-species, *A. rufa* Séguy, 1937 (= *Spilogaster curvinervis* Stein, 1900), by original designation.

Large, robust, shining, yellow to reddish species, usually with dark thoracic and abdominal markings and always with very narrow front in ♂. Length 6.6 to 9.7 mm.

Front of ♂ at narrowest point at most as wide as anterior ocellus; orbitals on anterior half of front distinct, lowest one about as long as antennal segment 3, others decreasing gradually in length and strength, upper half of front with a few minute hairs or entirely bare (Fig. 3, 4). Thorax with 2 strong humeral bristles, 2 + 3 or 2 + 4 strong dorsocentrals; anterior intraalar present or absent; prealar absent in ♂, strong and about 2/3 as long as posterior notopleural in ♀; presutural acrostichal hairs in about 10 very irregular rows. Hypopleuron with many long pale hairs on beret, a few shorter pale hairs in front of spiracle, and usually a tuft of short pale hairs above hind coxa. Prosternum with many fine pale hairs; metasternum and sternite 1 each with a few short pale hairs. Posterior spiracle very large, in ♂ $1\text{-}^1/_3$ × as long as dorsal margin of beret, in ♀ as long as this margin. Wing with apex of vein M_{1+2} curved distinctly forward (Fig. 1, 2); posterior crossvein strongly sinuate; vein R bare below; node of Rs with 4 or 5 short setae above and below. Squama, squamal fringe and haltere dark yellow, unicolorous. Mid femur preapically with 6 bristles above, anterodorsal to posterior in position, increasing in length and strength

posteriorly, and with 3 ventral bristles near base usually continued to apex as a row of weak posteroventrals. Hind femur with 1 posterodorsal and 1 posterior preapical, with a complete or incomplete row of anteroventrals which are stronger near apex, and with 1 or 2 posteroventrals on basal half. Fore tibia rarely with a weak anterodorsal bristle in ♂.

♂ *Terminalia* (Fig. 5-11). Cercal plate longer than broad, cerci broadly fused but line of fusion distinct; each cercus with rather deep rounded apical notch; hairs of cerci abundant, as long and strong as hairs of tergite 9. Postgonite slightly to strongly swollen throughout. Aedeagal spine broad throughout, straight.

♀ *Terminalia.* Ovipositor (Fig. 12, 13, 15, 16) depressed, weakly sclerotized, very short, in dorsal view only tergite 8 and proctiger extending beyond tergite 5, ventrally ovipositor (from base of sternite 6) just over 1/4 as long as preabdomen. Intersegmental membranes dorsally shorter than sclerites. Setae all fine and rather short. Tergites 6 and 7 short, transverse, divided. Tergite 8 about twice as long as tergite 7, transverse, anterior margin triangularly emarginate. Sternites 6, 7 and 8 sometimes absent, when present as follows: sternite 6 small, subquadrate, with a group of setae on each side near posterior margin; sternite 7 divided, each half a small subcircular plate with a few short setae and 2 or 3 longer ones; sternite 8 divided, each half minute, with 2 or 3 very short setae. Membrane between segments 7 and 8 not enlarged, without discernible vestiture. Epiproct small, rounded and sometimes narrowed posteriorly, uniformly sclerotized. Hypoproct very large, pentagonal, almost flat, uniformly sclerotized, entire surface with setae which increase in length posteriorly. Cercus of moderate size.

Egg (Fig. 14, 17). Very large, stout, about 2/3 length of preabdomen, with 2 wavy-margined flanges running almost entire length of egg, ending without free processes near anterior end. Micropyle large, very near anterior end of egg. Anterodorsal surface, cephalad of flanges, apparently papillate, with subcircular pores; other surface markings obscure but visible on entire surface in reflected light.

DISTRIBUTION. New Guinea.

DISCUSSION. The treatment of the species of *Papuaia* presented here is tentative. *P. asternata* n. sp. is undoubtedly distinct. The 4 other nominal species treated below may all be conspecific; they differ from one another only in color or, in the case of *quadrisetosa* n. sp., in the number of dorsocentral bristles. On the other hand, the specimens referred to *curvinervis* (Stein) are very variable in color and may represent a complex of species. The ♂ terminalia of the specimens referred to these 4 species show many very slight differences in the shape of the apical processes of the cercal plate, but these do not seem to be correlated with differences in color.

I know of no other genus of Mydaeinae with the sternites of the ovipositor so reduced nor with the eggs so large and so reduced in number. The abdomens of 5 ♀♀ with an egg present were macerated; in each case, only 1 egg was found. In 1 specimen of *asternata* the egg contained a third instar larva and a second instar exuvium; 1 egg of *curvinervis* contained the same, and 2 other eggs only a third instar larva; 1 egg of *marginata* contained a second instar larva. It seems almost certain that the marked or even complete reduction of the sternites of the ovipositor is to allow the passage of a very large egg containing a mature or nearly mature larva or of a second or third instar larva which has already left the egg. The reduction or absence of sternite 8 suggests that the egg or larva are dropped onto the surface of the substrate rather than being inserted into it.

Key to Species of Papuaia

1. Anterior intraalar bristle absent; vein M_{1+2} curved strongly forward apically (Fig. 1); ♂, cercal plate slightly narrowed toward apex (Fig. 9); ♀, halves of sternite 8 present although minute (Fig. 13)·····2

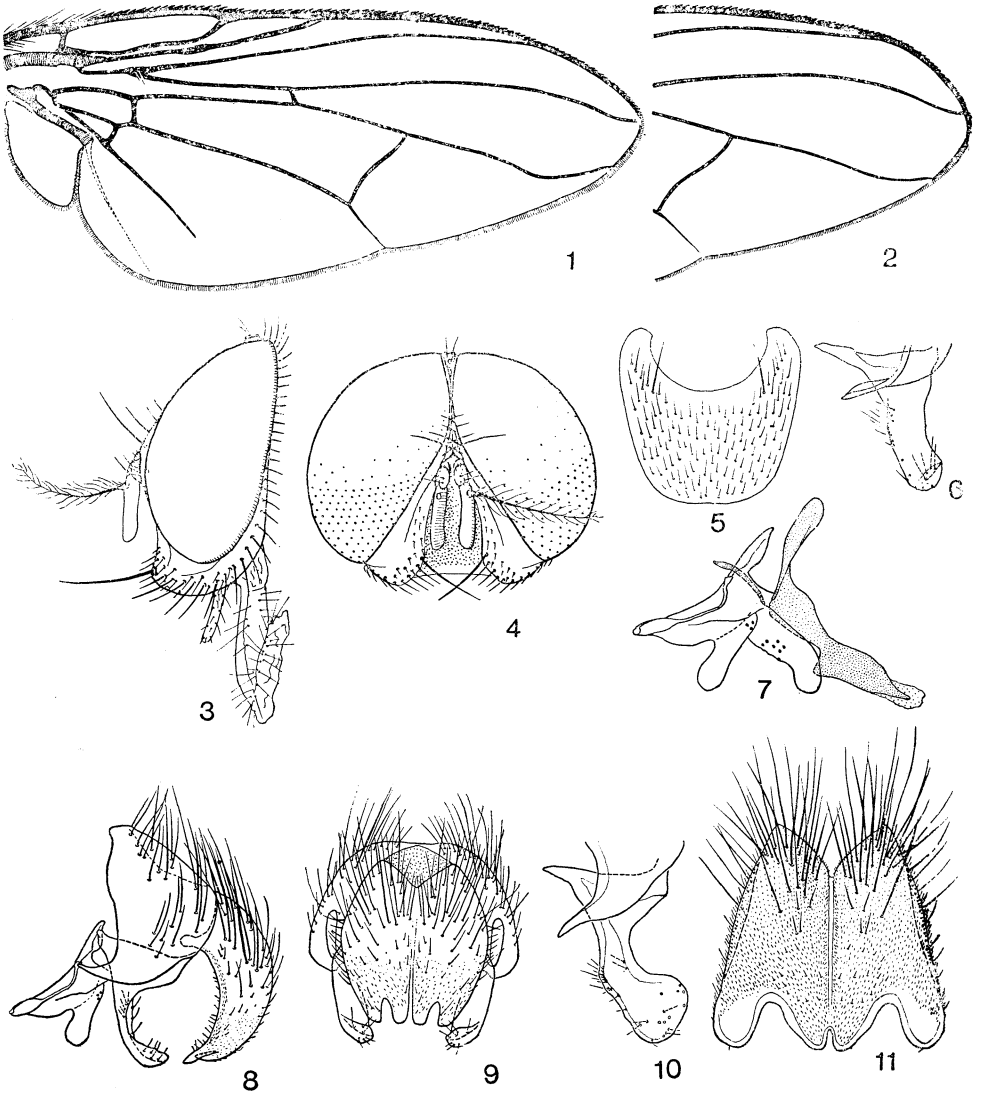

Fig. 1-11. 1, *Papuaia curvinervis* (Stein), wing; 2, *P. asternata* n. sp., wing apex. 3-9, *P. curvinervis* ♂: 3, head, lateral; 4, head, anterior; 5, sternite 5, ventral; 6, left surstylus, anterolateral; 7, sternite 9 and genitalia, lateral (aedeagus stippled); 8, terminalia, lateral; 9, tergite 9, cerci and surstyli, posterior. *P. asternata* ♂: 10, left surstylus, anterolateral; 11, cerci, posterior.

Anterior intraalar present, about half as long as posterior intraalar; M_{1+2} curved only weakly forward apically (Fig. 2); ♂, cercal plate distinctly broadened towards apex (Fig. 11); ♀, halves of sternite 8 absent (Fig. 16)·····**asternata** n. sp.

2. Three postsutural dorsocentrals present ·····3

Four postsutural dorsocentrals; mesonotum with dark median stripe; abdomen extensively darkened·····**quadrisetosa** n. sp.

3. Mesonotum uniformly reddish-yellow, without dark median stripe·····4

Mesonotum with narrow to broad dark median stripe·····**curvinervis** (Stein)

4. Abdomen entirely reddish-yellow, tergites without dark margins·····**immaculata** n. sp.

Tergites 3 and 4 with narrow dark posterior margins·····**marginata** (Stein)

Papuaia curvinervis (Stein) Fig. 1, 3-9, 12-14.

Spilogaster curvinervis Stein, 1900, *Termêszetr. Füz.* **23**:136; 1900, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **40**:378.

Mydaea curvinervis, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16**:183; 1919, *Nova Guinea* **13**:204.

Papuaia curvinervis, Pont, 1969, *Dt. ent. Z.* N.F. **16**:83.

Papuaia rufescens, Malloch, 1921, *Ann. Mag. Nat. Hist.* (9)**8**:422 (misidentification, not *Spilogaster rufescens* Stein, 1900).

Alghetimyia rufa Séguy, 1937, *Genera Insect.* **205**:347.

Very variable in color pattern but always with dark median mesonotal stripe and with at least narrow dark posterior bands on tergites 2 to 4.

♂. Length 6.6 to 8.7 mm. Head shape as in Fig. 3, 4. Width of front slightly variable, sometimes as wide as anterior ocellus and with frontal vitta linear, usually much narrower than ocellus and with frontal vitta obsolete on about 1/3 of frontal length. Front, parafacial and upper part of cheek dark reddish, parafrontal and parafacial silvery pollinose; face white to pale grey, whitish pollinose especially on facial ridges; lower part of cheek dark grey; postcranium pale grey, yellowish below, strongly pollinose. Antenna entirely dull yellow or with apex or all of segment 3 pale to dark brown. Palpus of uniform width throughout, usually dull yellow to brown, rarely entirely black.

Thorax reddish-yellow, with dark brown to blackish, poorly defined, median mesonotal stripe which usually fills the space between the 2 rows of dorsocentrals but may be narrower, broader or shorter posteriorly or may extend clearly or obscurely onto disc of scutellum. Dorsocentral bristles arranged 2 + 3; anterior intraalar absent; hypopleuron with a few fine hairs above hind coxa. Apex of vein M_{1+2} curved rather strongly forward (Fig. 1). Legs with coxae and femora reddish yellow, fore tibia yellow to brown, mid and hind tibiae, and all tarsi, brown to black. Hind femur with an entire row of anteroventrals which are strong only near apex, and with 1 posteroventral. Fore tibia sometimes with a weak anterodorsal.

Abdomen reddish yellow, tergite 2 with a very narrow to broad, brown to blackish posterior band which is narrow medially, tergites 3 and 4 each with dark posterior band which may be very narrow and linearly produced medially or variably broadened; in the extreme condition reaching broadly to base of tergite on most of dorsal surface and extending posteriorly almost to margin of tergite. Terminalia (Fig. 5-9): Cercal plate narrowed below; surstylus almost straight or only slightly curved and not broadened apically; postgonite slightly swollen, almost parallel-sided, apex curved slightly forward.

♀. Length 7.1 to 9.2 mm. Very similar to ♂ except for usual sexual differences, equally variable in color. Terminalia (Fig. 12, 13): Sternites 6, 7 and 8 present. Epiproct broadly rounded posteriorly, less than half as long as basal width.

Egg (Fig. 14). Flanges narrow posteriorly, broader anteriorly, subtruncate at anterior end, broadly separated, not closely appressed, with surface markings of wavy diagonal lines and weaker transverse lines; posterior end of egg rugose dorsally; rest of egg surface with obscure irregular hexagonal pattern.

Type localities and types. Spilogaster curvinervis Stein: Paumonufluss, New Guinea. Lectotype designated by Pont (1969a); in MCSNG. I have examined this specimen.

Alghetimyia rufa Séguy: Humboldt and Dorey sinus, New Guinea. Holotype ♂ in MNHNP. Mr Pont has examined the type and sent me a specimen considered by him to be conspecific with it.

DISTRIBUTION. New Guinea, 60-1100 m.

OTHER SPECIMENS EXAMINED (BISHOP, BMNH, CNC, AMS). NW NEW GUINEA: 1 ♂, 1 ♀, Kebar Val., W of Manokwari, Vogelkop, 550 m, 4-31. I. 1962, L. W. Quate; 3 ♂♂, Waris, S of Hollandia, 450-500 m, 16-23. VIII. 1959, T. C. Maa; 1 ♂, 3 ♀♀, Archbold Lake, Central Mts, 760 m, 26. XI.-3. XII. 1961, S. Quate; 1 ♀, Ifar, Cyclops Mts, 300 m, 20. VI. 1959, ex fresh human excrement, J. L. Gressitt; 1 ♀, Genjam, 40 km W of Hollandia, 100-200 m, 1-10. III. 1960, Maa. NE NEW GUINEA: 1 ♂, 1 ♀, Bainyik, 150 m, S of Maprik, 12. I. 1960, Maa; 2 ♂♂, Busu R., E of Lae, 100 m, 13. IX. 1955, Gressitt; 1 ♂, Pindiu, Huon Penin., 860 m, 22. IV. 1963, J. Sedlacek; 1 ♀, Finschhafen, Huon Penin., 80 m, 13. IV. 1963, Sedlacek; 1 ♂, 2 ♀♀, Mt Missim, Morobe District, Wau, 1100 m, 17. I. 1963, H. W. Clissold; 1 ♂, Wau, 1050 m, J. & M. Sedlacek; 1 ♂, Karimui, 1080 m, 14. VII. 1963, M. Sedlacek; 1 ♀, Karimui, S of Goroka, 1000 m, 7. VI. 1961, J. & M. Sedlacek; 1 ♀, Kalalo, 750 m, 20-30. VIII. 1966, ex Malaise trap, G. A. Samuelson; 3 ♀♀, Deutsch Neuguinea; 1 ♀, Stephansort, Astrolabe Bay, 1894, Kunzmann. SE NEW GUINEA: 1 ♂, 1 ♀, Kokoda, 366 m, 1933, on river bank, L. E. Cheesman. 1 ♂, Embola R., Ajeka, Popondetta, 3. XI. 1963, D. K. McAlpine; 3 ♂♂, Mt Lamington District, Northern Division, VI, VII. 1927, X. 1929, C. T. McNamara; 1 ♂, Buri, nr Sasambata, Popondetta, 31. X. 1963, McAlpine; 1 ♀, Igora Estate, Popondetta, 2. XI. 1963, McAlpine; 1 ♀, Popondetta, 60 m, 26. IX. 1963, ex Malaise trap; 1 ♀, Loloipa, Goilala, Owen Stanley Range, 1-15. II. 1958, W. W. Brandt.

Papuaia immaculata Vockeroth, new species

♂. Very similar to *curvinervis* (Stein), differing as follows: Length 8.2 to 8.7 mm. Antennal segment 3 pale brown to dark brown on at least apical half and sometimes over its entire length. Palpus dark yellow. Thorax and abdomen unmarked, former without dark median dorsal stripe, latter without dark posterior margins on tergites. Fore tibia yellow, mid and hind tibiae dark yellow to brownish, tarsi dark brown to black. Fore tibia with short but distinct anterodorsal bristle. Terminalia as in *curvinervis*.

♀. Unknown.

DISTRIBUTION. New Guinea, 800-1850 m.

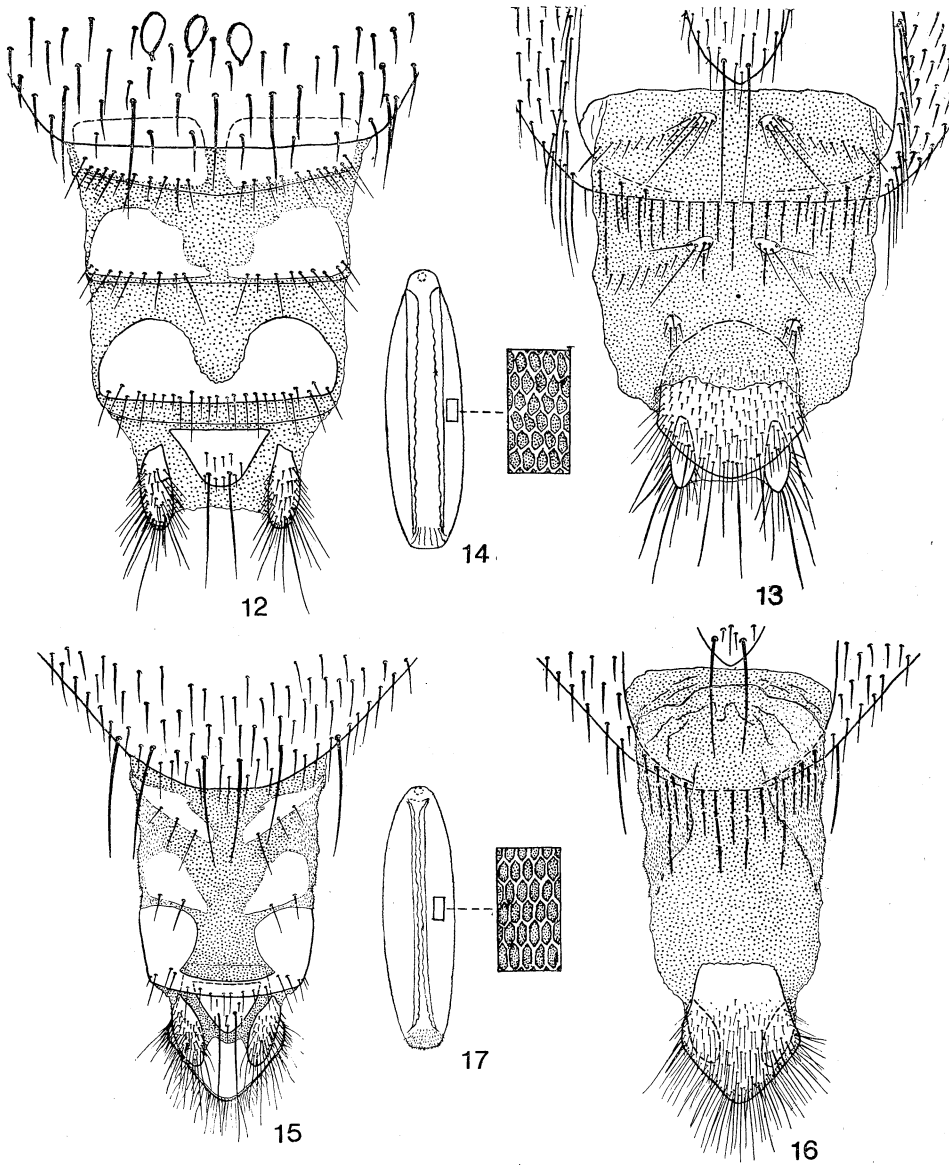

Fig. 12-17. 12-14, *Papuaia curvinervis* (Stein), ♀: 12, terminalia, dorsal; 13, terminalia, ventral; 14, egg, dorsal, with enlargement of surface markings. 15-17, *P. asternata* n. sp., ♀: 15, terminalia, dorsal; 16, terminalia, ventral; 17, egg, dorsal, with enlargement of surface markings.

Types. Holotype ♂ (BISHOP 9586), Wisselmeren, Enarotali, NW New Guinea, 1850 m, 12. VII.-4. VIII. 1962, ex Malaise trap, J. Sedlacek. Paratypes (BISHOP): 1 ♂, same data as holotype; 1 ♂, Banz, Wahgi Valley, NE New Guinea, 1500 m, 21. VII. 1955, ex light trap, J. L. Gressitt; 1 ♂, Wanuma, Adelbert Mts, NE New Guinea, 800-1000 m, 26. X. 1958, Gressitt; 1 ♂, Mt Hagen area, NE New Guinea, 1650 m, 28. VI. 1957, D. E. Hardy.

Papuaia marginata (Stein)

Spilogaster marginata Stein, 1900, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **40**:374.

Mydaea marginata, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16**:183.

Papuaia marginata, Pont, 1966, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **76**:98.

Very similar in both sexes to *curvinervis* (Stein), differing as follows:

♂. Length 8.2 mm. Antennal segment 3 obscurely darkened on apical third. Palpus dark yellow. Thorax unmarked, dorsum entirely reddish-yellow. Fore tibia dark yellow, mid and hind tibiae and all tarsi brown to dark brown. Hind femur with 2 or 3 weak but distinct posteroventrals on basal half. Tergite 2 with barely discernible dark posterior band, tergites 3 and 4 each with dark band covering about posterior 1/4 of segment. Terminalia as in *curvinervis.*

♀. Length 7.2 mm. Very similar to ♂. Antennal segment 3 obscurely darkened on about apical 2/3. Terminalia and egg as in *curvinervis.*

Type locality and type: Bujakori, New Guinea. Lectotype ♂, designated by Pont (1966b), in MCSNG. Mr Pont sent me a very detailed description of the lectotype.

DISTRIBUTION. New Guinea.

SPECIMENS EXAMINED (BISHOP). SE NEW GUINEA: 1 ♂, Lalokai, XI. 1910, F. Muir; 1 ♀, Brown R. nr Port Moresby, 10 m, 5. X. 1958, J. L. Gressitt.

Papuaia quadrisetosa Vockeroth, new species

Very similar to *curvinervis* (Stein), differing as follows:

♂. Length 8.2 mm. Antenna entirely pale to bright yellow. Palpus dark brown to black. Mesonotum with broad blackish median stripe which extends laterad of dorsocentral bristles and onto base, or to apex, of scutellum. Dorsocentral bristles strong, arranged 2 + 4. Fore tibia brown except basally, with short but distinct anterodorsal bristle; mid and hind tibiae dark brown to black. Tergite 2 with posterior dark band moderately broad, tergites 3 and 4 dark brown to black except anterolaterally. Terminalia as in *curvinervis.*

♀. Very similar to ♂. Antennal segment 3 slightly brownish apically. Palpus yellowish on about apical 1/4. Terminalia as in *curvinervis.*

DISTRIBUTION. New Guinea, 550-1200 m.

Types. Holotype ♂ (BISHOP 9587), Kebar Val., W of Manokwari, Vogelkop, NW New Guinea, 550 m, 4-31. I. 1962, S. Quate. Paratypes (BISHOP): 1♂, Guega, W of Swart Val., NW New Guinea, 1200 m, 15. XI. 1958, J. L. Gressitt; 1 ♀, Archbold Lake, Central Mts, NW New Guinea, 760 m, 26. XI.-3. XII. 1961, S. & L. Quate.

Papuaia asternata Vockeroth, new species Fig. 2, 10, 11, 15-17.

Very similar in appearance to *curvinervis* (Stein) and almost as variable in color.

♂. Length 7.1 to 7.7 mm. Head color and structure as in *curvinervis*. Antenna pale yellow, segment 3 at most very slightly brownish apically. Palpus yellow to yellow-brown, slender basally, very slightly broadened towards apex.

Thorax reddish-yellow, with poorly defined pale brown to dark brown median stripe which is usually narrower than distance between dorsocentrals, only rarely extends beyond them, and never extends onto scutellum. Dorsocentrals strong, arranged 2 + 3; anterior intraalar present, moderately strong; hypopleuron without hairs above hind coxa. Wing (Fig. 2) with vein M_{1+2} curved less strongly forward at apex than in *curvinervis*. Legs mostly yellow, mid and hind tibiae dark yellow to dark brown, tarsi dark brown to black. Leg bristles as in *curvinervis*.

Abdomen reddish-yellow, tergite 2 with very narrow brown posterior margin, tergite 3 with slightly broader brown margin which is obscurely broadened medially and sublaterally, tergite 4 with brown to dark brown posterior margin which is broadened medially to reach anterior margin of the tergite narrowly or very broadly, tergite 5 obscurely brownish on disc. Terminalia (Fig. 10, 11): Cercal plate strongly broadened below; surstylus moderately curved, distinctly broadened towards apex; postgonite strongly thickened and broadened beyond base.

♀. Length 6.6 to 8.2 mm. Very similar to ♂ except for usual sexual differences. Terminalia (Fig- 15, 16): Sternites 6, 7 and 8 absent. Epiproct narrowly rounded posteriorly, about 2/3 as long as basal width.

Egg (Fig. 17). Flanges narrow throughout, close together, closely appressed to egg surface, with rather distinct and regular hexagonal pattern which continues over entire egg surface except anterior porous area and distinctly papillate posterior end of egg.

DISTRIBUTION. New Guinea, 700-1850 m.

Types. Holotype ♂ (BISHOP 9588), Mt Hagen area, NE New Guinea, 1650 m, 28. VI. 1957, D. E. Hardy. Paratypes (BISHOP, BMNH, CNC, CSIRO): NW NEW GUINEA: 2 ♀♀, Bomberi, Vogelkop, 700-900 m, 5. VI. 1959, J. L. Gressitt; 1 ♀, Kamo Valley, Urapura, Wisselmeren, 1530 m, 15. VIII. 1959, Gressitt; 1 ♂, Karubaka, Swart Val., 1500 m, 11. XI. 1958, Gressitt; 1 ♀, same data but 1450 m, 12. XI. 1958, ex light trap. NE NEW GUINEA: 4 ♂♂, 6 ♀♀, same data as holotype; 2 ♀♀, Mt Hagen, 1600 m, 23. V. 961, ex light trap, Gressitt; 3 ♂♂, 1 ♀, Morobe District, Wau, 1200 m, 25. VII. 1961, 21-25. I. 1963, 18-20. VIII. 1964, ex Malaise trap, J. Sedlacek; 1 ♀, Kunai Creek, Morobe District, Wau, 1250 m, 26. VIII. 1963, ex Malaise trap, Sedlacek; 1 ♀, Wau, 1000 m, 1-5. IV. 1964, ex Malaise trap, Sedlacek; 1 ♀, Watabung, nr Goroka, E Highlands, 1730 m, 17. X. 1957, E.G. Munroe & G.P. Holland; 1 ♀, E Highlands, Goroka, 25-29. V. 1965, R.W. Crosskey; 1♂, 2 ♀♀, Goroka, 1850 m, 14. V. 1966, ex light trap, J.L. & M. Gressitt; 1 ♂, W High-lands, Kamang, nr Minj, 1850 m, 21. V. 1966, ex Malaise trap, Gressitt; 1 ♂, Sinofi, 30 km S of Kainantu, 1590 m, 1-6. X. 1959, T.C. Maa; 1 ♂, 1 ♀, Banz, Wahgi Valley, 1500 m, 20. VII. 1955, ex light trap, Gressitt; 1 ♀, Banz, W of Nondugl, 1750 m, 21. VII. 1955, ex light trap, Gressitt; 1 ♀, Kassam, 48 km E of Kainantu, 1350 m, 7. XI. 1959, Maa; 1 ♀, Minj area, 1700 m, 30. VI. 1957, Hardy; 1 ♂, W Highlands, Minj, 8-13. IX. 1959, Maa; 1 ♀, Upper Jimmi Val., Tsenga, 1200 m, 13. VII. 1955, ex light trap, Gressitt. SE NEW GUINEA: 1 ♂, S Highlands, N of Mendi, 1300 m, 8. X. 1958, Gressitt.

Genus **Gymnopapuaia** Vockeroth, new genus

Type-species, *Aricia albicornis* Walker, 1864.

Small to large, robust, shining, yellow to dark brown or rarely blackish species, often with dark median or paired mesonotal stripes and with dark abdominal bands, with front of ♂ very narrow to broad. Length 4.1 to 9.7 mm.

Front of ♂ usually at narrowest point only slightly wider than anterior ocellus, with frontal vitta obsolete on median third, with 1 strong and several weaker lower orbital bristles of decreasing length on lower half of front and with at most a few minute hairs on upper half of front (Fig. 21); rarely front at narrowest point from 1/7 to 1/3 head width, with 1 to 4 lower orbitals of nearly uniform or of decreasing length and with 2 distinct reclinate upper orbitals (Fig. 22, 23). Vibrissal angle usually not at all prominent, sometimes produced distinctly forward. Parafacial hairs, above vibrissal prominence, usually very short, appressed and scarcely discernible; these hairs long, erect and prominent only in *magnicornis* n. sp. Antennal segment 3 usually slender, in anterior view 2-1/2 to 3 × as long as segment 2, rarely elongate and sometimes also greatly broadened, from 4 to 7 × as long as segment 2. Palpus slender throughout, slightly spatulate or moderately broadened and thickened. Thorax with 2 strong humeral bristles and 2 + 3 or 2 + 4 strong dorsocentrals; prealar short, present or absent in ♂, usually present in ♀; intraalars usually 2, anterior one moderately strong but weaker than posterior, rarely anterior one absent or a weak third intraalar present between other 2; postalars usually 2, rarely a weak but distinct third present at extreme inner end of postcallus. Presutural acrostichal hairs usually in about 8 to 10 very irregular rows separated on each side from dorsocentral bristles by a bare strip, rarely in as few as 3 to 4 irregular rows or with scattered hairs between dense rows and dorsocentrals. Mesopleuron usually with distinct anterodorsal bristle. Anterior declivity of mesopleuron usually bare, rarely with abundant hairs on upper part. Sternopleural bristles 3 in number, usually with lower one much closer to posterior than to anterior, rarely with lower one almost equidistant from other 2. Hypopleuron with few to many, pale or dark, rather short to long hairs on beret and in front of spiracle, usually with a few short hairs on metepisternum. Prosternum and metasternum bare; sternite 1 usually bare, rarely with a few fine hairs. Posterior spiracle variable in size, usually larger in ♂ than in ♀, usually with only fine hairs in marginal fringe, rarely with 1 or 2 distinct black or yellow setae in posterior fringe. Wing with apex of vein M_{1+2} curved very slightly to rather strongly forward (Fig. 18-20). Posterior crossvein usually strongly sinuate, rarely nearly straight. Ventral surface of vein R, just before humeral crossvein, with 1 to 5 very short weak setae. Base of R_{4+5} ventrally with several fine often rather long setae which may extend along vein almost to anterior crossvein, dorsally with a few short setae at extreme base or rarely without setae. Leg bristles similar to those of *Papuaia*; anteroventral and posteroventral bristles of mid and hind femur variable in length and number; fore tibia usually with a short anterodorsal in ♂, always with anterodorsal in ♀, usually without posterior but rarely with a strong posterior at midlength; hind tibia usually without posterodorsal, rarely with a very short one at 1/3 its length. Tergite 2 laterally with weak discals and marginals; tergite 3 laterally usually with weak marginals, with a very strong marginal only in *lativittata* n. sp.; tergite 4 with an entire but sometimes sparse row of marginals, with discals at most laterally; tergite 5 with an entire row of marginals, with 1 to 5 discals on each side.

♂ *Terminalia* (Fig. 24-26, 31-65). Cerci usually broadly fused, narrowly fused only in *multisetosa* n. sp.; line of fusion usually distinct, rarely obsolete. Cercus usually entirely covered with minute pile, sometimes ventral margin or much of ventral half without pile. Hairs on upper 1/2 to 1/3 of cercus usually moderately long and abundant, subequal in length and strength to those of tergite 9, very long only in *albicornis* (Walker); hairs on rest of cercus usually very short, sparse

and scattered, rarely longer, more abundant and concentrated in particular areas. Cercus usually with shallow to rather deep apical notch, rarely entire and produced into a long or short point. Sternite 9 distinctly deeper than in *Papuaia*. Postgonite moderately swollen throughout or more strongly swollen basally. Aedeagal spine tapering to a narrow and somewhat thickened apex which is curved rather strongly ventrad.

♀ *Terminalia* (Fig. 27-29). Ovipositor moderately long, part of tergite 6 and almost all of tergite 7 exposed dorsally, in ventral view about half as long as preabdomen. Tergite 6 very broad and short, narrowly divided medially, the 2 halves often overlapping. Tergite 7 a long posteriorly-broadened plate, narrowly emarginate anteriorly and broadly emarginate posteriorly, very narrowly divided medially into 2 elongate triangular portions. Tergite 8 similar in shape to tergite 7 but much smaller, broadly divided, with a row of weak setae in membranous posterior emargination. Sternite 6 extremely small, slightly broadened posteriorly, about as long as broad, either with a pair of very strong apicolateral bristles and a few minute hairs, or with 6 moderately strong and several shorter bristles. Sternite 7 usually a weakly sclerotized plate about twice as long as broad and with 1 or several pairs of moderately long apicolateral bristles, sometimes reduced to a minute slender anteromedian sclerotized fragment and a minute sclerotized area around base of each bristle, or reduced to only these minute sclerotized areas. Sternite 8 of 2 widely separated halves, each a slender triangular sclerite ending in a very short, stout, strongly tapering seta and with many similar but much smaller setae on surface. Epiproct well developed but not large, subtriangular with rounded apex; cerci small, not extending beyond hypoproct; hypoproct large, with lateral and posterior margins curved upward.

Egg (Fig. 30). Long, slender, 1/2 to 5/7 length of preabdomen, on entire length with a pair of strong inrolled dorsolateral flanges which become deeper anteriorly and project anteriorly as tapering filaments, broad basally and slender apically, 1/5 to 1/3 as long as body of egg. Anterior end of egg produced forward as a strongly tapering, slender, median filament subequal in length to anterolateral filaments. Upper margin of broadened portion of flange and of anterolateral filaments sometimes very irregular, with semicircular protuberances. Area between flanges thickened medially, thickened area sometimes with raised margins anteriorly and sometimes transversely rugose. Outer surface of flange and base of lateral process obliquely striate, slender portion of anterior processes without distinct markings, rest of egg surface with distinct oblique hexagonal pattern. Eggs up to 8 in number in 1 specimen, without trace of developing larva.

Distribution. New Guinea, Bismarck Arch., Solomon Is., Larat (Tanimbar Is.), Palau Is. (Micronesia), Queensland.

Discussion. The species of this genus are superficially very similar to those of *Papuaia* and share with them a hypopleuron with abundant hairs on the beret and in front of the spiracle, but the very different ♀ terminalia and egg indicate that generic status for the group is warranted. Fortunately, the bare prosternum (haired in *Papuaia*) allows easy separation of the genus in both sexes. Moreover, *Gymnopapuaia* has 1 or several very short weak hairs on the under surface of vein R just before the humeral crossvein, and has the metasternum bare; *Papuaia* has R bare below and the metasternum with fine hairs. The only constant difference in the ♂ terminalia appears to be the greater depth of sternite 9 in *Gymnopapuaia*.

The species seem to form 3 distinct and probably natural groups which may be distinguished by means of constant or nearly constant differences in both external characters and the ♀ terminalia. The second and third groups are restricted to New Guinea and the Bismarck Arch.; the first group occurs throughout the range of the genus

with the exception of the Bismarck Arch., where it has not yet been recorded. The groups may be diagnosed as follows (asterisks indicate the species of which the ♀ terminalia have been examined):

Albicornis group — 4 postsutural dorsocentrals; posterior spiracle with distinct seta in posterior fringe; sternite 1 bare or with fine hairs; fore tibia without posterior bristle; front of ♂ very narrow; ♀ terminalia with sternite 7 usually reduced to a minute area around base of bristles (moderately well developed, but short, only in *palau);* sternite 6 and sternite 7 apically each with 1 pair of moderately strong bristles and a few short or minute hairs (Fig. 27-29). Included species: **albicornis* (Walker), **conformis* n. sp., *hypopleuralis* (Malloch), **palau* (Snyder), *rufiscuta* n. sp., *solomonensis* n. sp.

Clavipalpis group — 4 postsutural dorsocentrals; posterior spiracle without seta; sternite 1 bare; fore tibia without posterior bristle; front of ♂ very narrow; ♀ terminalia with sternite 7 well developed and elongate, sternites 6 and 7 apically each with several pairs of weak subequal bristles and several slightly shorter hairs. Included species: *acuta* n. sp., *annulata* (Stein), *aquila* n. sp., **clavipalpis* n. sp., *decipiens* (Stein), *lativittata* n. sp., *multisetosa* n. sp., **quadristriata* (Stein), *unisetosa* (Stein). *G. bicincta* (Stein) undoubtedly belongs in this group.

Clivata group — 3 postsutural dorsocentrals; posterior spiracle without seta; sternite 1 bare; fore tibia with or without posterior bristle; front of ♂ very narrow to very broad; ♀ terminalia with sternite 7 well developed and elongate, sternites 6 and 7 apically each with 1 pair of moderately strong bristles and a few short or minute hairs. Included species: *brunneisquama* n. sp., **clivata* n. sp., **diffidentia* n. sp., *feminina* n. sp., **laterohirta* n. sp., **magnicornis* n. sp., *marginisquama* (Stein), **paula* n. sp., **precaria* n. sp., **sexvittata* n. sp.

The presence of up to 8 ovariole eggs in 1 female without sign of developing larvae, contrasted with a single egg containing a well-developed second or third instar larva in several species of *Papuaia*, suggests that the species of *Gymnopapuaia* are oviparous and that the egg probably produces a first instar larva.

A considerable number of specimens of this genus, mostly ♀♀, from New Guinea and the Bismarck Arch. remain unidentified. A number of species show considerable variation in both color and bristling, and it therefore seems unwise to describe species from ♀♀ alone unless a series of specimens with reasonably constant characters is available. Several of the unidentified ♀♀ are from high altitudes in New Guinea, have a posterior bristle on the fore tibia, and apparently represent distinct species related to *clivata* n. sp. Others, from both New Guinea and the Bismarcks, apparently represent species related to *clavipalpis* n. sp. None of the unplaced specimens has a seta in the fringe of the posterior spiracle. A few of these specimens are briefly discussed following the descriptions of species to which they may belong, but most of them are not mentioned.

Key to Species of Gymnopapuaia

1. Thorax with 4 postsutural dorsocentral bristles 2

Thorax with 3 postsutural dorsocentrals 17

2(1). Posterior margin of metathoracic spiracle with a distinct black or yellow seta in marginal fringe 3

Spiracle without marginal seta 8

3(2). Palpus distinctly bicolored, basal half black or nearly so and apical half yellow; sternite 1 of abdomen with 1 pair or more of fine hairs 4

Palpus unicolorous or very nearly so; sternite 1 bare 6

4(3). Thorax and femora entirely dark brown to black (Palau I., Micronesia) ..... **palau** (Snyder)

Thorax entirely yellow or with at most a narrow dark stripe on mesonotum 5

5(4). Tergites 3 and 4 each with black posterior band extending almost to tergal base; tergite 5 almost entirely black; mesonotum yellow in both sexes (Larat) ..... **rufiscuta** n. sp.

Tergites 3 and 4 with black posterior band on apical 1/3 or less; tergite 5 black on about posterior half; mesonotum with narrow median dark stripe in ♂, entirely yellow in ♀ (Solomon Is.) ..... **solomonensis** n. sp.

6(3). Mesonotum entirely yellow; vein M_{1+2} with apex curved strongly forward (Fig. 19) (Queensland) ..... **hypopleuralis** (Malloch)

Mesonotum with dark median stripe as wide as space between dorsocentrals; vein M_{1+2} with apex curved only very slightly forward (Fig. 18) (New Guinea) 7

7(6). Scutellum with well-defined black basal triangle ..... **albicornis** (Walker)

Scutellum entirely yellow ..... **conformis** n. sp.

8(2). Palpus dark brown to black, in ♀ rather strongly clavate and thickened 9

Palpus yellow to yellow-brown throughout or at least on apical half, slender or slightly flattened and spatulate 13

9(8). Mesonotum unicolorous, reddish-yellow, without dark median stripe (New Guinea) ..... **decipiens** (Stein)

Mesonotum with broad blackish median stripe 10

10(9). (♂ only; ♀ unknown). Hind femur on basal half with 5 or 6 posteroventral bristles as long as femoral diameter; vein M_{1+2} more strongly curved forward at apex (as in Fig. 18); fore tibia with short but distinct anterodorsal bristle; cercus produced into a single apical point (Fig. 38) (Bismarck Arch.) ..... **acuta** n. sp.

Hind femur on basal half with 2 or 3 posteroventrals; M_{1+2} less strongly curved at apex (Fig. 20); ♂, fore tibia with or without anterodorsal, cercus with apex notched 11

11(10). Dark mesonotal stripe extending laterad to intraalar bristles; ♂, cerci as in Fig. 41 (Bismarck Arch.) ..... **aquila** n. sp.

Dark mesonotal stripe extending laterad only to dorsocentrals or rarely to a point halfway between dorsocentrals and intraalars 12

12(11). (♂ only; ♀ unknown). Fore tibia with short but distinct anterodorsal bristle; cerci as in Fig. 39 (New Guinea) ..... **annulata** (Stein)

Fore tibia without anterodorsal; cerci as in Fig. 36 (New Guinea) ..... **clavipalpis** n. sp.

13(8). Mesonotum with 2 pairs of narrow dark submedian stripes, the 2 stripes of one side separated by row of dorsocentrals; scutellum with a narrow median dark stripe and dark anterolateral angles; presutural dorsocentrals not separated from acrostichal

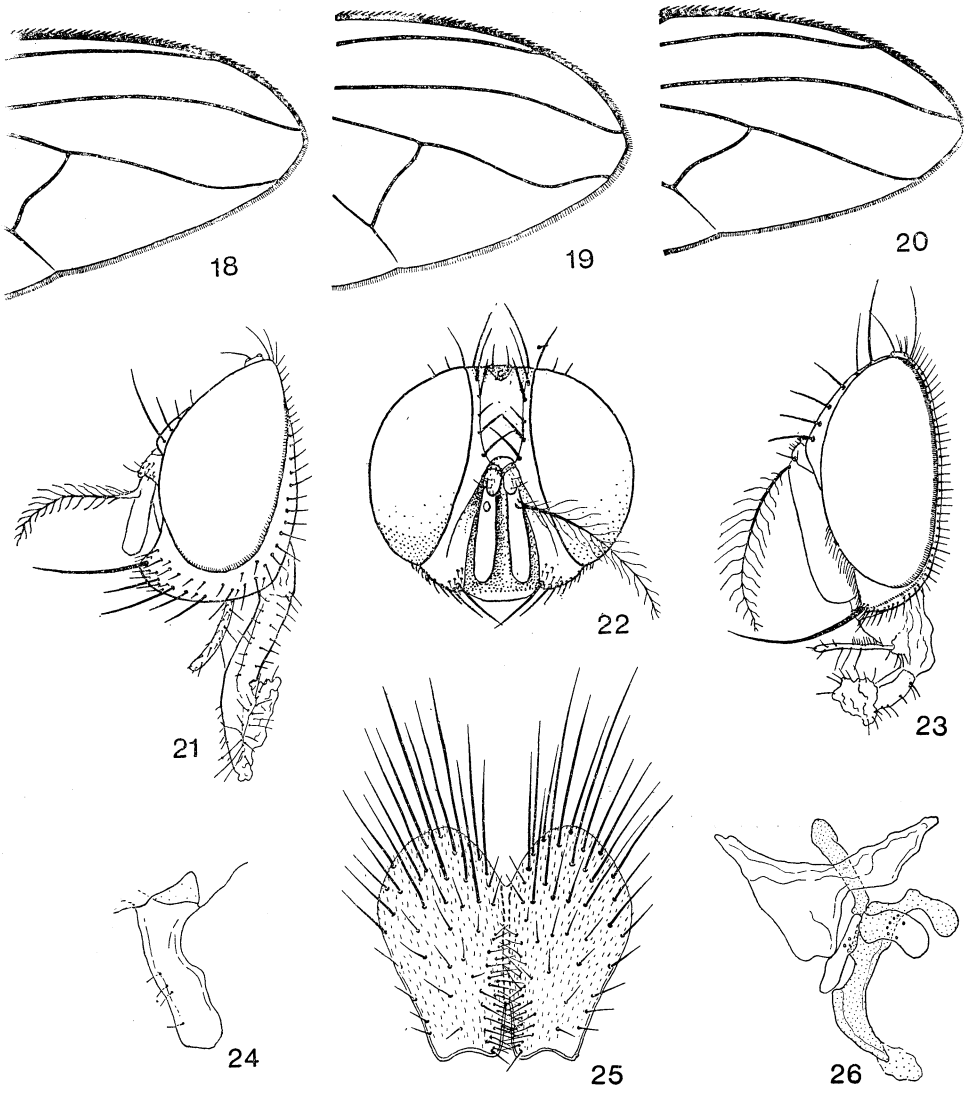

Fig. 18-26. 18, *Gymnopapuaia albicornis* (Walker), wing apex; 19, *G. hypopleuralis* (Malloch), wing apex; 20, *G. clavipalpis* n. sp., wing apex; 21, *G. clivata* n. sp., ♂ head, lateral, holotype; 22, *G. paula* n. sp., ♂ head, anterior, holotype; 23, *G. magnicornis* n. sp., ♂ head, lateral, holotype. 24-26, *G. albicornis*, ♂: 24, left surstylus, anterolateral; 25, cerci, posterior; 26, sternite 9 and genitalia, lateral (aedeagus stippled).

hairs by a broad bare area; antennal segment 3 yellow-orange at extreme base, otherwise brownish (New Guinea)·····**quadristriata** (Stein)

(♂ only; ♀ unknown). Mesonotum with a single, broad, distinct or obscure, median dark stripe; scutellum entirely yellow or with a large basal black triangle; pre-

sutural dorsocentrals separated from acrostichal hairs by a broad bare stripe; antennal segment 3 entirely pale yellow 14

14(13). Scutellum with large black basal triangle, only a narrow margin yellow; dark mesonotal stripe very broad, postsuturally extending laterad beyond intraalars and sometimes as far as anterior supraalar; prealar bristle absent; tergite 4 with 4 very strong marginal bristles (New Guinea, Japen I.) ..... **lativittata** n. sp.

Scutellum entirely yellow; mesonotal stripe narrower, extending at most slightly laterad of dorsocentrals; tergite 4 with 8 or more weaker marginals 15

15(14). Prealar bristle present, about half as long as posterior notopleural; hind femur with about 6 posteroventral bristles on basal 2/3 16

Prealar bristle absent; hind femur with 1 short but distinct posteroventral bristle at 1/3 its length, without other anteroventral or posteroventral bristles on basal 2/3 ..... **unisetosa** n. sp.

16(15). Palpus straight, slender, of uniform width throughout, entirely dull yellow (New Guinea) ..... **multisetosa** n. sp.

Palpus curved and slightly clavate, yellow with basal 1/3 brown (New Guinea) ..... **bicincta** (Stein)

17(1). Fore tibia with strong posterior bristle near midlength 18

Fore tibia without posterior bristle 21

18(17). Large species, at least 7 mm in length; scutellum with pale median stripe or basal triangle, lateral margins distinctly darker; ♂ (known only in *clivata*) with front extremely narrow 19

Small species, less than 5 mm in length; scutellum entirely yellow; ♂ with front almost 1/3 head width (New Guinea) ..... **feminina** n. sp.

19(18). Scutellum with median pale stripe parallel-sided or nearly so; anterior part of postsutural area between dorsocentrals with a pair of submedian dark stripes which fuse posteriorly with main dark stripe along the line of dorsocentrals (New Guinea) ..... **sexvittata** n. sp.

Scutellum with pale basal triangle which is strongly narrowed apically; mesonotum postsuturally without partly detached dark stripes between main dark stripes, presuturally sometimes with a broad obscure dark median stripe 20

20(19). Presutural acrostichal hairs sparse, in 5 or 6 irregular rows; scutellum without hairs below level of marginal bristles (New Guinea) ..... **clivata** n. sp.

Presutural acrostichal hairs dense, in 8 or 9 irregular rows; scutellum on each side with an irregular row of 6 to 8 dark hairs below level of marginal bristles (New Guinea) ..... **laterohirta** n. sp.

21(17). Mesonotum unicolorous or nearly so, bright yellow to brownish, without distinct black median stripe 22

Mesonotum with distinct black median stripe or submedian stripes 23

22(21). Small species, not over 5 mm in length; ♂, front at narrowest point 1/4 head width, with 2 distinct reclinate upper orbitals (Fig. 22) (New Guinea, Bismarck Arch.) ..... **paula** n. sp.

Larger species, at least 6 mm in length; ♂, front at narrowest point scarcely wider than anterior ocellus, without upper orbitals (New Guinea) ..... **precaria** n. sp.

23(21). Squamae entirely yellow; scutellum sometimes brown apically or with brown basal

triangle; ♂, front almost 1/7 head width, with 6 pairs of strong bristles; antennal segment 3 greatly enlarged, about 7 × as long as 2 (Fig. 23); ♀, antennal segment 3 about 4-1/2 × as long as 2 (New Guinea) ····· **magnicornis** n. sp.

Squamae brownish with darker margins or with at least inner margin of lower squama dark brown; scutellum without distinct markings; antennal segment 3 not more than 3 × as long as 2; ♂, front very narrow, with 1 pair ofstrong and several pairs of much weaker bristles ····· 24

24(23). Mesonotum yellow with moderately well-defined dark brown to black median stripe which extends at most slightly laterad of dorsocentral bristles; hind femur with a distinct posteroventral bristle near midlength ····· 25

Mesonotum dark medially, becoming gradually paler laterally but without any sharp contrast in color; hind femur without posteroventral bristle (New Guinea) ····· **marginisquama** (Stein)

25(24). (♂ only; ♀ unknown). Mid and hind tibiae dark brown, much darker than basal half of corresponding femora; squamae yellow brown, entire margin of upper and inner margin of lower squama narrowly brownish; abdomen pale yellow, tergites 3 and 4 each with sharply defined posterior black band, tergite 5 black (New Guinea) ····· **brunneisquama** n. sp.

Mid and hind tibiae yellow, scarcely darker than their femora; squamae pale yellow, inner margin of lower squama broadly dark brown, rest of squamal margins pale yellow; abdomen yellow, tergites 3 to 5 mostly obscurely brownish, without distinct dark markings (New Guinea) ····· **diffidentia** n. sp.

Gymnopapuaia albicornis (Walker), n. comb. Fig. 18, 24-30.

Aricia albicornis Walker, 1864, *J. Proc. Linn. Soc.* **7:** 216; 1866, *J. Proc. Linn. Soc.* **9:** 22.
Spilogaster albicornis, Stein, 1901, *Z. Syst. Hymenopt. Dipterol.* **1:** 186.
Mydaea albicornis, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 185; 1919, *Nova Guinea* **13:** 202.
Papuaia albicornis, Pont, 1966, *Ann. Mag. Nat. Hist.* (**13**)**9:** 88.

♂. Length 5.1 to 7.6 mm. Front at narrowest point only slightly wider than ocellus, frontal vitta obsolete on about median third. Head black, slightly greyish-white pollinose, cheeks sometimes obscurely reddish. Antenna with first 2 segments and sometimes extreme base of third dark yellow, rest of third very pale yellow. Palpus black, slender, parallel-sided.

Thorax reddish-yellow with black median stripe which extends at most slightly laterad of the dorsocentral bristles and is confluent with a large basal black triangle on the scutellum. Dorsocentral bristles arranged 2 + 4, last 2 somewhat longer than others; prealar present but short and weak; anterior intraalar often absent, if present not longer than preaalar. Anterior declivity of mesopleuron bare; hairs of beret rather short and sparse. Posterior spiracle of moderate size, with 1 distinct black or yellow seta, and sometimes a small seta, in fringe of posterior margin. Vein R_{4+5} with several setae above at base; apex of vein M_{1+2} curved slightly but distinctly forward (Fig. 18). Legs yellow, apex of fore tibia brown, mid and hind tibiae dark brown, tarsi black. Fore tibia with a short but strong anterodorsal bristle; mid femur with 2 or 3 very short anteroventrals near base, with 1 strong posteroventral at 1/3 femoral length and a few weaker posteroventrals before and beyond it; hind femur with an irregular row of anteroventrals of which 1 or 2 on basal third and several near apex are strong, and with 1 moderately strong posteroventral at 1/3 femoral length.

Abdomen reddish-yellow, tergite 2 with a very narrow posterior black band, tergites 3 and 4

each with a wider black posterior band which is usually widened medially and may cover from 1/5 to 2/3 length of the tergite, tergite 5 yellow or obscurely blackened medially. Tergite 4 with 1 or 2 weak discals on each side, with about 8 moderately strong marginals; tergite 5 with moderately strong bristles, 2 or 3 discals on each side. Terminalia (Fig. 24-26): Cercus with long strong hairs on dorsal half, with abundant fine hairs near inner margin on ventral half, entirely covered with minute pile, and with apex very shallowly emarginate; surstylus slightly curved, rather flattened, with slender portion parallel-sided.

♀. Very similar to ♂. Frontal vitta, parafacial and cheek slightly reddish. Palpus slightly broader than in ♂. Anterior intraalar bristle present, moderately strong. Posterior spiracle distinctly smaller than in ♂. Terminalia (Fig. 27-29): Sternite 6 with 2 strong bristles and several minute setae; sternite 7 sclerotized only around base of the 2 strong bristles and several minute setae; otherwise as described above for genus.

Egg (Fig. 30). Anterolateral processes and anteromedian process subequal in length, former with a very irregular margin bearing many small semicircular projections, latter with margin similar but less irregular.

Type locality and type. New Guinea. Lectotype ♂ designated by Pont (1966a); in BMNH. Mr Pont has sent me a ♂ considered by him to be conspecific with the type.

DISTRIBUTION: New Guinea, 0-1650 m.

SPECIMENS EXAMINED (BISHOP, BMNH, CNC, AMS). SW NEW GUINEA: 10 ♂♂, Fak Fak, S coast of Bomberi, Vogelkop, 10-100 m, 11-12. VI. 1959, T. C. Maa & J. L. Gressitt; 1 ♂, 1♀, Bomberi, Vogelkop, 700-900 m, 10. VI. 1959, ex human excrement, Gressitt. NW NEW GUINEA: 1♀, Kebar Val., W of Manokwari, 550 m, 4-31. I. 1962, L. W. Quate; 1 ♂, W of Sentani, Cyclops Mts, Hollandia area, 150-250 m, 19. VI. 1959, ex human excrement, Gressitt; 1 ♂, 1 ♀, Waris, S of Hollandia, 450-500 m, 1-23. VIII. 1959, Maa; 1 ♀, Archbold L., Central Mts, 760 m, 25. XI-3. XII. 1961, S. & L. Quate; 1 ♂, 1 ♀, Ifar, 200-600 m, 22. VI. 1959, ex human excrement, Maa; 1 ♀, Genjam, 40 km W of Hollandia, 100-200 m, 1-10. III. 1960, Maa. NE NEW GUINEA: 1 ♂, 3 ♀♀, Kassam, 48 km E of Kainantu, 1350 m, 30. X. 1959, ex human excrement, Maa; 1 ♀, Karubaka, Swart Val., 1400 m, 6. XI. 1958, Gressitt; 1 ♀, Aiyawa Village, Saidor, Finisterre Range, 16-23. VI. 1958, W. W. Brandt; 1 ♀, Mt Hagen area, 1650 m, 28. VI. 1957, D. E. Hardy; 2 ♂♂, Dreikikir, Sepik District, 350-400 m, 22-24. VI. 1961, J. & M. Gressitt; 1 ♂, 2 ♀♀, Wewak, 2-20 m, 11. X. 1957, Gressitt; 1 ♂, 1 ♀, Maprik, 150 m, 29. XII. 1959-17. I. 1960, Maa; 2 ♂♂, Karimui, 1080 m, 14. VII. 1963, M. Sedlacek; 1 ♀, Busu R., E of Lae, 100 m, 13. IX. 1955, Gressitt; 1 ♀, Mt Kaindi, Wau, 1230 m, 5. X. 1964, J. Sedlacek; 2 ♀♀, Bainyik, S of Maprik, 150 m, 12. I. 1960, Maa; 1 ♀, May R. Patrol Station, Upper Sepik District, 100 m, 29. V. 1963, on human excrement in wet forest, R. Straatman; 1 ♀, same locality, 31. V. 1963, in wet forest, Straatman; 1 ♀, Imbia, nr Maprik, 9. XII. 1963, D. K. McAlpine; 1 ♂, Wau, 1530-1650 m, 14-23. V. 1965, R. W. Crosskey. SE NEW GUINEA: 1 ♂, Tapini, 17-19. V. 1961, Gressitt; 1 ♂, Brown R., 22. V. 1956, E. J, Ford Jr.; 1♂, 1 ♀, Daradae, nr Javarere, Musgrave R., 100 m, 4. X. 1958, ex human excrement, Gressitt; 1 ♀ Cape Rodney, 100 m, 2-4. XI. 1960, Gressitt; 2 ♀♀, between Kokoda and Pitoki, 400 m, 23. III. 1956, Gressitt; 1 ♀, Kokoka, 400 m, 23. III. 1956, Gressitt; 1 ♂, 1 ♀, Kokoda, 366 m, IX-X. 1933, L. E. Cheesman; 1 ♀, Kiunga, Fly R., 11-13. VIII. 1957, W. W. Brandt; 1 ♂, Igora Estate, Popondetta

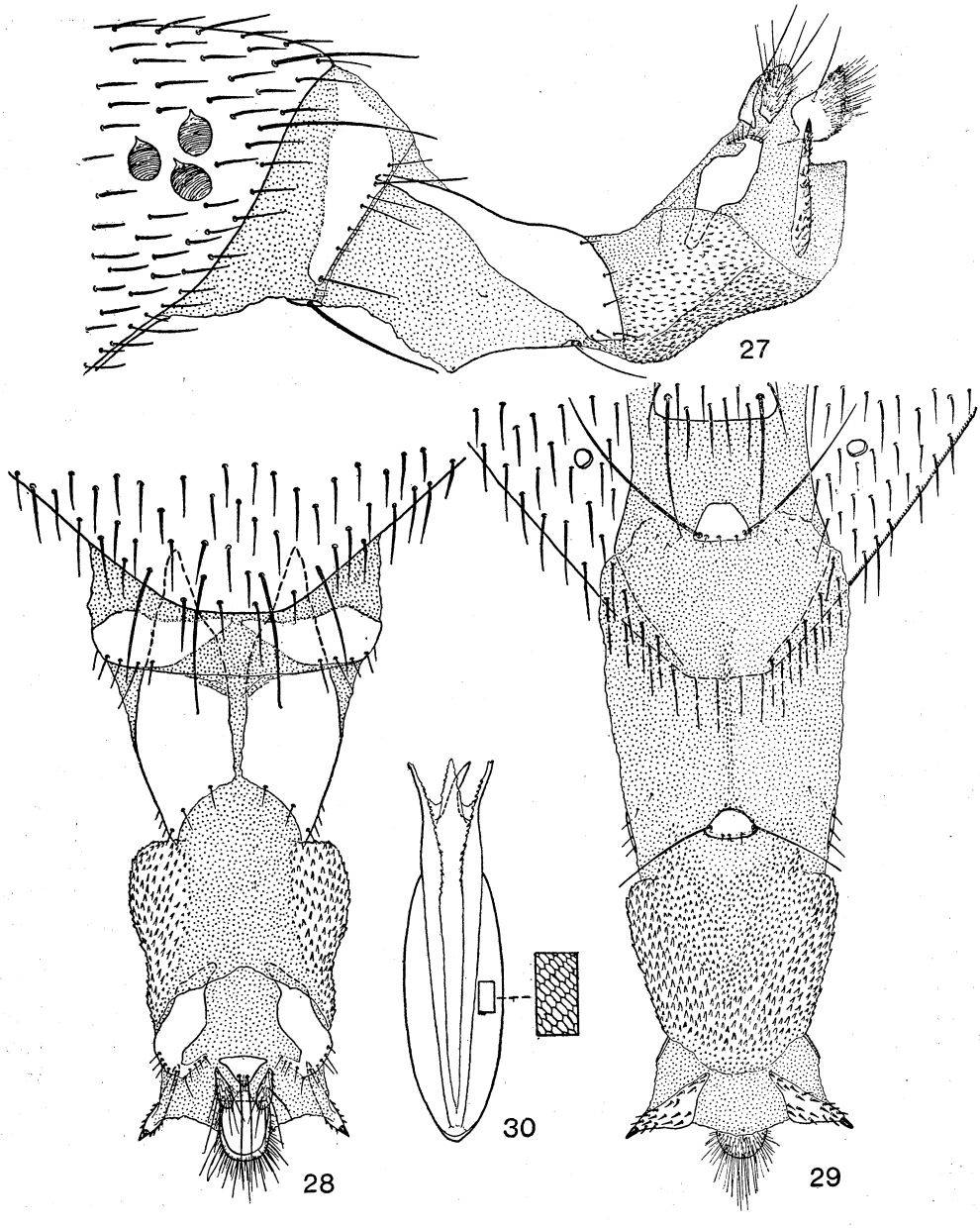

Fig. 27-30. *Gymnopapuaia albicornis* (Walker), ♀: 27, terminalia, lateral; 28, terminalia, dorsal; 29, terminalia, ventral; 30, egg, dorsal, with enlargement of surface markings.

Subdistrict, 2. XI. 1963, McAlpine; 1 ♂, Aroana Estate, Aroa R., 5. XII. 1963, McAlpine; 2 ♀♀, Musgrave R., Central District, 6. V. 1965, Crosskey.

Gymnopapuaia conformis Vockeroth, new species Fig. 31, 32.

♂. Length 6.1 to 6.6 mm. Extremely similar to *albicornis*, with similar variation in width of mesonotal stripe and strength of anterior intraalar bristle, differing as follows: Antennal segment 3 sometimes with extreme apex blackened. Scutellum entirely yellow, without basal black triangle. Terminalia (Fig. 31, 32): Cercus with shorter and weaker hairs on upper half, with fewer and more scattered hairs on lower half, with much of lower half devoid of minute pile, and with apex weakly emarginate to form a shorter lateral process and a longer median process; surstylus with apical half slightly but distinctly broadened.

♀. Length 5.6 to 7.1 mm. Very similar to ♂. Antennal segment 3 blackened on apical 1/3 to 2/3. Terminalia as in *albicornis*.

DISTRIBUTION. New Guinea, 0-1350 m.

Types. Holotype ♂ (BISHOP 9589), Karimui, NE New Guinea, 1080 m, 14. VII. 1963, M. Sedlacek. Paratypes (BISHOP, BMNH, AMS): 1 ♂, same data as holotype; 1 ♂, 1 ♀, Kassam, 48 km E of Kainantu, NE New Guinea, 30.X.1959, ex fresh human excrement, T. C. Maa; 1 ♀, Wau, NE New Guinea, 1200 m, 26. VII. 1961, J. & M. Sedlacek; 1 ♀, same data but 1050 m, 2. X. 1961, J. Sedlacek; 1 ♂, Driomo Govt. Sta., W District, SE New Guinea, 26-28. X. 1960, ex fresh human excrement, J. L. Gressitt; 1 ♂, Aroana Estate, Aroa R., SE New Guinea, 2. XII. 1963, D. K. McAlpine; 1 ♂, Ifar, Cyclops Mts, NW New Guinea, 300-500 m, 29. VI. 1962, ex fresh human excrement, Gressitt.

Gymnopapuaia hypopleuralis (Malloch), n. comb. Fig. 19.

Myiospila hypopleuralis Malloch, 1925, *Aust. Zool.* **3:** 330.

Myospila hypopleuralis, Snyder, 1940, *Am. Mus. Novit.* **1087:** 2.

♀. Length 7.1 mm. Similar to ♀ of *albicornis*, differing as follows: Front, parafacial and cheek paler, distinctly reddish. Antenna yellow-orange throughout. Palpus dark yellow, very slightly broadened from base to just before apex. Thorax entirely reddish-yellow, without trace of dark mesonotal stripe. Anterior intraalar absent; inner (third) postalar weak but distinct. Posterior spiracle slightly larger, with black marginal seta more prominent. Apex of vein M_{1+2} curved strongly forward (Fig. 19). Mid femora missing (according to Snyder 1940 without distinct anteroventrals or posteroventrals). Hind femur with distinct anteroventrals only near apex, without posteroventrals. Abdomen rather discolored, basal half red-orange, apical half mostly grey-brown and lightly grey pollinose. Tergites 4 and 5 each with 1 or 2 weak discals on each side; tergite 4 with 6 moderately strong marginals, tergite 5 with weak marginals. Terminalia not examined.

♂. The detailed description given by Snyder (1940) indicates it is very similar to the ♀. Front apparently as in *albicornis*. Antenna yellow. Fore tibia without anterodorsal bristle. Hind femur with 1 or 2 weak posteroventral bristles near midlength. Abdomen orange-brown with variable orange showing through, densely greyish pruinescent with an indistinct dorsocentral vitta.

Type locality and type. Stannary Hills, North Queensland, Australia, ca 3000' Holotype ♂ in BMNH (Lee, Crust and Sabrosky, 1956).

DISTRIBUTION. Queensland.

SPECIMEN EXAMINED (BISHOP). 1 ♀ paratype, Cairns, Queensland.

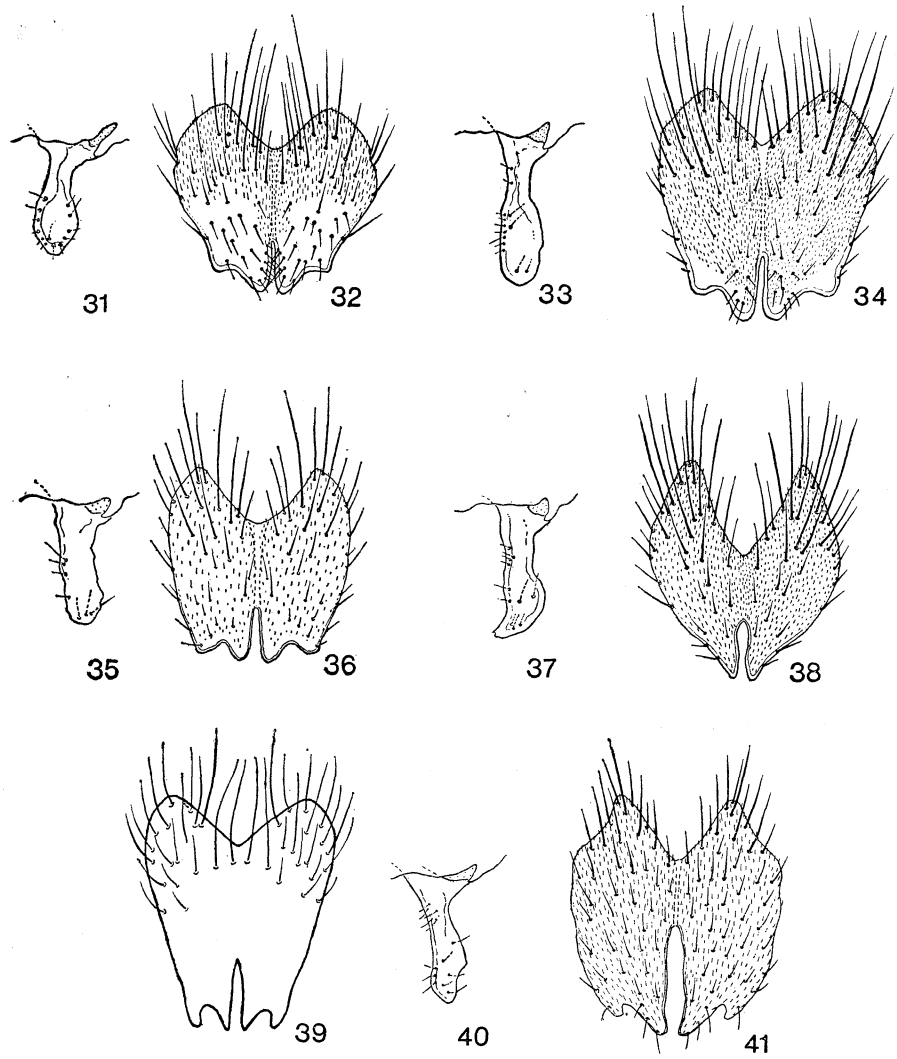

Fig- 31-41. 31, 32, *Gymnopapuaia conformis* n. sp., ♂ holotype: 31, left surstylus, anterolateral; 32, cerci, posterior. 33, 34, *G. palau* (Snyder), ♂: 33, left surstylus, anterolateral; 34, cerci, posterior. 35, 36, *G. clavipalpis* n. sp., ♂: 35, left surstylus, anterolateral; 36, cerci, posterior. 37, 38, *G. acuta* n. sp., ♂ holotype: 37, left surstylus, anterolateral; 38, cerci, posterior. 39, *G. annulata* (Stein), ♂ lectotype, cerci, posterior (pile not shown). 40, 41, *G. aquila* n. sp., ♂ holotype: 40, left surstylus, anterolateral; 41, cerci, posterior.

Gymnopapuaia palau (Snyder), n. comb. Fig. 33, 34.

Myospila palau Snyder, 1965, *Insects Micronesia* **13** (6): 295.

♂. Length 6.6 to 7.7 mm. Very similar to that of *albicornis* but much darker in color, differing as follows: Antenna with apex of segment 3 sometimes very slightly darkened. Palpus with slightly

more than basal half dark brown, remainder pale yellow. Thorax almost entirely blackish-brown, only lateral portions of mesonotum and posterior part of pleura sometimes slightly reddish. First 4 dorsocentrals short but distinct; prealar absent; anterior intraalar very weak or absent; inner (third) postalar present but weak. Pleural hairs mostly pale brown to black. Legs blackish-brown, only fore and mid tibiae yellowish. Mid femur without distinct anteroventrals or posteroventrals, hind femur with 4 or 5 short weak posteroventrals on basal half. Abdomen dark reddish-orange, tergite 2 with broad posterior dark brown band, tergites 3 and 4 each with posterior dark brown band which extends forward to anterior margin of tergite on median 1/3 of dorsum or slightly more; tergite 5 unmarked. Sternite 1 with 1 or 2 pairs of fine hairs. Terminalia (Fig. 33, 34): Cercus with shorter hairs on upper half, with shorter and more scattered hairs on lower half, entirely covered with minute pile except along ventral margin, with shallow apical notch and with lateral process not at all produced ventrad; surstylus with apical half slightly broadened.

♀. Length 6.1 to 7.7 mm. Very similar to ♂. Antennal segment 3 brownish except at base. Palpus slightly broader. Prealar and anterior intraalar short but distinct. Posterior spiracle smaller. Mid tibia dark brown. Tergites 3 and 4 entirely dark brown, in slightly teneral specimens extensively orange on disc. Terminalia: Sternite 6 with 2 strong and a few minute setae; sternite 7 rather short but broad and distinct, with 2 strong and 2 minute apical setae; otherwise as described above for genus.

Type locality and type. Ngiwal, Babalthuap I., Palau Is. Holotype ♂ in USNM.

DISTRIBUTION. Palau Is. (Micronesia).

SPECIMENS EXAMINED (BISHOP). 11 ♂♂, 12 ♀♀, all paratypes, from Koror I., Babelthuap I., Auluptagel I., Ngaiangl Atoll and Kayangell Atoll.

Gymnopapuaia rufiscuta Vockeroth, new species

♂. Length 7.7 mm. Very similar to *albicornis*, differing as follows: Palpus with basal half dark brown, apical half pale yellow and slightly broadened and flattened. Thorax entirely reddish-yellow, without trace of darker mesonotal stripe. First 4 dorsocentrals much shorter than last 2; prealar absent; anterior intraalar present on one side but very weak, absent on other side; 3 postalars, inner one subequal to first postsutural dorsocentral. Legs yellow with distal 2/3 of hind femur, and all tarsi, brown. Mid femur without distinct anteroventrals, with 1 or 2 weak posteroventrals near midlength, hind femur with 1 short anteroventral at 1/3 its length and 1 short posteroventral near midlength. Abdomen reddish yellow; tergite 2 with very narrow dark brown apical band; tergites 3 and 4 with broad triangular dark brown apical bands, that on 3 almost reaching, that on 4 reaching, anterior margin; tergite 5 brownish-black except narrowly anterolaterally. Bristles of tergites 4 and 5 similar to those of *albicornis*, but each tergite with 4 or 5 discals on each side. Sternite 1 with a few very short pale hairs. Terminalia not examined.

♀. Length 6.6 mm. Very similar to ♂. Antennal segment 3 dark yellow basally, brownish on about distal 2/3. Palpus broader, gradually and uniformly broadened from base to just before apex. Prealar present, short; 3 intraalars, first 2 short but distinct. Mid femur with a row of very weak anteroventrals and posteroventrals none of which is outstanding. Abdomen dorsally with first 2 tergites and narrow base of third yellow, otherwise blackish-brown. Terminalia not examined.

DISTRIBUTION. Tanimbar Is.

Types. Holotype ♂ (BISHOP 9590), Larat (Tanimbar Is., Indonesia), IX.1907, F. Muir. Paratype (BISHOP): ♀, same data.

Gymnopapuaia solomonensis Vockeroth, new species

♂. Length 8.2 to 9.7 mm. Similar in structure to *albicornis* but larger, with paler thorax and with better-defined abdominal pattern. Differing from *albicornis* as follows: Palpus with slightly more than basal half dark brown, remainder pale yellow. Thorax reddish-yellow, with blackish median mesonotal stripe which is about half as wide as distance between dorsocentrals and ends just before presutural acrostichal bristles; scutellum unmarked. Prealar very weak or absent; anterior intraalar weak or absent; third (inner) postalar distinct, moderately strong. Scutellum with 6 or 7 strong hairs immediately below marginal bristles. Vein M_{1+2} curved slightly more strongly forward at apex. Mid tibia yellow, hind tibia brown to dark brown. Mid femur with only short weak anteroventrals, with 5 to 8 short but strong posteroventrals on basal half; hind femur with distinct anteroventrals only near apex, with several very short but moderately strong posteroventrals on basal half. Abdomen reddish yellow; tergites 3 and 4 each with a black band on posterior 1/4 or slightly more, the band slightly produced medially; tergite 5 with a similar band on about posterior half. Bristles of tergites 4 and 5 slightly more numerous. Sternite 1 with several fine hairs. Terminalia not examined.

♀. Length 9.2 mm. Very similar to ♂. Antenna dark yellow. Mesonotum without median stripe. Prealar and anterior intraalar bristles moderately strong. Black apical bands of tergites 3 and 4 not produced medially, that of tergite 5 triangularly produced from lateral margins. Terminalia not examined.

DISTRIBUTION. Solomon Is.

Types. Holotype ♂ (BMNH), Tapenanje, Guadalcanal I., 10-23.XII.1953, J. D. Bradley. Paratypes (BISHOP, BMNH): 1 ♂, Jonapau, Guadalcanal I., 29.VI.1956, E. S. Brown; 1 ♀, Kokure, Bougainville I., 690 m, 15.VI.1956, E. J. Ford Jr.

Gymnopapuaia clavipalpis Vockeroth, new species Fig. 20, 35, 36.

♂. Length 5.6 to 7.7 mm. Head as in *albicornis*, palpus slightly but distinctly broader. Thorax yellow with median black mesonotal stripe at most a little wider than space between dorsocentrals and extending to, or almost to, scutellum. Scutellum yellow or rarely with large, obscure or moderately distinct, basal black triangle covering most of disc. Dorsocentrals arranged 2 + 4; prealar very weak to moderately strong, anterior intraalar moderately strong. Pleural hairs yellow; anterior mesopleural declivity usually bare, rarely with few to many hairs; hairs of beret much longer and more abundant than in *albicornis*. Posterior spiracle much larger than in *albicornis*, without seta in posterior fringe. Vein M_{1+2} curved only very slightly forward at apex; base of vein R_{4+5} usually bare above, rarely with 1 seta, below sometimes with setae extending almost to anterior crossvein (Fig. 20). Leg color as in *albicornis* but fore tibia darker, mid and hind femora sometimes dark brown apically. Fore tibia without anterodorsal bristle. Mid femur without distinct anteroventrals, with several weak and 1 strong posteroventral on basal half. Hind femur with an irregular row of anteroventrals of which at least 2 on basal half and several near apex are strong, with 2 or 3 strong posteroventrals on basal half. Abdomen yellow; tergite 2 usually with narrow black posterior band; tergites 3 and 4 with black posterior band of varying width, at least 1/3 length of tergite and usually produced broadly forward medially to cover most of disc of tergite; tergite 5 entirely yellow or partly or entirely blackened. Bristles of tergites 4 and 5 as in *albicornis*. Terminalia (Fig. 35, 36): Cercus with a few moderately long hairs on lower half, minutely pilose except on ventral margin, with shallow apical notch, inner process slightly longer than outer; surstylus of almost uniform width throughout, with weak but distinct anterior angle at midlength.

♀. Length 5.1 to 7.1 mm. Very simliar to ♂. Antenna pale yellow to reddish-yellow. Palpus

distinctly broader, at 3/4 its length about as wide as antennal segment 3. Prealar bristle moderately strong. Terminalia with sternite 7 well developed and elongate, sternites 6 and 7 apically each with several pairs of weak subequal bristles and several slightly shorter hairs.

Egg. Anterolateral processes very slightly shorter than anteromedian process, latter about 1/3 as long as body of egg, margins of processes almost smooth.

DISTRIBUTION. New Guinea (150-1840 m), Bismarck Arch.

Types. Holotype ♂ (BISHOP 9591) Wau, NE New Guinea, 1200 m, 11. X. 1965, J. & M. Sedlacek, Paratypes (BISHOP, BMNH, CNC, AMS): NW NEW GUINEA: 2 ♂♂, Waris, S of Hollandia, 450-500 m, 16-31. VIII. 1959, T. C. Maa; 1 ♂, 3 ♀♀, Wamena, 1700 m, 10-25. II. 1960, Maa. NE NEW GUINEA: 8 ♂♂, 10 ♀♀, Wau, 1200-1250 m, V, VI, X-II, J. & M. Sedlacek, L. W. Quate, P. Shanahan, R. W. Crosskey; 3 ♂♂, 3 ♀♀, Kunai Creek, Wau, 1250-1500 m, 6-26. VIII. 1963, J. & M. Sedlacek; 4 ♂♂, 1 ♀, Karimui, 1080 m, 14. VII. 1963, M. Sedlacek; 1 ♂, Karimui, 1000 m, 8. VI. 1961, J. L. & M. Gressitt; 1 ♀, Wanuma, Adelbert Mts, 800-1000 m, 23. X. 1958, ex human excrement, J. L. Gressitt; 1 ♀, Karubaka, Swart Val., 1300 m, 7. XI. 1958, Gressitt; 1 ♀, Sibog Village, Saidor, Finisterre Range, 6-16. VI. 1958, W. W. Brandt; 1 ♂, 1 ♀, Kassam, 48 km E of Kainantu, 1350 m, 30. X. 1959, Maa; 1 ♀, Dreikikir, Sepik District, 350 m, 23. V. 1961, J. L. & M. Gressitt; 2 ♂♂, Pindui, Huon Penin., 860 m, 22. IV. 1963, Sedlacek; 1 ♂, Maprik, 29. XII. 1959-17. I. 1960, Maa; 1 ♂, Kamang, nr Minj, W. Highlands, 1840 m, 21. V. 1966, Gressitt; 1 ♂, Imbia, nr Maprik, 18. XII. 1963, D. K. McAlpine. SE NEW GUINEA: 1 ♀, Daradae Plantation, 80 km N to Port Moresby, 500 m, 5. IX. 1959, Maa; 1 ♀, Kokoda-Pitoki, 400 m, 23. III. 1956, Gressitt; 1 ♂, 1 ♀, Mt Lamington District, Northern Division, 23-24. VII. 1927, I-II. 1929, C. T. McNamara. BISMARCK ARCH.: 1 ♀, Rabaul, New Britain, 9. VII. 1941, J. L. Froggatt.

DISCUSSION. It is possible that some of the ♀♀ listed above may be specimens of *annulata* (Stein).

Gymnopapuaia acuta Vockeroth, new species Fig. 37, 38.

♂. Length 7.6 mm. Very similar to that of *clavipalpis*, differing as follows: Median mesonotal stripe broader, paler and obscure laterally, extending laterally to posthumeral and anterior intraalar bristles but somewhat narrower at level of suture. Prealar weak but distinct, anterior intraalar moderately strong. Anterior mesopleural declivity bare. Vein R_{4+5} bare above at base. Femora yellow, fore tibia yellow, mid tibia brown, hind tibia dark brown. Fore tibia with anterodorsal bristle. Mid femur on basal half with a row of weak anteroventrals about half as long as femoral diameter, on basal 2/3 with about 8 weak posteroventrals the longest of which is subequal to femoral diameter. Hind femur with an almost complete row of moderately long anteroventrals, with about 4 strong and 2 weaker posteroventrals on basal half. Abdomen reddish-yellow, tergites 3 and 4 each with a narrow, medially-divided, posterior brown band; tergite 5 discolored by abdominal contents but apparently unmarked. Terminalia (Fig. 37, 38): Cercus with a few moderately long hairs on lower half, produced ventrad into a single acute point, only inner margin of this point without minute pile, line of fusion of 2 cerci obsolete; surstylus rather abruptly broadened posteriorly on about apical third and with apex produced very slightly anteroventrad.

♀. Unknown.

DISTRIBUTION. Bismarck Arch.

Holotype ♂ (UZMC), Lavangai, Banatam, Bismarck Arch., 22. III. 1962, Noona Dan Exp. 61-62.

Gymnopapuaia annulata (Stein), n. comb. Fig. 39.

Spilogaster annulata Stein, 1900, *Természetr. Füz.* **23:** 133.

Papuaia annulata, Pont, 1969, *Dt. Ent. Z.*, N. F. **16:** 82.

♂. Length 7.8 mm. Very similar to *clavipalpis*, differing distinctly only in the presence of a short but distinct anterodorsal bristle on the fore tibia and in having a distinctly deeper apical notch in each cercus. Palpus dark brown, very slightly paler on basal half. Thorax yellow with moderately well-defined median blackish-brown stripe extending very slightly laterad of dorsocentrals. Scutellum yellow with large distinct blackish-brown basal triangle. Prealar and intraalars strong. Anterior mesopleural declivity apparently with fine, rather long, pale hairs extending forward almost to spiracle. Posterior spiracle very slightly smaller than in *clavipalpis*. Base of vein R_{4+5} bare above on one side, with 1 small seta on other, below with setae extending about 1/3 distance to anterior crossvein. Hind femur with 2 strong or moderately strong posteroventrals on basal half. Tergite 2 without black posterior band, tergite 3 with black posterior band which is produced broadly and triangularly forward and reaches anterior margin at mid line; tergite 4 with similar band which reaches broadly to anterior margin; tergite 5 yellow. Terminalia (Fig. 39): Cercus apparently with long hairs only on dorsal third, without discernible pile (perhaps visible in macerated specimen), with rather deep apical notch, inner process slightly longer than outer; surstylus apparently of almost uniform width throughout, its shape not clearly discernible in only available specimen. ♀. Unknown.

Type locality and type. Mt Astrolabe, New Guinea. Lectotype ♂, in MCSNG, designated by Pont (1969a).

DISTRIBUTION. New Guinea.

SPECIMEN EXAMINED. 1 ♂ (lectotype).

DISCUSSION. The ♀ of this species will probably be very difficult to distinguish from that of *clavipalpis* n. sp. The only difference between the ♂♂ which might occur also in the ♀♀ is the color of the palpus (black throughout in *clavipalpis*, dark brown and slightly paler on basal half in *annulata*), but this palpal color may not be constant in specimens of *annulata*.

Gymnopapuaia aquila Vockeroth, new species Fig. 40, 41.

♂. Length 6.6 mm. Very similar to that of *clavipalpis*, differing as follows: Black median mesonotal stripe extending laterad to mesonotal bristles and caudad to scutellum. Scutellum dark yellow. Prealar bristle missing, from size of base apparently weak. Presutural acrostichal hairs not distinctly separated from dorsocentrals, a few scattered hairs present on the usual bare stripe. Scutellum with 2 irregular rows of hairs present below marginal bristles. Pleural hairs brown to black; anterior mesopleural declivity with many hairs. Fore tibia yellow, fore and hind femora yellow. Mid legs missing. Hind femur with 3 strong posteroventrals on basal half. Tergite 2 with narrow divided posterior black band; tergite 3 pale only anterolaterally; tergites 4 and 5 entirely shining black. Terminalia (Fig. 40, 41): Cercus elongate, entirely covered with minute pile, with abundant but scattered hairs on lower half, apical notch narrow, forming a slender thumb-like inner process and a short broad outer process; cerci distinctly separated on lower half,

line of fusion short; surstylus with thin posterior flange on apical half. ♀. Unknown.

DISTRIBUTION. Bismarck Arch.

Holotype ♂ (BISHOP 9592), Bainings, St. Paul's, Gazelle Penin., New Britain, 350 m, 4. IX. 1955, J. L. Gressitt.

Gymnopapuaia bicincta (Stein), n. comb.

Spilogaster bicincta Stein, 1907, *Z. Syst. Hymenopt. Dipterol.* **7:** 213.
Mydaea bicincta, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 185.

Mr Pont has sent me a detailed description of the holotype ♂. He refers it to *Papuaia*, but the fragments of the badly broken prosternum are bare, vein R has a few fine setae below just before humeral crossvein, and sternite 1 is bare, so it undoubtedly belongs to *Gymnopapuaia*. The following brief description is extracted from his mss. description:

Length 8.0 mm. Front very narrow. Antenna pale yellow. Palpus yellow, dark brown on basal third, curved and clavate towards apex. Thorax orange-yellow, mesonotum with broad black median vitta from neck to just before suture, extending laterad just beyond dorsocentrals. Dorsocentrals arranged 2 + 4; prealar distinct, half as long as posterior notopleural; anterior intraalar present. Pleural hairs yellow. Hairs of beret numerous, very long and conspicuous. Hind spiracle without marginal seta. Vein R_{4+5} with setae above at base; vein M_{1+2} weakly curved forward at apex. Squamae and margins orange-yellow, fringes pale. Mid legs missing, other legs yellow, tibiae and tarsi brown to blackish-brown. Fore tibia with anterodorsal bristle. Hind femur with 1 strong anteroventral on basal half and 3 or more near apex; with about 6 posteroventrals on basal 2/3, several of which are as long as femoral depth. Abdomen orange-yellow, with a subshining black apical band on tergites 3 and 4 occupying less than half the tergites.

Type locality and type. New Guinea. Holotype ♂ in BMNH.

DISTRIBUTION. New Guinea.

DISCUSSION. I have seen no specimens referable to this species. It is apparently very similar to *multisetosa* n. sp., differing most markedly in the shape and color of the palpus as indicated in the key.

Gymnopapuaia decipiens (Stein), n. comb. Fig. 42, 43.

Mydaea decipiens Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 185; *Nova Guinea* **13:** 204.
Papuaia decipiens, Pont, 1968, *Ent. Ber., Amst.* **28:** 169.

♂. Length 8.0 mm. Head as in *albicornis*. Antenna dark yellow. Palpus not clavate, entirely black. Thorax dark yellow, unmarked. Dorsocentrals arranged 2 + 4; prealar absent; anterior intraalar strong. Pleural hairs partly pale, partly dark. Anterior mesopleural declivity with a few hairs; hairs of beret long, not dense, posterior ones dark. Posterior spiracle large as in *clavipalpis*. Vein R_{4+5} bare above at base, vein M_{1+2} with apex curved slightly but distinctly forward. Fore and mid legs yellow; fore tibia brown except at base; mid tibia dark brown; tarsi black. Hind legs missing. Fore tibia without anterodorsal bristle. Mid tibia with 5 or 6 short but distinct anteroventrals on basal half, with 4 rather long and 2 shorter posteroventrals on basal

half. Abdomen reddish-yellow, unmarked; marginal and discal bristles rather weak. Terminalia (Fig. 42, 43): Cercus entirely covered with minute pile, lower half with a few scattered hairs, apical notch moderately deep forming a slender lateral process and a triangular and slightly longer inner process; surstylus rather stout, very slightly broadened on apical half.

♀. Mr Pont has sent me a detailed description of the lectotype ♀. It is apparently very similar to the ♂ here referred to the species. The following particulars are extracted from Mr Pont's mss. notes: Length 8.0 mm. Palpus brown, rather flattened and thick, weakly clavate. Prealar well developed but short. Hairs of anterior mesopleural declivity not mentioned. Hairs of beret pale. Coxae, trochanters and femora yellow, tibiae and tarsi brown, fore tibia yellow on basal half. Fore tibia with or without anterodorsal bristle. Mid femur with anterodorsals and posterodorsals much as in ♂. Hind femur with a sparse row of 5 anterodorsals longer than femoral diameter along whole length, with 3 to 4 equally long posteroventrals on basal 3/5.

Type locality and type. Noordrivier, New Guinea. Lectotype ♀ (designated by Pont, 1968b) in Zool. Museum, Amsterdam. Mr Pont has sent me a detailed redescription of the lectotype.

DISTRIBUTION. New Guinea.

SPECIMEN EXAMINED (BISHOP). 1 ♂, Brown R., SE New Guinea, 5 m, 23. X. 1960, J. L. Gressitt.

Gymnopapuaia lativittata Vockeroth, new species Fig. 44, 45.

♂. Length 7.1 mm. Head as in *albicornis* but palpus flattened and slightly broadened on apical half, brownish on about basal third, otherwise yellow. Thorax dark yellow; mesonotum with very broad black median stripe which presuturally extends to the posthumeral bristle, is somewhat narrowed at the suture, and laterally extends almost to, or slightly beyond, the supraalar bristle, sometimes with the lateral portion of the postsutural stripe separated anteriorly from the median portion by a yellow area just inside the anterior intraalar. Scutellum with black basal triangle covering most of disc. Dorsocentrals arranged 2 + 4; prealar absent; anterior intraalar strong. Pleural hairs yellow; hairs of beret moderately long but not dense; metepisternum without hairs. Posterior spiracle of moderate size as in *albicornis* but without seta. Vein R_{4+5} bare or with several setae above at base. Apex of vein M_{1+2} curved only very slightly forward. Legs reddish-yellow, mid and hind femora dark brown, tarsi black. Mid femur without distinct anteroventrals, with 1 strong posteroventral near midlength. Hind femur with at most 1 anteroventral on basal half, with several near apex; with 3 or 4 distinct posteroventrals of varying length on basal 2/3. Abdomen reddish-yellow; tergite 2 with at most an obscure dark posterior band; tergites 3 and 4 each with a black posterior band on posterior half or slightly more, the band slightly produced medially and sometimes reaching anterior margin of tergite; tergite 5 black. Tergite 3 with 1 very strong marginal on each side; tergite 4 with 4 very strong marginals, with 1 or 2 weak discals on each side; tergite 5 with 5 or 6 rather weak marginals, with a strong discal on each side. Terminalia (Fig. 44, 45): Cercus unusually broad, entirely covered with minute pile, on lower half with a large, rather flattened, hairless area, apex with a very shallow notch separating a short broad blunt inner process and an even shorter and blunter lateral process; cerci ventrally separated for only a very short distance, the long line of fusion unusually distinct; surstylus with apical half slightly broadened and curved slightly caudad.

♀. Unknown.

DISTRIBUTION. New Guinea, 284-610 m.

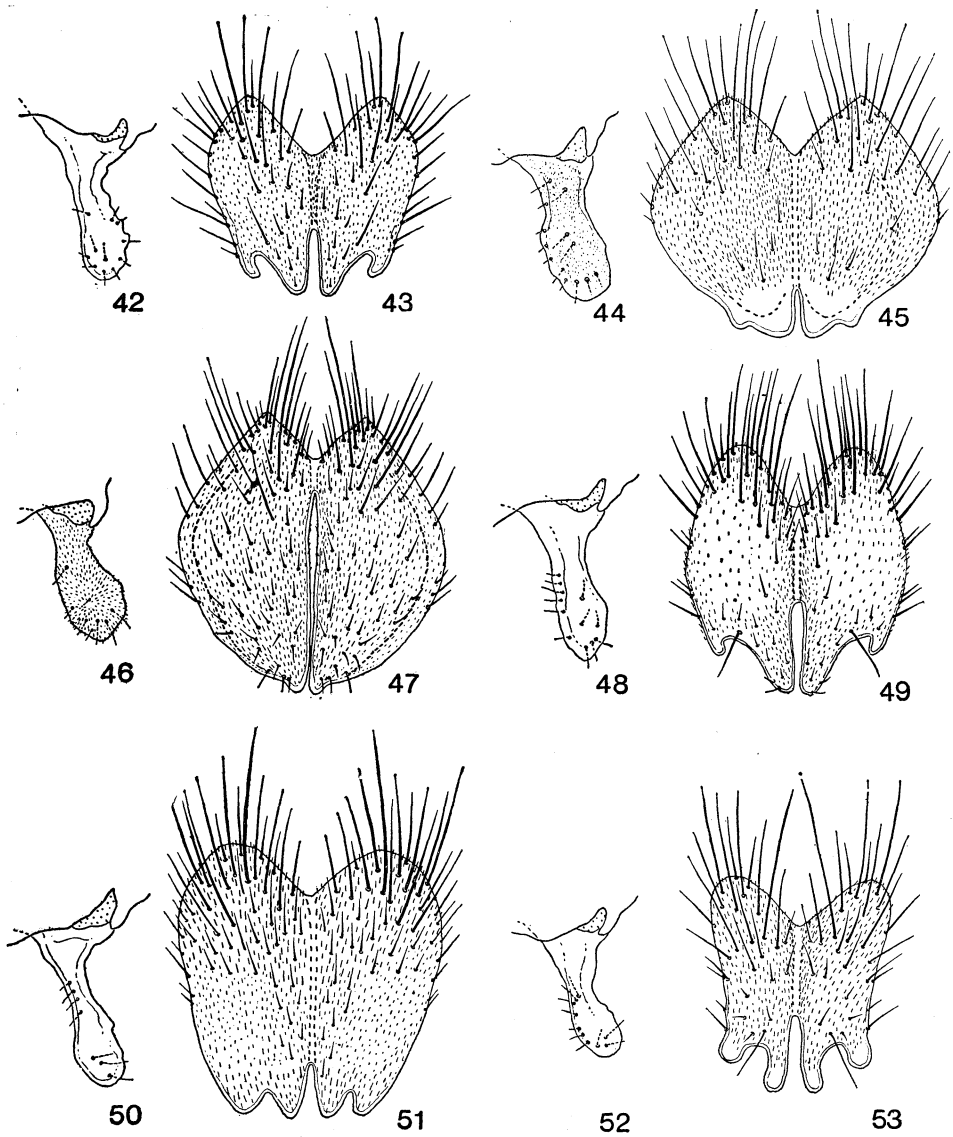

Fig. 42-53. Left surstylus, anterolateral and ♂ cerci, posterior: 42, 43, *Gymnopapuaia decipiens* (Stein); 44, 45, *G. lativittata* n. sp.; 46, 47, *G. multisetosa* n. sp., holotype; 48, 49, *G. quadristriata* (Stein); 50, 51, *G. unisetosa* n. sp., holotype; 52, 53, *G. clivata* n. sp., holotype.

Types. Holotype ♂ (BMNH), Camp 2, Mt Eiori, Japen I., NW New Guinea, 610 m, XI. 1938, L. E. Cheesman. Paratypes (BISHOP, BMNH): 1 ♂, same data as type; 1 ♂, Sabron, Cyclops Mts, NW New Guinea, 284 m, 5. V. 1936, Cheesman.

DISCUSSION. This species may be distinguished from all others treated here by

the reduced number and unusual strength and length of the marginal bristles of tergite 4. A ♂ from Bullumbimbe, Morobe District, NE New Guinea, in BMNH, is extremely similar structurally, but the median mesonotal stripe extends scarcely laterad of the dorsocentrals and the scutellum is yellow; the surstylus appears identical; the cercus is apparently very slightly broader and the apical notch is a very little deeper. I suspect it is of this species but it may be distinct.

Gymnopapuaia multisetosa Vockeroth, new species Fig. 46, 47.

♂. Length 7.4 mm. Similar to that of *clavipalpis*, differing as follows: First lower orbital much longer, as long as antennal segment 3. Palpus rather long and heavy, not broadened towards apex, dark yellow. Thorax (and also abdomen and femora) yellow with extensive reddish areas probably due to discoloration; mesonotum with brown median stripe extending scarcely laterad of dorsocentrals; scutellum unmarked. Prealar moderately strong; anterior intraalar very strong, longer than posterior notopleural. Scutellum with 1 or 2 rows of hairs below marginal bristles. Anterior mesopleural declivity with a few hairs encroaching upon its upper end. Vein R_{4+5} bare above at base. Femora reddish, tibia yellowish (probably darker in mature specimen). Mid femur without anteroventrals, with fine long strong posteroventrals on basal 2/3. Hind femur with a row of anteroventrals which are strong only near apex, with 4 or 5 strong posteroventrals on basal 2/3 followed by several weaker bristles. Abdomen reddish, rather discolored, with narrow brown apical bands on tergites 3 and 4. Tergite 4 with 6 strong marginals; tergite 5 with 1 strong discal on each side. Terminalia (Fig. 46, 47): Cercus elongate, rather swollen, most of lower 2/3 minutely pilose and with very fine scattered hairs, lower end produced into a single broad point with only extreme apex subacute, median margin of cercus strongly infolded, the 2 cerci fused only at extreme dorsal end; surstylus minutely pilose, rather broad, apical half distinctly broadened posteriorly. ♀. Unknown.

DISTRIBUTION. New Guinea.

Holotype ♂ (BISHOP 9593), Nabire, S of Geelvink Bay, NW New Guinea, 0-30 m, 2-9. VII. 1962, J. L. Gressitt.

Gymnopapuaia quadristriata (Stein), n. comb. Fig. 48, 49.

Mydaea quadristriata Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 185; 1919, *Nova Guinea* **13:** 208.

Papuaia quadristriata, Pont, 1968, *Ent. Ber., Amst.* **28:** 172.

♂. Length 8.5 mm. Head as in *albicornis*. Antenna with first 2 segments and extreme base of third orange, remainder of third dark brown. Palpus long, slender, only very slightly broadened on apical half, yellow-brown throughout. Thorax dark yellow; mesonotum with a dark brown stripe on each side of each row of dorsocentrals, lateral stripe slightly shorter and considerably broader than median stripe; scutellum with a brown median stripe which is very narrow basally and broader apically and with anterolateral angles brown; sternopleuron with a brown spot on lower half. Dorsocentrals arranged 2 + 4, first 2 postsuturals long, little shorter than third; prealar absent; anterior intraalar long and moderately strong. Mesonotal hairs unusually long and fine, presutural acrostichals extending sparsely laterad to dorsocentrals so the usual bare strip is almost obliterated. Scutellum with 2 or 3 rows of fine hairs below marginal bristles. Mesopleuron without distinct anterodorsal bristle. Pleural hairs dark; hairs of beret very long and abundant. Posterior spiracle extremely large, larger than in *clavipalpis*. Base of vein R_{4+5} bare above; apex of vein M_{1+2} curved very slightly forward. Margin of upper squama, and inner margin of lower squama, narrowly

brownish. Posterior crossvein very strongly angulate. Legs yellow, tibiae scarcely darker, tarsi brown. Fore tibia without anterodorsal bristle. Mid femur rather hairy below, without distinct anteroventrals, with about 6 long but weak posteroventrals on basal half. Hind femur with a complete row of long but weak anteroventrals, with 3 long and 1 or 2 shorter posteroventrals on basal half. Abdomen dark yellow; tergites 3 and 4 with obscure blackish posterior band which is produced narrowly forward medially and broadly forward laterally; tergite 5 dark. Tergites 4 and 5 with marginals and discals moderately long but weak. Terminalia (Fig. 48, 49): Cercus entirely covered with minute pile, with only short sparse hairs on lower 2/3, apical notch broad and rather deep, inner process much longer than outer; surstylus rather slender, very slightly broadened on apical half.

♀. Length 8.7 mm. Very similar to ♂. Presutural acrostichal hairs slightly less abundant laterally, the normal bare strip with only a few hairs. Prealar present, moderately strong. Spiracle as large as in ♂. Base of vein R_{4+5} sometimes with 1 seta above. Femora with shorter hairs and bristles. Tergite 2 sometimes dark posteriorly; tergite 5 dark only on disc. Terminalia as in *clavipalpis*.

Type locality and type. Hellwiggeb, New Guinea, 2000 m. Holotype ♀, in Zool. Mus., Amsterdam (Pont, 1968b). Mr Pont sent me a detailed redescription of the holotype.

DISTRIBUTION. New Guinea, 2000-2500 m.

SPECIMENS EXAMINED (BISHOP). 1 ♂, Malgi, N side of Mt Giluwe, SE New Guinea, 2500 m, 25-30. VI. 1961, J. L. Gressitt; 1 ♀, Mt Kaindi, NE New Guinea, 2400 m, 27. I. 1963, J. Sedlacek; 1 ♀, Bulldog Road, ca 14 km S of Edie Creek, NE New Guinea, 2405 m, 4-10. VII. 1963, G. A. Samuelson.

Gymnopapuaia unisetosa Vockeroth, new species Fig. 50, 51.

♂. Length 7.9 mm. The single available specimen is rather greasy so the description of color is only approximate. Head as in *albicornis*, but color yellowish. Antenna dull yellow. Palpus slender, yellow. Thorax dull yellow; mesonotum with an obscure brown median stripe extending slightly laterad of dorsocentrals; scutellum unmarked. Dorsocentrals arranged 2 + 4; prealar absent; anterior intraalar moderately strong. Pleural hairs pale; hairs of beret moderately long and abundant. Posterior spiracle moderately large as in *albicornis*, without seta. Vein R_{4+5} bare above, wing margin frayed but apex of vein M_{1+2} apparently curved slightly forward as in *albicornis*. Lower squama with inner margin broadly dark brown; squamae otherwise yellow. Mid legs missing; other legs, including tarsi, dull yellow. Hind femur with moderately strong anteroventrals only near apex, with 1 short but strong posteroventral at 1/3 femoral length. Abdomen dull yellow, tergites 4 and 5 mostly brownish. Tergite 4 with 6 moderately strong marginals, with very weak discals; tergite 5 with 2 moderately strong discals on each side. Terminalia (Fig. 50, 51): Cercus only slightly narrowed below, with only a few short hairs on lower half, entirely covered by minute pile, apical notch moderately deep, separating a slender inner process from a slightly broader outer process; surstylus slender, very slightly broadened on apical half.

♀. Unknown.

DISTRIBUTION. New Guinea.

Holotype ♂ (BISHOP 9594), Wau, NE New Guinea, 1250 m, 14. II. 1963, J. Sedlacek.

Gymnopapuaia clivata Vockeroth, new species Fig. 21, 52, 53.

♂. Length 7.7 mm. Body slender. Head (Fig. 21) similar to that of *albicornis* but brown in

color with occiput dark grey; frontal vitta obliterated only on about 1/6 of frontal length, vibrissal angle produced distinctly forward, and genal bristles much longer, more widely separated and forming a single row, longest one almost as long as major vibrissa. Antenna with first 2 segments and extreme base of third dark orange, rest of third brown. Palpus very slender, very slightly broader toward apex, brown with about apical fourth slightly darker. Thorax brown above, pleura yellow-brown; mesonotum on each side with a dark brown stripe laterad of dorsocentral row, slightly broadened posteriorly but not extending as far laterad as intraalar bristles; scutellum blackish-brown with a broad yellow-brown basal triangle extending narrowly to apex. Dorsocentrals arranged 2 + 3, prealar very weak but distinct; anterior intraalar very long. Presutural acrostichal hairs long, in about 5 very irregular rows. Pleural hairs dark, very sparse; hairs of beret short; metepisternum bare. Posterior spiracle very large. Vein R_{4+5} bare above at base, with very fine setae below; vein M_{1+2} only very slightly curved forward at apex; posterior crossvein only slightly bent. Squamae pale brown, margins and fringe brown. Legs dark yellow, mid and hind femora brownish on apical fourth, tarsi dark brown. Fore tibia without anterodorsal bristle, with strong posterior bristle at mid-length. Mid femur without distinct anteroventrals, with an entire row of posteroventrals which are long basally and decrease in length apically. Hind femur with complete row of anteroventrals of which 2 on basal half and 2 near apex are strong, with 2 or 3 long posteroventrals on basal half. Abdomen yellow-brown, tergites 3 to 5 obscurely darker posteriorly. Tergite 4 with several very weak discals on each side, with about 10 long but rather weak marginals; tergite 5 with an entire row of about 8 long discals, with an entire row of long marginals. Terminalia (Fig. 52, 53): Cercus rather slender, entirely covered with minute pile, lower 2/3 with only a few scattered hairs, apical notch rounded and moderately deep, separating a short broader outer lobe from a longer and more slender inner lobe; surstylus distinctly broadened on about apical third.

♀. Length 5.6 to 7.1 mm. Very similar to ♂. Posterior spiracle smaller. Fore tibia without anterodorsal bristle. Mid femur with posteroventrals scarcely distinguishable; hind femur, on basal half, with only 1 strong anteroventral. Terminalia: Sternite 7 well developed, elongate; sternites 6 and 7 apically each with 1 pair of moderately strong bristles and a few short or minute hairs; otherwise as described above for genus.

Egg. Anterolateral and median filaments equal in length, 1/4 as long as body of egg, tapering rapidly and uniformly from base to apex. Margins of filaments almost smooth.

DISTRIBUTION. New Guinea, 2350-2550 m.

Types. Holotype ♂ (BISHOP 9595), Mt Kaindi, NE New Guinea, 2350 m, 6. IV. 1966, J. L. Gressitt. Paratypes (BISHOP, BMNH): 3 ♀♀, Mt Giluwe, SE New Guinea, 2550 m, 27. V.-6. VI. 1963, J. Sedlacek.

Gymnopapuaia laterohirta Vockeroth, new species

♀. Length 7.1 to 7.6 mm. Very similar to that of *clivata*, differing as follows: Body slightly more robust. Vibrissal angle slightly less prominent. Palpus uniformly brown throughout. Mesonotum with dark submedian stripe broader, especially posteriorly, extending mediad of dorsocentrals beyond level of second presutural dorsocentral, divided in extreme posterior view by a grey pollinose stripe extending along dorsocentrals, this stripe widest and most distinct between last 2 dorsocentrals. Presutural acrostichal hairs slightly shorter and more abundant, in about 8 irregular rows. Scutellum with 2 irregular rows of fine hairs below marginal bristles. Vein R_{4+5} with several setae above at base; vein M_{1+2} with apex curved slightly more strongly forward. Wing membrane sometimes very obscurely clouded in center of larger cells. Femora not darkened at apex. Fore tibia with strong anterodorsal bristle. Abdomen yellow-orange; tergite 3 with broad black posterior band which usually extends to anterior margin of tergite on about median fourth;

tergite 4 mostly black, with narrow yellowish median areas anteriorly. Terminalia as in *clivata*.

♂. Unknown.

Egg. Anterolateral and median filaments equal in length, 1/3 as long as body of egg. Margins of filaments moderately uneven.

DISTRIBUTION. New Guinea, 1750-2405 m.

Types. Holotype ♀ (BISHOP 9596), Bulldog Road, ca 14 km S of Edie Creek, NE New Guinea, 2405 m, 1-10. VII. 1966, G. A. Samuelson. Paratypes (BISHOP, BMNH): 2 ♀♀, Wau, NE New Guinea, 1750 m, 29. IX. 1965, J. & M. Sedlacek; 2 ♀♀, Edie Creek, Wau, 2000 m, 14. VIII. 1963, P. Shanahan.

Gymnopapuaia sexvittata Vockeroth, new species

♀. Length 7.5 to 8.2 mm. Very similar to that of *clivata*, differing as follows: Vibrissal angle a little more strongly produced. Palpus very slightly broader toward apex. Mesonotum with longitudinal dark stripe just outside dorsocentrals divided behind suture, an outer branch running along intraalar bristles and fused with inner branch just before scutellum; inner branch broadened posteriorly and with an anterior spur on anterior half of postsutural area, spur extending forward to or just past suture, so that between first and second postsutural dorsocentrals 6 longitudinal stripes are present. Median pale mark of scutellum narrow, parallel-sided. Lower posterior sternopleural bristle only slightly farther from anterior than from upper posterior bristle. Fore tibia with weak but distinct anterodorsal bristle. Abdomen with tergites obscurely or distinctly darkened posteriorly, sometimes with a dark median stripe. Terminalia as in *clivata*. ♂. Unknown.

Egg. As in *clivata* but filaments only 1/6 as long as body of egg.

DISTRIBUTION. New Guinea, 2000-2800 m.

Types. Holotype ♀ (BISHOP 9597), Mt Giluwe, SE New Guinea, 2550 m, 27. V.-6. VI. 1963, J. Sedlacek. Paratypes (BISHOP, BMNH, CNC): 6 ♀♀, same data as holotype; 1 ♀, Daulo Pass, Asaro-Chimbu div., NE New Guinea, 2800 m, 14. VI. 1955, J. L. Gressitt; 1 ♀, Edie Creek, 14 km SW of Wau, NE New Guinea, 2000 m, 13. II. 1962, Sedlacek.

Gymnopapuaia precaria Vockeroth, new species Fig. 54, 55.

♂. Length 7.6 mm. Head as in *albicornis*. Antenna yellow, segment 3 obscurely darkened at apex. Palpus slender, very slightly broadened toward apex, brown throughout. Thorax dark yellow, mesonotum and scutellum brownish, without distinct markings. Dorsocentrals arranged 2+3; prealar scarcely distinguishable, anterior intraalar moderately strong and long. Pleural hairs brown to black; hairs of beret moderately long but not dense. Posterior spiracle large, as in *clavipalpis*. Vein R_{4+5} bare above at base. Vein M_{1+2} curved slightly but distinctly forward at apex. Squamae, including margins and fringes, pale brown. Legs dark yellow, tarsi brownish. Mid femur without anteroventral bristles, with 1 strong but rather short posteroventral just before midlength. Hind femur with anteroventrals only near apex, with 2 strong but very short posteroventrals on middle third. Abdomen yellow-brown, rather darker posteriorly but without distinct markings. Discals of tergite 4 weak, other bristles of tergites 4 and 5 moderately strong. Terminalia (Fig. 54, 55): Cercus rather slender, covered with minute pile except on apical processes, hairs on lower half moderately long but not abundant, mostly near inner margin, apical notch

moderately deep, inner process slightly longer than outer; surstylus scarcely broadened on apical half.

♀. Length 7.6 to 8.2 mm. Very similar to ♂. Antenna with first 2 segments orange-brown, third dark brown. Palpus moderately broadened towards apex, distinctly clavate, basal 1/3 to 1/2 brown, remainder blackish-brown. Posterior spiracle slightly smaller. Hind femur with only 1 posteroventral. Terminalia as in *clivata*.

DISTRIBUTION. New Guinea, 1750-2000 m.

Types. Holotype ♂ (BMNH), Aiyura, NE New Guinea, ca 1750 m, 27. IX. 1957, J. Smart. Paratypes (BISHOP, BMNH): 1 ♀, same data as holotype; 1 ♀, Edie Creek, Wau, NE New Guinea, 2000 m, 14. VIII. 1963, P. Shanahan.

DISCUSSION. Two ♂♂ (BISHOP), both in very poor condition, may be of this species. Both have the cerci and surstyli almost exactly as in the holotype of *precaria*, but both have a distinct, moderately strong prealar bristle and lack the anterodorsal fore tibial bristle. One, from Edie Creek, Wau, NE New Guinea, 1891 m, has a faint darker stripe along each row of dorsocentrals, has the wings frayed (so the apex of vein M_{1+2} is absent on both sides), and has a long anteroventral and a long posteroventral bristle on the hind femur. The other, from Mt Piora, NE New Guinea, 1900 m, has the apex of vein M_{1+2} curved less strongly forward, has about 3 long posteroventrals on the mid femur, and has 2 long anteroventrals and 1 long and several shorter posteroventrals on the basal half of hind femur.

One ♀ (BISHOP), Enarotali, Wisselmeren, NW New Guinea, 1900 m, may also belong here but the palpus is moderately broad throughout but scarcely clavate and the inner margin of the lower squama is dark brown, much darker than the outer margin.

G. precaria n. sp. is superficially very similar to *Papuaiella ponti* n. sp., but the strong dark hairs on the upper margin of the pteropleuron in the latter species are, of course, lacking in all species of *Gymnopapuaia*.

Gymnopapuaia marginisquama (Stein), n. comb.

Spilogaster marginisquama Stein, 1900, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **40**:2.

Mydaea marginisquama, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16**:183.

Papuaia marginisquama, Pont, 1966, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **76**:99.

Mr Pont has sent me a detailed description of the lectotype ♀. The prosternum is bare and vein R has a few weak setae below before humeral crossvein so it undoubtedly belongs to *Gymnopapuaia*. The following brief description is extracted from his mss. description.

Length 8.0 mm. Antenna yellow with apical half of segment 3 deeply infuscated. Palpus yellow, rather flattened and thick, weakly clavate. Thorax yellow in ground color, most of mesonotum inside posthumeral and supraalar bristles infuscated, weakly so at first, increasing in intensity mesad to a broad black median vitta just inside dorsocentrals from neck to scutellum, but without any striking contrast in coloration; mesonotum viewed from behind with a median presutural area brownish-grey pollinose; scutellum brownish. Dorsocentrals arranged 2 + 3; prealar well developed but short; anterior intraalar well developed. Presutural acrostichal hairs in 7 rows. Scutellum without hairs below marginal bristles. Pleural hairs mostly black, those of hypopleuron pale; hairs

present on metepisternum. Lower posterior sternopleural bristle only slightly farther from anterior than from upper posterior bristle. Posterior spiracle without seta. Vein R_{4+5} bare above at base; vein M_{1+2} very weakly curved forward at apex. Squamae dirty white; margins, especially of lower one, dark brown; fringes pale to dark. Legs yellow, tarsi black. Fore tibia with anterodorsal bristle. Mid femur without anteroventrals, with 1 short posteroventral at 2/5 femoral length. Hind femur with anteroventrals only near apex, without posteroventrals. Abdomen damp and dirty, appearing wholly dark, bristles of tergites 4 and 5 weak. Sternite 1 apparently bare.

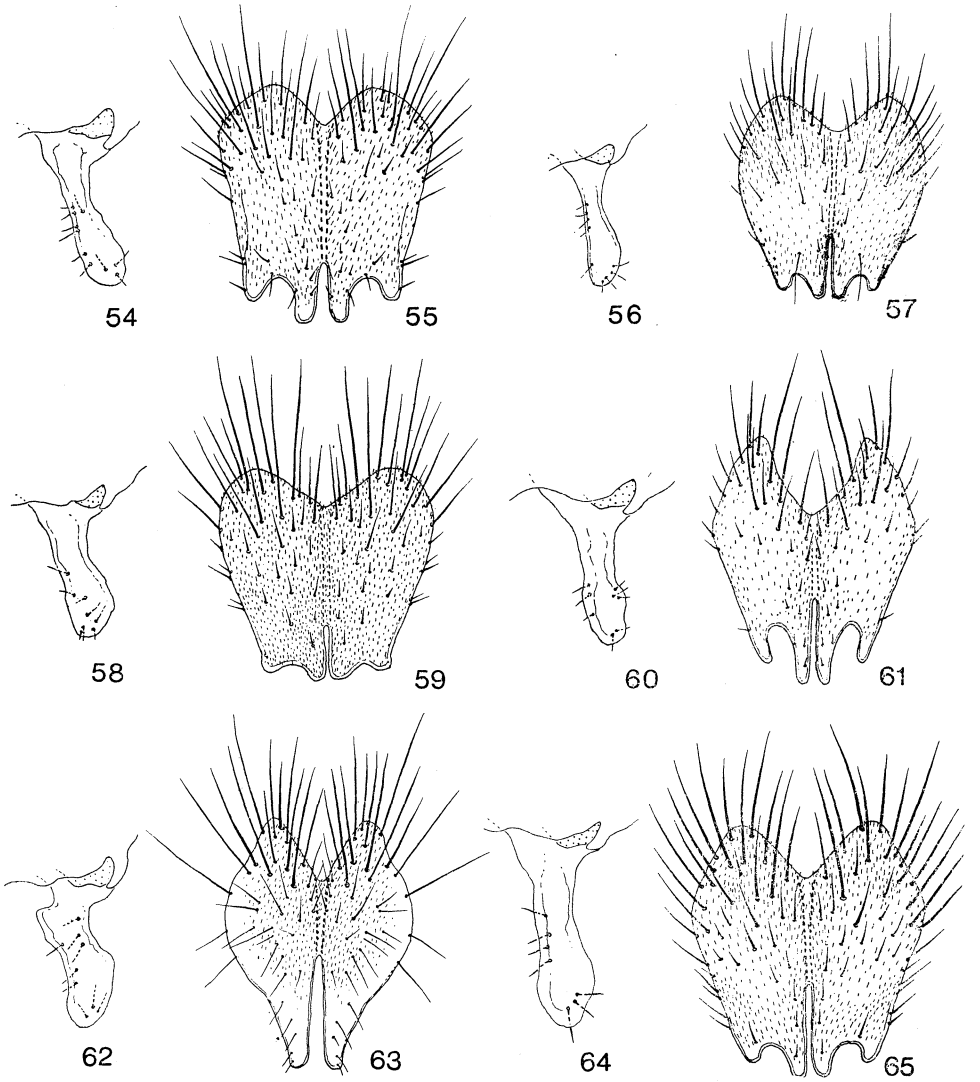

Fig. 54-65. Left surstylus, anterolateral and ♂ cerci, posterior: 54, 55, *Gymnopapuaia precaria* n. sp., holotype; 56, 57, *G. diffidentia* n. sp., holotype; 58, 59, *G. brunneisquama* n. sp., holotype; 60, 61, *G. paula* n. sp.; 62, 63, *G. feminina* n. sp., holotype; 64, 65, *G. magnicornis* n. sp.

Type locality and type. Moroka, SE New Guinea, 1300 m. Lectotype ♀ (designated Pont, 1966b) in MCSNG.

DISTRIBUTION. New Guinea.

DISCUSSION. The ♀ described above may be conspecific with either *diffidentia* n. sp. or *brunneisquama* n. sp., but the characters given in the key suggest that it is probably distinct. Stein's original description of the ♂ of *marginisquama* stated that the squamae were yellow with a rather broad black inner margin on the lower one. This specimen is apparently lost. I suspect that the ♀ syntype, designated by Pont as lectotype, with squamae less distinctly margined, may not be conspecific with Stein's ♂. I have seen no specimens that agree with Pont's mss. description of the lectotype.

Gymnopapuaia diffidentia Vockeroth, new species Fig. 56, 57.

♂. Length 7.7 mm. Head as in *albicornis*. Antenna pale yellow. Palpus slender, yellow-brown. Thorax yellow; mesonotum with a rather well-defined, blackish-brown entire median stripe, in extreme posterior view with a median patch of pale grey pollen covering all the presutural acrostichal hairs. Scutellum yellow. Dorsocentrals arranged 2 + 3; prealar absent; anterior intraalar long, moderately strong. Presutural acrostichal hairs short, subappressed, in about 7 irregular rows. Pleural hairs yellow. Posterior spiracle rather small, about size of that of *albicornis*. Vein R_{4+5} bare above at base; vein M_{1+2} curved only very slightly forward at apex. Squamae pale yellow, entire inner margin of lower one dark brown. Legs yellow, tarsi brown. Fore tibia with or without weak anterodorsal bristle. Mid femur without anteroventrals, with 1 short but distinct posteroventral at 1/3 femoral length. Hind femur with anteroventrals only near apex, with 1 short but distinct posteroventral at 1/3 femoral length. Abdomen yellow, posterior part of tergite 3 and most of tergites 4 and 5 brownish on disc. Tergite 4 without discals, with about 8 moderately strong marginals; tergite 5 with 2 or 3 strong discals on each side and a row of marginals. Terminalia (Fig. 56, 57): Cercus with minute pile on entire surface except apical processes, hairs on lower 2/3 very short and sparse, apical notch shallow, processes equal in width but the inner one very slightly longer than outer; surstylus rather slender, slightly but distinctly broadened on apical half.

♀. Length 7.2 to 7.6 mm. Very similar to ♂. Antenna pale brownish on apical half of outer surface and at apex of inner surface. Palpus slightly broader throughout, yellow-brown to brown. Scutellum yellow or with disc slightly brownish. Lower sternopleural bristle only slightly farther from upper anterior than from upper posterior bristle. Posterior spiracle slightly smaller. Terminalia as in *clivata*.

Egg. Very similar to that of *laterohirta*.

DISTRIBUTION. New Guinea, 1200-1400 m.

Types. Holotype ♂ (BISHOP 9598), Kiambavi Village, Saidor, Finisterre Range, NE New Guinea, 1400 m, 22-29. VII. 1958, W. W. Brandt. Paratypes (BISHOP): 1 ♀, Wau, NE New Guinea, 1200 m, 21. IV. 1962, J. Sedlacek; 1 ♀, Mt Missim, NE New Guinea, 1400 m, 24. IX. 1964, M. Sedlacek; 1 ♀, Kassam, 48 km E of Kainantu, NE New Guinea, 1350 m, 7. XI. 1959, T. C. Maa.

DISCUSSION. This species may be a synonym of *marginisquama* (Stein), although the differences given in the key suggest that they may be distinct. A ♀ specimen (BISHOP), from Kumur, Upper Jimmi Valley, NE New Guinea, 1000 m, may belong here, but I suspect it represents a distinct species. It is very similar to the ♀♀ described

above and has the lower squama similarly marked, but the dark mesonotal stripe is divided by a median yellow line as wide as the area occupied by the acrostichal hairs anteriorly but tapering to a point posteriorly, the scutellum has a narrow median dark stripe, and the hind femur has a distinct anteroventral bristle at 1/3 the femoral length.

Gymnopapuaia brunneisquama Vockeroth, new species Fig. 58, 59.

♂. Length 7.2 mm. Similar to that of *diffidentia*, differing as follows: Palpus very slightly broadened on apical half. Median mesonotal stripe very sharply defined, extending laterad of dorsocentral bristles only in front of second presutural dorsocentral, without distinct pollinose presutural area. Anterior intraalar rather short and weak. Vein M_{1+2} curved slightly more strongly forward at apex in holotype but not in paratype. Squamae pale brown, entire margin of upper one and inner margin of lower one slightly but distinctly darker brown. Legs yellow; mid femur sometimes distinctly brownish on apical half anteriorly and on apical fourth posteriorly; hind femur sometimes dark brown on apical 1/6; mid and hind tibiae, and all tarsi, dark brown. Fore tibia without anterodorsal; mid and hind femora each with 1 or several short weak bristles preceding the strong posteroventral. Abdomen bright yellow; tergite 2 with darkened posterior incisure; tergite 3 with black posterior band, very narrow laterally but triangularly produced medially almost to base; tergite 4 with a similar but much broader band which reaches tergal base; tergite 5 black, slightly reddish only anterolaterally. Bristles of tergites 4 and 5 stronger. Terminalia (Fig. 58, 59): Similar to those of *diffidentia* but cercus entirely covered with minute pile and with more shallow and broader apical notch, and surstylus slightly less broadened on apical half.

♀. Unknown.

DISTRIBUTION. New Guinea, 1068-1373 m.

Types. Holotype ♂ (BMNH), Kumdaurong, Morobe District, NE New Guinea, 1373 m, XI. 1963, B. McMillan. Paratype (BMNH): ♂, Cyclops Mts, NW New Guinea, 1068 m, III. 1936, L. E. Cheesman.

Gymnopapuaia paula Vockeroth, new species Fig. 22, 60, 61.

♂. Length 4.1 to 4.3 mm. Head (Fig. 22) black, face, parafacial and upper part of cheek yellowish; front subshining, occiput slightly grey pollinose, lower part of parafrontal, parafacial and facial ridges shining silvery pollinose. Front parallel-sided on upper 3/5, slightly broader below, at narrowest point 1/4 head width, on each side with 1 long and 2 or 3 shorter lower orbitals and 1 short and 1 long upper orbital. Inner verticals long and strong; outer verticals and postocellars shorter and weaker but distinct. Antenna only slightly enlarged, segment 3 just over 4 × as long as 2; first 2 segments and about basal 1/3 of third yellow-orange, rest of third slightly brownish. Palpus slightly broadened from base to just before apex, basal half yellow, apical half brown. Thorax yellow; disc of mesonotum slightly brownish but without distinct markings. Dorsocentrals arranged 2 + 3; prealar absent; anterior intraalar moderately long. Presutural acrostichal hairs in about 7 irregular rows. Hairs of pleura pale or dark, those of beret pale, rather long, very few in number. Metepisternum without hairs. Lower sternopleural bristle scarcely farther from anterior than from upper posterior bristle. Posterior spiracle small. Vein R_{4+5} bare above at base; vein M_{1+2} curved only very slightly forward at apex; posterior crossvein nearly straight. Legs yellow, tarsi slightly brownish. Fore tibia without anterodorsal bristle. Mid femur without distinct anteroventrals or posteroventrals; hind femur with anteroventrals only near apex, with 1 distinct posteroventral just before midlength. Abdomen yellow; tergite 5, and sometimes tergite 4, obscurely brownish on disc. Tergite 4 with a weak discal on each side, with 6 moderately strong marginals; tergite 5 with 3

moderately strong discals on each side, with 6 marginals. Terminalia (Fig. 60, 61): Cercus covered with minute pile except on apical processes, hairs of lower half mostly near inner margin, apical notch deep and rather broad, processes slender, inner one slightly longer and slightly more slender than outer; surstylus with apical half distinctly broadened.

♀. Length 4.3 to 4.6 mm. Very similar to ♂. Mesonotum sometimes with disc slightly darker. Lower sternopleural bristle equidistant from other 2. Fore tibia with anterodorsal. Terminalia as in *clivata*.

DISTRIBUTION. New Guinea (450-1500 m), Bismarck Arch. (220 m).

Types. Holotype ♂ (BISHOP 9599), Wau, NE New Guinea, 1200 m, 28-30. VI. 1962, light trap, J. Sedlacek. Paratypes (BISHOP, BMNH): 1 ♂, 2 ♀♀, Wau, 1200 m, IV, VIII and XII, Sedlacek; 1 ♂, Wau Creek, Wau, 1200-1500 m, 6. V. 1963, Sedlacek; 1 ♂, Waris, S of Hollandia, NW New Guinea, 450-500 m, 24-31. VIII. 1959, ex human excrement, T. C. Maa; 1 ♀, Illugi, Upper Warangoi, Gazelle Penin., New Britain, 220 m, 15. XII. 1962, Sedlacek.

Gymnopapuaia feminina Vockeroth, new species Fig. 62, 63.

♂. Length ca 4.3 mm. Head as in *paula* but front nearly parallel-sided throughout, just under 1/3 head width; orbitals and verticals mostly abraded but apparently as in *paula*. Antenna long and slender, segment 3 about 5 × as long as 2; first 2 segments orange-brown, third dark brown. Palpus slightly broadened toward apex, yellow-brown. Thorax yellow, disc of mesonotum and scutellum very slightly brownish. Dorsocentrals arranged 2 + 3, prealar short but strong; anterior intraalar long. Presutural acrostichal hairs in 3 to 4 irregular rows. Pleural hairs pale or dark, those of beret pale and few in number. Metepisternum not visible. Lower sternopleural bristle scarcely farther from anterior than from upper posterior bristle. Vein R_{4+5} with 1 seta above at base; vein M_{1+2} curved very slightly forward at apex; posterior crossvein straight. Legs yellow, tarsi dark brown. Fore tibia without anterodorsal bristle, with strong posterior bristle at about midlength. Mid femur without anteroventrals, with 2 weak but distinct posteroventrals on basal third. Hind femur with anteroventrals only near apex, with a rather strong posteroventral at 1/3 femoral length. Abdomen yellow, unmarked. Tergite 4 without distinct discals, with about 4 rather strong marginals; tergite 5 with 2 strong discals on each side, with 6 moderately strong marginals. Terminalia (Fig. 62, 63): Cercus elongate, with minute pile on upper third and inner portion of middle third, marginal hairs on upper half very long and rather sparse, rest of surface with rather abundant shorter hairs, apex without notch but produced ventrad into a long blunt point; surstylus abruptly broadened anteriorly just beyond base, slightly broadened on apical half.

♀. Unknown.

DISTRIBUTION. New Guinea.

Holotype ♂ (BISHOP 9600), Kassam, 48 km E of Kainantu, NE New Guinea, 1350 m, 30.X.1959, ex fresh human excrement, T. C. Maa.

DISCUSSION. This species is superficially very similar to *paula* because of the broad ♂ front and elongate antenna. The presence of a strong posterior bristle on the fore tibia, the very different cercus, and the peculiar surstylus, which differs markedly from that of any other species of the genus, suggest that *feminina* may not be closely related to *paula*.

Gymnopapuaia magnicornis Vockeroth, new species Fig. 23, 64, 65.

♂. Length 6.1 mm. Head (Fig. 23) black, silvery pollinose, shining only on either side of ocellar triangle, face much paler, lower median part of occiput pale yellow. Front at narrowest point about 1/7 width of head, at level of anterior ocellus about 1/5 width of head; at narrowest point frontal vitta almost twice as wide as parafrontal at same point or as ocellar triangle; anterior end of front raised well above level of eye; parafrontals distinctly oblique. Front on each side with 4 lower frontals curved mediad and slightly caudad and 2 reclinate upper frontals, these bristles not varying greatly in size but uppermost one being longest and strongest. Vertical and postocellar bristles long and slender, scarcely distinguishable from the unusually long upper postocular hairs. Face rather strongly receding below level of antennal bases, rather deeply depressed to accommodate the very large antennae; hairs of facial ridge rather long, curved, and conspicuous, in a single dense row extending about halfway to antennal base, longest one about as long as dorsal bristle of antennal segment 2. Eye with hairs very short and sparse but distinctly more conspicuous than usual. Antenna bright yellow, based at about 2/3 head height, segment 3 very long and broad, about 7 × as long as 2. Palpus short, slightly curved, slender basally and slightly but uniformly broadened almost to apex, basal half brown, remainder dark yellow. Thorax bright yellow; mesonotum with well-defined black median stripe which usually extends laterad of dorsocentrals only near anterior and posterior ends of mesonotum and is connected posterolaterally with posterior end of a much narrower postsutural black stripe which lies on and laterad of intraalars; rarely this median stripe entirely confined by dorsocentral rows except anteriorly and completely absent along intraalars. Scutellum with apical 2/5 or less dark brown, or entirely yellow. Dorsocentrals arranged 2 + 3; prealar hairlike, scarcely distinguishable; anterior intraalar long but rather weak. Mesonotal hairs unusually long and abundant, presutural acrostichals apparently in about 6 irregular rows. Pleural hairs yellow, those of beret moderately long and abundant. Posterior spiracle very small, almost circular. Vein R_{4+5} bare above at base; vein M_{1+2} slightly but distinctly curved forward at apex; posterior crossvein nearly straight. Legs yellow, mid and hind tibiae brown, tarsi dark brown. Fore tibia without anterodorsal bristle. Mid femur without distinct anteroventrals, with about 6 very fine short posteroventrals on basal half. Hind femur with an entire row of anteroventrals which are extremely fine and short except at apex, with 2 to 5 weak posteroventrals on basal half, longest one about as long as femoral diameter. Abdomen yellow, tergite 2 sometimes narrowly black posteromedially, tergites 3, 4 and 5 each with a posterior black band of uniform width covering from slightly more to slightly less than half the tergite. Tergite 4 with 1 weak discal on each side, with 6 strong marginals; tergite 5 with 2 strong discals on each side, with 4 strong marginals. Terminalia (Fig. 64, 65): Cercus entirely covered with minute pile, hairs on lower half few in number and mostly near inner margin, apical notch shallow, inner process distinctly longer than outer; surstylus with apical half very slightly broadened.

♀. Length 5.6 to 5.8 mm. Very similar to ♂, differing as follows: Face less receding below, hairs of facial ridge much shorter but still more distinct than usual. Antenna much less broadened, moderately elongate, segment 3 about 4-1/2 × as long as 2. Palpus rather strongly broadened towards apex, narrowly brown at base, otherwise bright yellow. Thorax usually with median dark stripe lying within dorsocentrals except anteriorly and with sublateral stripe narrow, lying over intraalars, and widely separated from median stripe throughout; in specimen from Wau, median stripe narrower than dorsocentral area, and sublateral stripe absent. Scutellum yellow or with brown basal triangle covering most of disc. Lower sternopleural bristle as far from upper posterior as from anterior bristle. Hind femur with 1 or 2 anteroventrals on basal half distinctly longer than others, with 2 weak but moderately long posteroventrals on basal half. Abdomen with tergite 5 entirely yellow. Terminalia as in *clivata*.

DISTRIBUTION. New Guinea, 100-1098 m.

Types. Holotype ♂ (BMNH), Nineia, Morobe District, NE New Guinea, 458 m, V. 1960, B. McMillan. Paratypes (BISHOP, CNC) (mostly in very poor condition): 1 ♂, 1 ♀, Genjam, 40 km W of Hollandia, NW New Guinea, 100-200 m, 1-10. III. 1960, T. C. Maa; 1 ♂, Fak Fak, S coast of Bomberai, NW New Guinea, 100-700 m, 5. VI. 1959, Maa; 1 ♀, Waris, S of Hollandia, NW New Guinea, 450-500 m, 16-23. VIII. 1959, Maa; 1 ♀, Karimui, S of Goroka, NE New Guinea, 1000 m, 8. VI. 1961, J. L. & M. Gressitt; 1 ♀, Wau, NE New Guinea, 1100 m, 7. VI. 1968, J. W. Boyes.

DISCUSSION. The mesonotal and scutellar markings show much greater variation than is usual in 1 species. The holotype has sublateral dark mesonotal stripes joined to the median stripe, and the scutellum brown on almost the apical half; the ♂ from Genjam has the same mesonotal markings but the scutellum less extensively brown; the ♂ from Fak Fak lacks the sublateral mesonotal stripes and has the scutellum entirely yellow. However, the terminalia of the latter 2 specimens have been macerated in hydroxide and carefully compared, and they appear to be identical. The possible significance of the broadened front and greatly enlarged antennae of the ♂ is discussed below under *Myospila effeminata* n. sp.

Genus **Papuaiella** Vockeroth, new genus

Type-species: *Papuaiella ponti* n. sp.

Medium sized, shining, dark yellow or yellow-brown species. Length 5.6 to 7.4 mm.

Front of ♂ at narrowest point considerably narrower than anterior ocellus, parafrontal linear and frontal vitta obliterated. Anterior eye facets of ♂ slightly enlarged. Palpus slender, very slightly broadened towards apex.

Thorax with 2 + 3 strong dorsocentrals; prealar weak but distinct in ♂, strong in ♀; anterior intraalar moderately strong. Pteropleuron with moderately long black hairs dorsally on subalar ridge. Hypopleuron with hairs on beret and in front of spiracle but not on lower end of metepisternum. Posterior spiracle large in ♂, much smaller in ♀. Prosternum, metasternum and sternite 1 bare. Vein R with a few very short setae below just before, and just beyond, humeral crossvein. Vein R_{4+5} at extreme base with a few short setae above and a few longer setae below. Apex of vein M_{1+2} curved very slightly but distinctly forward. Posterior crossvein rather strongly sinuate.

♂ *Terminalia* (Fig. 67, 68). Very similar to those of *Gymnopapuaia*, differing only in having sternite 9 a little more shallow and aedeagal spine tapering only slightly to a rather broad and only slightly curved apex.

♀ *Terminalia* (Fig. 66). Ovipositor rather short, moderately well sclerotized, in dorsal view with tergite 6 projecting beyond tergite 5, ventrally about 2/5 as long as preabdomen. Tergite 6 weak, transverse, divided medially, with strong posterior setae. Tergite 7 short, narrowly divided anteriorly, more broadly divided posteriorly, each half subquadrate, with 4 moderately strong posterior setae. Tergite 8 short, very broadly divided, each half subtriangular, with 3 short posterior setae. Sternite 6 very small, with 2 long bristles and several shorter setae. Sternite 7 moderately long, narrow basally, slightly broadened apically, well sclerotized throughout, with a pair of moderately strong subapical bristles and several short apical setae. Each half of sternite 8 small, subtriangular, rather weak, with a moderately long and strong apical bristle and about 6

short stout setae. Membrane between sternites 7 and 8 slightly elongate, with dense slender scale-like spines which continue as smaller spines to apex of sternite 8. Epiproct large, broadly rounded posteriorly, abundantly haired; cerci moderately large; hypoproct large, only slightly convex below, with lateral and posterior margins curved only slightly upward.

Egg. Rather robust, about half as long as preabdomen, similar in structure to that of *Gymnopapuaia*, differing as follows: Flanges broader, extending only about 1/15 length of egg beyond body of egg, apical margin of anterior process irregular but not distinctly papillate. Surface between flanges with very distinct dark markings approximately of a diamond shape in irregular transverse rows; flanges with coarse irregular reticulation; rest of egg with fine but very distinct hexagonal pattern. Four eggs present in abdomen of 1 ♀, none with indication of developing larva.

DISTRIBUTION. New Guinea.

DISCUSSION. *Papuaiella* is undoubtedly closely related to *Gymnopapuaia*. The 2 genera are very similar in structure and are distinguished from all other regional Mydaeinae by the presence of a few fine setae on the under surface of vein R near the humeral crossvein. They may be distinguished from one another by means of the haired subalar ridge of *Papuaiella* (pteropleuron entirely bare in *Gymnopapuaia*) and by the greatly reduced halves of sternite 8 in the ♀ of *Papuaiella*.

Papuaiella ponti Vockeroth, new species Fig. 66-68.

♂. Length 5.6 to 7.4 mm. Front, parafrontal and cheek reddish; face greyish-white; occiput grey-black, partly white pollinose. Antenna with first 2 segments and base of third dark reddish, rest of third brown. Palpus dark brown. Thorax dark yellow, disc of mesonotum and scutellum slightly brownish. Pleural hairs mostly black, those of hypopleuron sometimes partly pale. Squamae, including margins and fringe, pale brown. Legs dark yellow, mid and hind tibiae sometimes slightly brownish, tarsi dark brown. Mid femur without distinct anteroventrals, with several weak and 1 moderately strong posteroventral on basal half. Hind femur with 1 weak but distinct anteroventral on basal half and several near apex, with 1 weak but distinct posteroventral at midlength. Abdomen dark yellow; tergite 3 brownish apically; most of tergite 4, and all of tergite 5, dark brown to black. Terminalia (Fig. 67, 68): Cercus covered with minute hairs except on distal part of apical processes, with long marginal hairs on upper 3/4 and a long hair at base of apical notch, otherwise with only a few scattered short hairs on lower half, with apical notch deep and narrowed apically, separating a slender inner process from a broader, slightly shorter, incurved outer process; surstylus rather broad, with apical half distinctly broadened.

♀. Length 6.1 to 7.1 mm. Very similar to ♂. Terminalia (Fig. 66) as described above.

DISTRIBUTION. New Guinea, 760-1850 m.

Types. Holotype ♂ (BISHOP 9601), Mt Hagen area, NE New Guinea, 1650 m, 28. VI. 1957, D. E. Hardy. Paratypes (BISHOP, BMNH, CNC, AMS): 3 ♀♀, Wamena, NW New Guinea, 1700 m, 10-25. II. 1960, T. C. Maa; 1 ♀, Kulima, NW New Guinea, 1400 m, 19-22. II. 1960, Maa; 2 ♀♀, Enarotali, Wisselmeren, NW New Guinea, 1850 m, 12. VII - 4. VIII. 1962; 1 ♀, Archbold Lake, Central Mts, NW New Guinea, 760 m, 26. XI - 3. XII. 1961, L. Quate; 3 ♂♂, 2 ♀♀, same data as holotype; 1 ♂, 2 ♀♀, Sinofi, 30 km S of Kainantu, NE New Guinea, 1590 m, 1-6. X. 1959, Maa; 1 ♂, Moke, NE New Guinea, ca 1600 m, 1. X. 1957, J. Smart; 1 ♂, Minj, W Highlands, NE New Guinea, 1700 m, 8-13. IX. 1959, Maa.

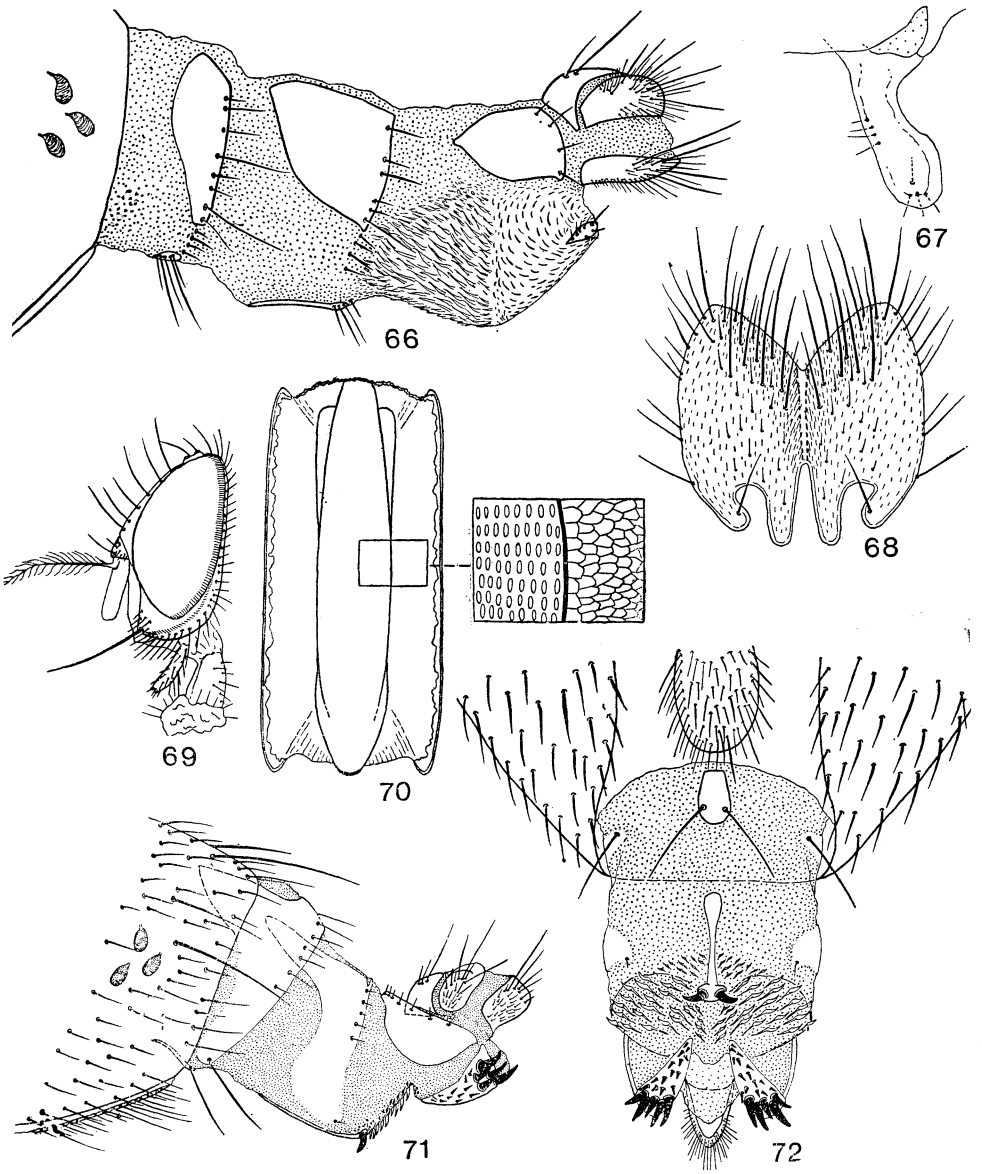

Fig. 66-72. 66-68, *Papuaiella ponti* n. sp.: 66, ♀ terminalia, lateral; 67, surstylus, anterolateral; 68, ♂ cerci, posterior. 69-72, *Chaetopapuaia setifrons* n. sp.: 69, ♂ head, lateral, holotype; 70, egg, dorsal, with enlargement of surface markings; 71, ♀ terminalia, lateral; 72, ♀ terminalia, ventral.

Genus **Chaetopapuaia** Vockeroth, new genus

Type-species: *Chaetopapuaia setifrons* n. sp.

Rather small, shining, dark yellow species. Length 6.1 mm.

Front of ♂ at narrowest point slightly wider than ocellar triangle and about 1/11 head width, frontal vitta almost obliterated. Each parafrontal sloping upward from eye margin to mid line, with 5 or 6 strong subequal bristles extending from anterior end of front almost to anterior ocellus, not differentiated into upper and lower orbitals, last frontal bristle as long as first and slightly longer than ocellar bristles (Fig. 69). Head of only available ♀ missing. Thorax with 2 + 3 strong dorsocentrals and 2 strong intraalars; prealar weak but distinct in both sexes; third (inner) postalar long, moderately strong. Presutural acrostichal hairs in about 10 irregular rows, lateral row very near dorsocentral bristles. Stigmatic area with moderately strong black bristle above stigmatic bristle. Pteropleuron bare. Hypopleuron with many long, rather strong black hairs on beret and in front of spiracle (apparently less numerous in ♀); metepisternum bare. Prosternum with a few rather strong dark hairs which, on posterior half, are restricted to lateral margins; metasternum bare; sternite 1 with a pair of dark hairs. Posterior spiracle in ♂ very slightly longer, in ♀ very slightly shorter, than upper margin of beret. Vein R_{4+5} with 3 or 4 short setae above and 4 or 5 below at extreme base; other veins bare. Apex of vein M_{1+2} curved very slightly forward (as in *Gymnopapuaia clavipalpis* n. sp., Fig. 20); posterior crossvein slightly sinuate.

♂ *Terminalia.* Not examined, but sternite 5 apparently as in *Papuaia.*

♀ *Terminalia* (Fig. 71, 72). Ovipositor short, well sclerotized, in dorsal view with apex of tergite 6 projecting beyond tergite 5, ventrally about 2/5 as long as preabdomen. Tergite 6 entire, with a row of posterior setae and with 2 broad bare triangular projections extending forward under tergite 5; tergite 7 similar in shape but completely divided except for a very narrow posterior bridge with a few minute posterior setae; tergite 8 entire, greatly narrowed medially and broadened laterally, with moderately long posterior setae. Sternite 6 small, subquadrate, with 1 pair of long and rather strong setae; sternite 7 very long and slender, narrowed on posterior half and slightly broadened again at apex, with a pair of short, very strong, recurved spinose setae near apex; each half of sternite 8 triangular, broadened apically, posterodorsal angle very narrowly joined to posteroventral angle of tergite 8, with 5 long strong curved spinose setae near apex, otherwise with very short strong setae. Membrane between sternites 7 and 8 elongate, with very strong sinuate scales each of which bears a blunt raised apex. Epiproct large, broadly rounded posteriorly, abundantly haired; cercus moderately large; hypoproct slightly compressed, very deep, with lateral and apical margins directed strongly upward.

Egg (Fig. 70). Slender, about 2/3 as long as preabdomen, on each side with broad dorsolateral flange which extends slightly beyond end of egg, anterior projection of flange continuous medially with a flattened anterior projection of both dorsal and ventral surface of egg, the broad anterior process so formed about 1/8 as long as body of egg, with coarsely papillate dorsal surface and anterior margin. Surface of egg between flanges flat, with very distinct hexagonal reticulation; flanges with finer, irregular and rather indistinct reticulation; rest of egg surface with minute and indistinct sculpturing. Four eggs present in abdomen of single ♀, none with indication of developing larva.

DISTRIBUTION. New Guinea.

DISCUSSION. The single species referred to this genus is superficially similar to the species of *Papuaia, Papuaiella* and *Gymnopapuaia*; it has very similar coloring, and, like the species of these 3 genera, has the hypopleuron haired on the beret and in front of the posterior spiracle. It differs markedly from all 3 genera in the structure of the ovipositor, from the first 2 in the width and bristling of the ♂ front, and from the last 2 in having the prosternum haired and vein R bare below. The species of *Chaetopapuaia* has the ♂ front similar in width to that of *Gymnopapuaia magnicornis* n. sp., but in the former the frontal vitta is obliterated and the strong orbital bristles are

of almost equal lengths and are not differentiated into upper and lower orbitals, whereas in the latter the frontal vitta is distinct throughout and the orbital bristles are of very unequal lengths and are clearly differentiated into an upper and a lower series.

Chaetopapuaia setifrons Vockeroth, new species Fig. 69-72.

♂. Length 6.1 mm. Head (Fig. 69) black, silvery pollinose. Antenna with first 2 segments dark yellow, third very pale yellow. Palpus with basal half brown, apical half yellow. Thorax bright yellow, disc of mesonotum very slightly darker. Pleural hairs black. Squamae entirely yellow. Legs yellow, mid and hind tibiae brown, tarsi dark brown. Mid femur without distinct anteroventrals, with 3 or 4 weak posteroventrals on basal half. Hind femur with anteroventrals only near apex, with 4 or 5 short weak posteroventrals on basal third. Hind tibia with 2 strong anterodorsals, 1 just before midlength and 1 at about 3/4 tibial length, and with 1 strong anteroventral just before distal anterodorsal. Abdomen yellow, tergites 3 to 5 obscurely brownish on disc. Tergite 4 with a weak discal on each side, with 8 strong marginals; tergite 5 with 3 strong discals on each side, with about 8 strong marginals.

♀. Head and mid legs missing. Very similar to ♂. Mesonotum slightly darker medially. Fore tibia without anterodorsal bristle. Hind femur apparently without posteroventrals. Terminalia (Fig. 71, 72) as described above.

Egg (Fig. 70). As described above.

DISTRIBUTION. New Guinea, 700-1200 m.

Types. Holotype ♂ (BISHOP 9602), Bomberi, Vogelkop, NW New Guinea, 700-900 m, 6. VI. 1959, J. L. Gressitt. Paratype ♀ (BISHOP): Wau, NE New Guinea, 1200 m, 8. I. 1962, J. Sedlacek.

DISCUSSION. The ♂ and ♀ referred here, although from widely separated parts of New Guinea, share so many distinctive characters that I have no doubt they are conspecific. The sparsely haired prosternum, the lack of short setae on the underside of vein R, and the presence of a row of presutural acrostichal hairs very near the dorsocentral bristles, of a distinct bristle above the stigmatic bristle, of long black hairs on the beret, and of 2 strong anterodorsals and 1 strong anteroventral on the hind tibia are characters found in few if any of the species of *Papuaia* or *Gymnopapuaia*. The occurrence of all these characters in both specimens makes it extremely likely that they are conspecific.

Genus **Helinomydaea** Vockeroth, new genus

Type-species: *Helinomydaea acrostichalis* n. sp.

Medium sized, rather slender, yellow or brownish, sometimes rather mottled species. Length about 5.1 to 6.1 mm.

Front of ♂ at narrowest point about as wide as ocellar triangle, at this point the frontal vitta distinct, making up half or more of width of front; first 3 or 4 pairs of lower orbitals short but decreasing only slightly in length caudad, upper orbitals represented only by minute hairs. Thorax with 2 + 3 strong dorsocentrals and 2 strong intraalars; prealar weak but distinct, slightly stronger in ♀. Presutural acrostichal hairs in 5 or 6 irregular rows; a pair or moderately strong bristles, at least half as long as first presutural dorsocentrals and slightly caudad of them, present among

presutural acrostichal hairs. Mesonotal hairs very sparse, notopleuron with at most 2 hairs, neither of which is near posterior notopleural bristle. Stigmatic area with a moderately strong black bristle above stigmatic bristle. Pteropleuron and hypopleuron, including metepisternum, bare. Prosternum, metasternum and sternite 1 bare. Posterior spiracle large in ♂, small in ♀, with a row of about 7 pale or dark hairs immediately behind fringe of posterior margin, these hairs about as long as fringe and none of them conspicuous. Vein R_{4+5} bare above, below with moderately strong setae from base halfway to anterior crossvein or slightly farther; other veins bare. Apex of vein M_{1+2} curved very slightly to quite distinctly forward. Posterior crossvein nearly straight. Crossveins with very narrow and faint brown clouds. Fore tibia without anterodorsal or posterior bristle in either sex. Hind tibia with 2 strong anterodorsals, with 3 or 4 weak anteroventrals, with a very short posterodorsal, shorter than tibial diameter, at about 3/4 tibial length, with dorsal apical absent or represented by an extremely short seta and with anterodorsal apical strong and slightly longer than tibial diameter.

♂ *Terminalia* (Fig. 77-79). Cerci broadly separated, joined only by membrane, each cercus rather narrow above, broad and bluntly rounded below, entirely covered with minute pile except very narrowly at apex, hairs scattered over most of cercus, rather sparse, much shorter and weaker than strongest hairs of tergite 9. Surstylus broad, strongly concave on inner surface, tapering on anterior margin to a bluntly rounded apex. Sternite 9 rather deep; pregonite extending only slightly beyond lowest part of sternite; postgonite rather thick, very broad basally, tapering to a moderately slender apex, with several distinct anterior setae. Aedeagus rather short and thick beyond constriction, with rather swollen membranous apex. Aedeagal spine broad basally, slightly narrowed towards apex, apex curved strongly ventrad.

♀ *Terminalia* (Fig. 73-75). Ovipositor very elongate, sclerites reduced to long, usually slender struts as in Muscini; in dorsal view about half or more of tergite 6 projecting beyond tergite 5, in ventral view ovipositor subequal in length to preabdomen. Tergite 6 divided into 2 long rather broad struts, which anteriorly have indistinct margins and are apparently joined by thickened membrane, each with the apex broadened, partly detached, divided into a very small outer and a large inner portion, and with abundant long and short setae. Tergite 7 divided into 2 very long slender struts, slighty more widely separated at middle than at either end, each with apex scarcely enlarged and with a few very short setae. Tergite 8 divided into 2 rather short broad struts, parallel-sided or broadened near midlength, apex of each with 2 or 3 minute setae. Sternite 6 long and slender, subequal in length to tergite, with apex slightly broadened and with a pair of strong setae. Sternite 7 extremely long and slender, longer than tergite, with a pair of short apical setae. Sternite 8 in the form of 2 long slender struts, each very slightly broadened from base to apex, apical portion with a few distinct punctures some of which bear minute setae. Membrane between segments 6 and 7 long, above and below with minute pale scarcely distinguishable scales, tergite and sternite 7 extending forward below membrane almost to segment 6. Membrane between segments 7 and 8 long, not more elongate below, entirely covered above and below with dense strong scales, each with a raised acute apex directed cephalad; tergite and sternite 8 extending slightly forward below membrane. Proctiger very small. Epiproct membranous medially at base, broadly rounded apically, with a pair of apical setae. Cercus at most twice as long as broad, horizontal in position beside epiproct, projecting at most very slightly beyond apex of hypoproct, ventrolateral surface sclerotized for a short distance before apex. Hypoproct subpentagonal, weakly sclerotized basally, with apical margin broadly rounded, with abundant setae, only very slightly convex and with margins not at all curved upward.

Egg (Fig. 76). Rather stout, body of egg about half as long as preabdomen. On each side with dorsolateral flange which is very low, thin, pale and inconspicuous on posterior half of egg, becoming darker and thicker from middle of egg forward, extending forward from end of egg as a very long filament, thick basally and tapering gradually or rapidly to an extremely slender apical portion, entire filament with smooth margins and from 0.8 to 1.0 × as long as body of egg. Antero-

dorsal apex of egg produced into a flattened, somewhat fleshy, rounded median process, about 1/10 to 1/14 as long as body of egg and with lateral margins lying below bases of anterolateral filaments. Anterior end of dorsal surface, between lateral flanges, with elongate low or rather strong swelling with coarsely papillate or reticulate surface, the swelling from 1/4 to 1/5 as long as body of egg. Dorsal surface of egg between flanges with faint pattern of elongate hexagons; flanges and filaments without discernible markings; anteromedian process apparently coarsely reticulate; rest of egg surface with extremely faint hexagonal reticulation. One ♀ of *H. acrostichalis* with 4 eggs, none with indication of developing embryo.

DISTRIBUTION. New Guinea.

DISCUSSION. This genus is sharply distinguished from all other regional genera here referred to the Mydaeinae by the pair of strong presutural acrostichal bristles, by the great reduction or complete absence of the dorsal apical bristle of the hind tibia, by the wide separation of the ♂ cerci, by the great elongation of the ovipositor and the reduction of its tergites and sternites to elongate struts, by the presence of spine-like scales both dorsally and ventrally on the membrane between segments 7 and 8, and by the form of the egg, with 2 extremely long apical filaments and only a short thick rounded apicomedian process between them.

The genus is placed in the Mydaeinae because of the presence of setae below the base of vein R_{4+5}, because of the very short ♀ cerci with only a trace of sclerotization on the lower (inner) surface, and because of the very long apical filaments of the egg. The latter character has not been shown to be characteristic of the Mydaeinae, but anterolateral filaments or at least short but distinct processes are present in at least some species of *Mydaea* (Thomson, 1937), *Myospila, Hebecnema* and *Gymnopapuaia,* although such processes are very short in *Chaetopapuaia* and *Papuaiella,* and absent altogether in *Papuaia* and *Graphomyia.* The eggs of *Phaonia* (Thomson, 1937) and of *Atherigona* (Bohart & Gressitt, 1951) are very similar in form to those of *Chaetopapuaia;* those of several Australian and New Guinea species of *Helina* s.l. have very weak flanges with no trace of apical processes, and those of *Dichaetomyia* are apparently variable, with strong flanges as in *Phaonia* or with very weak non-protruding flanges (cf. Hennig 1965, p. 46). These 4 genera *Phaonia, Atherigona, Helina* and *Dichaetomyia* are all referred to the Phaoniinae by Hennig (1965).

The picture, however, is complicated by several Australian species either referred by Malloch to *Helina* or apparently undescribed but very similar to these described species. I have examined the ♀ terminalia of *Helina flavofusca* Malloch, 1924, of *H. fuscoflava* Malloch, 1922, and of 3 other species. All have the ovipositor very similar to that of the 2 species of *Helinomydaea,* with the cerci greatly reduced, but the anterior ends of the halves of tergite 7 are usually broadened and the halves of sternite 8 are at most half as long as tergite 8. In 1 of the undescribed species, the halves of sternite 8 are reduced to minute sclerotizations at the posterior end of the segment, and the cerci, although very small, are slender and have about the apical third of the the lower (inner) surface sclerotized. In all 5 species the membrane between segments 7 and 8 is entirely strongly spinose; the egg in 4 (not present in the fifth) has slender, apicolateral filaments, from about 1/4 as long as, to much longer than, the body of the egg; but the apicomedian process is minute or absent. All 5

species have the wing veins entirely bare. *H. flavofusca* and an undescribed species have the dorsal apical bristle of the hind tibia greatly reduced or absent and have several presutural acrostichal hairs of the outer row slightly enlarged but not in the form of strong bristles; the other 3 species have the dorsal apical bristle of the hind tibia as strong as the anterodorsal apical and have the presutural acrostichal hairs fine and uniform. There can be little doubt that these 5 species are closely related to the species of *Helinomydaea*. Whether they should be considered congeneric with the latter, whether these 7 species should be referred to the Mydaeinae or the Phaoniinae, or even whether these 2 subfamilies can be maintained as defined by Hennig (1965) can only be determined by a thorough study of *Helina* s.l., and perhaps of other genera, from Australia and New Guinea and perhaps from a much wider area.

It should be noted that 2 other Australian species of *Helina, imitatrix* Malloch, 1924, and *trinubilifera* Malloch, 1922, have ♀ terminalia almost exactly as figured by Hennig (1955-64, p. 138, Textfig. 37) for the Palaearctic species *Helina quadrum* (Fabr.), 1805. They have eggs with a pair of very weak dorsolateral flanges which do not protrude at all beyond the apex, and with weak irregular longitudinal ridges on the rest of the surface of the egg.

Key to Species of Helinomydaea

1. Mesonotum and abdomen, in oblique posterior view, with at most very faint evenly distributed pollen ..... **acrostichalis** n. sp.

   Mesonotum and abdomen, in oblique posterior view, with a very distinct pattern of pale pollinose markings, mesonotum striped medially and with large irregular markings laterally, abdomen irregularly spotted ..... **punctiventris** n. sp.

Helinomydaea acrostichalis Vockeroth, new species Fig. 77-79.

♂. Length about 6.1 mm. Head black or somewhat reddish, face and parafacial slightly grey pollinose to silvery pollinose. Antenna with first 2 segments and base of third yellow-orange, rest of third dark brown. Palpus brown. Thorax dark yellow, uniformly subshining, without maculations; median mesonotal stripe between dorsocentral bristles, and disc of scutellum, slightly brownish. Disc of scutellum nearly bare, with only about 8 or 10 fine hairs apart from the usual marginal bristles. Squamae and their margins very slightly brownish. Legs yellow, tarsi dark brown. Mid femur with 1 or 2 very short weak anteroventrals near base, with a row of weak but moderately long posteroventrals on basal 2/3. Hind femur with an almost complete row of long anteroventrals which are strong only near apex, with a row of long but very weak posteroventrals on basal 2/3. Abdomen dark yellow, subshining, not mottled. Bristles of tergites 4 and 5 moderately strong. Terminalia (Fig. 77-79): Sternite 5 truncate posteriorly, with a pair of short curved posterolateral processes and with rather long posterior marginal bristles. Terminalia otherwise as described above under generic description.

♀. Length about 5.1 to 5.6 mm. Very similar to ♂. Palpus very slightly broader. Anteroventral and posteroventral bristles of mid and hind femora apparently less numerous, shorter and slightly stronger; posteroventrals of hind femur scarcely distinguishable. Terminalia: Less than apical half of tergite 6 projecting beyond tergite 5. Halves of tergite 8 parallel-sided. Membrane between segments 7 and 8 with rather fine and not very dark spines. Cercus about $1\text{-}^1/_3 \times$ as long as broad, ending well before apex of hypoproct.

Egg. Filament as long as body of egg, only slightly thickened at base, tapering rapidly so most of filament slender. Anteromedian process about 1/14 as long as body of egg. Anterodorsal swelling low, poorly defined, about 1/5 as long as body of egg, its surface coarsely papillate.

DISTRIBUTION. New Guinea, 1590-2720 m.

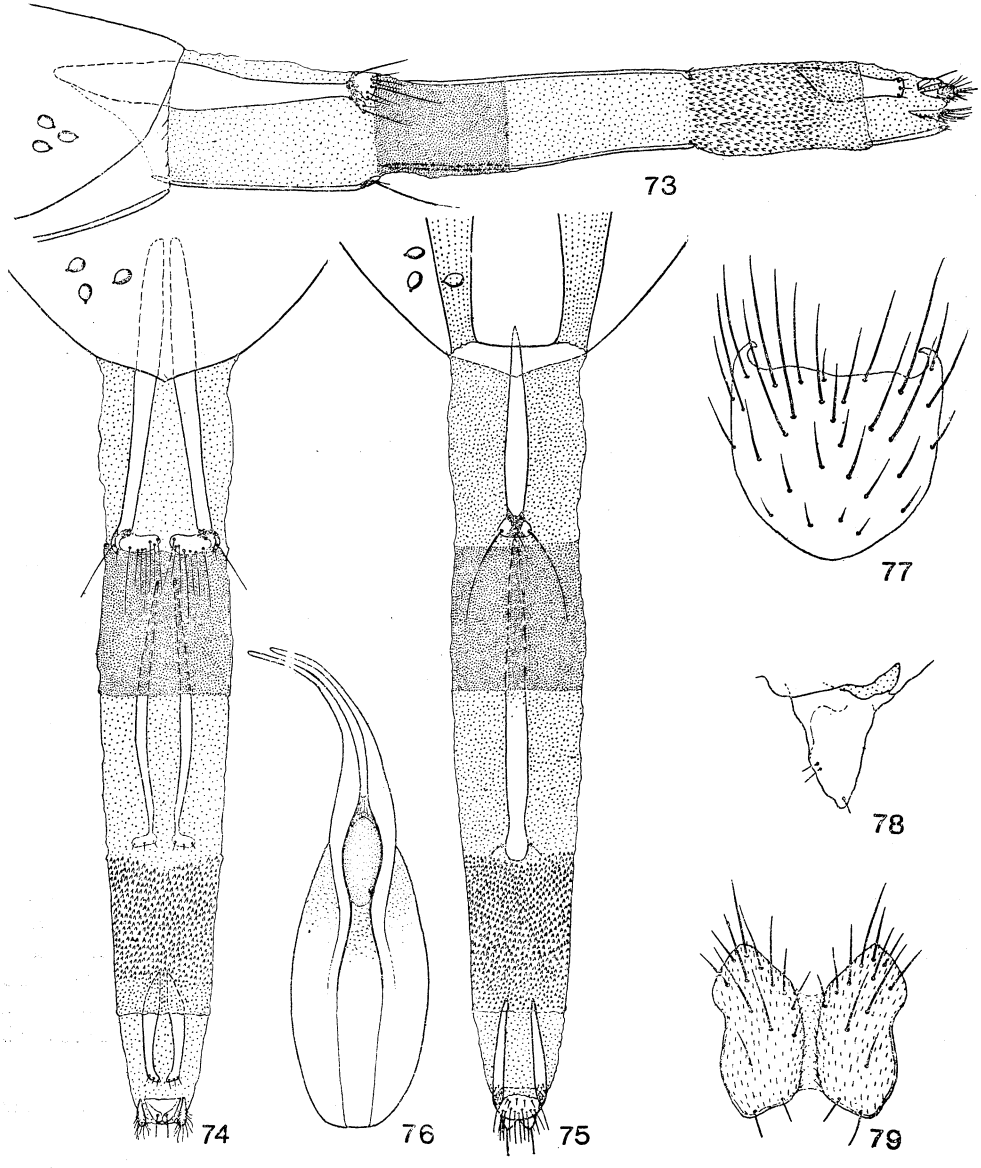

Fig. 73-79. 73-76, *Helinomydaea punctiventris* n. sp., ♀: 73, terminalia, lateral; 74, terminalia, dorsal; 75, terminalia, ventral; 76, egg, dorsal. 77-79, *H. acrostichalis* n. sp., ♂: 77, sternite 5, ventral; 78, surstylus, anterolateral; 79, cerci, posterior.

Types. Holotype ♂ (BISHOP 9603), Keglsugl, 2500-2720 m, nr Mt Wilhelm, NE New Guinea, 1. VII. 1963, light trap, J. Sedlacek. Paratypes (BISHOP, BMNH): 2 ♀♀, Wamena, NW New Guinea, 1700 m, 10-25. II. 1960, T. C. Maa; 1 ♀, 1 ♂, Sinofi, 1590 m, 30 km S of Kainantu, NE New Guinea, 4. X. 1959, Maa.

Helinomydaea punctiventris Vockeroth, new species Fig. 73-76.

♀. Length about 5.6 to 6.1 mm. Similar to that of *acrostichalis*, differing most noticeably in color pattern and in terminalia as follows: A triangular area around ocellar triangle distinctly white pollinose. First 2 antennal segments mostly dark brown, third narrowly reddish at base, otherwise black. Palpus black. Thorax brown, with very narrow blackish stripes along dorsocentrals and sometimes with obscure dark markings elsewhere on mesonotum, with blackish areas on pleura or with most of pleura blackish. Mesonotum with very irregular, broken, pale pollinose markings which are reversed when viewed from opposite direction, in extreme posterior view with a partly-divided broad median stripe, a narrow broken stripe along each row of dorsocentrals, a narrow band across suture and several big, irregular, partly confluent markings laterad of dorsocentrals. Scutellar pollinose markings indistinct, apparently consisting of a median spot, a basal submedian spot, and a larger sublateral spot. Pleura with irregular pollinose markings. Wing membrane distinctly brownish. Squama darker brown. Femora and tibiae yellow brown; bristles of fore and mid femora apparently similar but somewhat stronger. Abdomen with only base of tergite 2 yellowish, otherwise brown with reticulate pattern of irregular and partly fused spots of pale pollen. Terminalia (Fig. 73-75): About apical 4/5 of tergite 6 projecting beyond tergite 5. Halves of tergite 8 broadened near midlength. Membrane between segments 7 and 8 with strong and very dark spines. Cercus twice as long as broad, extending very slightly beyond apex of hypoproct.

♂. Unknown.

Egg (Fig. 76). Filament about 4/5 as long as body of egg, very thick basally, gradually tapering so only about apical half very slender. Anteromedian process about 1/10 as long as body of egg. Anterodorsal swelling strong, well defined, about 1/4 as long as body of egg, its surface coarsely and irregularly reticulate.

DISTRIBUTION. New Guinea, 0-1700 m.

Types. Holotype ♀ (BISHOP 9604), Nami Creek, nr Wau, NE New Guinea, 10. VI. 1962, J. L. Gressitt. Paratype (BISHOP): 1 ♀, Nabire, S Geelvink Bay, 0-30 m, NW New Guinea, Gressitt.

Genus **Hebecnema** Schnabl

Aricia (*Hebecnema*) Schnabl 1889, *Trudy Russk. Ent. Obshch.* **23:** 331.

Hebecnema, 1907, Bezzi & Stein, *Katal. Pal. Dipt.* **3:** 633; Séguy, 1937, *Genera Insect.* **205:** 277; Hennig, 1955-1964, *Fliegen Palaearkt. Reg.* **63b:** 136; 1965, *Stuttg. Beitr. Naturk.* **141:** 50.

Helina (*Hebecnema*), 1965, van Emden, *Fauna India, Diptera* **7**(1): 501.

Type-species: *Anthomyia umbratica* Meigen, 1826 (subsequent designation, Coquillett, 1901, p. 137).

Very small, black or somewhat reddish, slightly pollinose species. Length 3.7 to 4.5 mm.

Front of ♂ at narrowest point varying in width from much less than that of anterior ocellus, with frontal vitta completely obliterated, to about width of anterior ocellus or very slightly wider,

with frontal vitta distinct throughout; length of strongly narrowed portion of front rather variable. Each parafrontal with 2 moderately strong subequal lower orbitals and a few weak setulae or hairs among or just above them, near upper end with a pair of minute hairs apparently representing upper orbitals. Upper anterior eye facets of ♂ rather distinctly enlarged, upper part of head with a slightly flattened appearance in anterior view. Thorax with 2 + 4 moderately strong dorsocentrals; prealar at most very slightly longer and stronger than other mesonotal hairs; 3 intraalars, first 2 slightly shorter than third, usually subequal but second sometimes slightly shorter than first; third (inner) postalar present, about as strong as first intraalar. Presutural acrostichal hairs in 4 or rarely 5 regular or nearly regular rows, those of outer row of each side slightly but uniformly longer than those of inner rows. Notopleuron without short hairs. Pteropleuron, hypopleuron, prosternum, metasternum and sternite 1 bare. Posterior spiracle very small in both sexes. Vein R_{4+5} curved very slightly forward from a point about 3/4 of distance from posterior crossvein to wing apex, the curvature not increasing toward apex. Posterior crossvein nearly straight. Fore tibia without anterodorsal or posterior bristle in either sex. Mid femur with 1 anterodorsal preapical and 2 posterior preapicals. Hind tibia with 1 strong anterodorsal and 1 slightly weaker anteroventral.

♂ *Terminalia* (Fig. 83-91). Cerci narrowly to broadly fused, line of fusion nearly obsolete, each cercus moderately broad above, produced ventrad into a long, slender, bluntly rounded or subacute process which is broadly separated from that of other cercus, entirely covered with minute pile except on process beyond its base, dorsal portion with abundant hairs, longest of which are as long and strong as those of tergite 9. Surstylus moderately long, in lateral view sometimes slightly broadened near apex, anterior margin curved slightly inward and abruptly or gradually narrowed at 1/2 to 2/3 length of surstylus. Sternite 9 deep, triangular in lateral view; pregonite slender but protruding only slightly beyond lower posterior margin of sternite; postgonite stout, rather short. Aedeagus of nearly uniform width throughout, apex membranous, not enlarged, usually directed caudad; aedeagal spine broad throughout, strongly depressed or rather thick, apex usually curved at most slightly ventrad.

♀ *Terminalia* (Fig. 80, 82). Very short, moderately to strongly sclerotized, in dorsal view at least part of tergite 6 protruding beyond tergite 5, in ventral view ovipositor about 1/2 as long as preabdomen. Tergite 6 very large, strongly scelerotized,with abundant setae posteriorly and laterally, longer laterally, shortened and narrowly divided medially. Tergite 7 short or moderately long laterally, very long medially, extending forward to or slightly under tergite 6, with a deep narrow anteromedian notch which leaves only a narrow posterior margin entire; posterior margin of tergite with a few short setae. Tergite 8 very short medially, slightly or rather strongly lengthened laterally, each posterolateral angle with 1 or several moderately to very strong setae. Sternite 6 large, about 2/3 as long and half as wide as sternite 5, with several setae on posterior half. Sternite 7 absent. Sternite 8 broadly divided, each half either a minute sclerite bearing 1 or rarely 2 rather strong setae, or an elongate, posteriorly broadened and upcurved sclerite bearing at apex 4 extremely strong, blunt or acute, setae. Intersegmental membranes generally short, that between segments 7 and 8 either very slightly lengthened below and ventrally with a few rows of minute weak pale spicules, or moderately lengthened and ventrally and laterally with many rows of large, strong, pale or rather dark, recurved spicules. Proctiger, in dorsal view, either extending far beyond the apex of tergite and sternite 8, or almost enclosed by lateral portions of tergite 8 and not extending beyond apices of spinose setae of sternite 8. Epiproct an extremely short bare band lying cephalad of bases of cerci. Cerci dorsolateral in position, very close together, broad basally, slightly or rather strongly narrowed to a bluntly rounded apex, with many rather strong slightly curved setae mostly near dorsal margin and apex. Hypoproct large, broadly triangular, with abundant setae, weakly sclerotized anteromedially, apex and lateral margins curved strongly upward.

Egg (Fig. 81). Variable in size, from just over 1/2 to 2/3 length of preabdomen, moderately

slender, with a pair of sublateral dorsal flanges extending along entire length of egg, rather abraded anteriorly in most of the available eggs but in *nigrita* n. sp. apparently extended anteriorly as a slender, strongly tapering filament about 1/7 as long as body of egg, flange with smooth margin except near apex, apex of flange and free filament with strongly fimbriate margin. Anteromedian portion of egg apparently very slightly or not at all produced. Surface of flange with obscure elongate reticulation on posterior portion changing gradually to irregular longitudinal rows of minute dots anteriorly or with such rows of dots throughout. Surface of egg between flanges with reticulation of distinct and uniform or obscure and rather irregular elongate hexagons, on anterior 1/5 to 1/4 these hexagons becoming irregular or changing to separated hexagonal maculations. Rest of egg surface without discernible markings. Eggs varying in number from 1, with large second instar larva, to 12, with or without second instar larva.

DISTRIBUTION. New Guinea, Solomon Is., New Caledonia, northern Queensland; also Oriental, Ethiopian, Palaearctic and Nearctic regions.

DISCUSSION. Despite the 2 distinct forms of ovipositor found in the 4 regional species placed here, there seems to be no reason for not considering them congeneric. The differences between the 4 species are confined almost entirely to the width of the ♂ front, color, the ♂ cercal plate and the ovipositor and eggs; other external characters are extremely similar.

The genus has usually been separated from other Mydaeinae and from *Helina* by the somewhat flattened upper anterior part of the ♂ eyes. This character is extremely hard to appreciate. However, the 4 regional species, plus 7 Oriental, Palaearctic, Ethiopian and Nearctic species of which I have examined specimens, differ from all other Mydaeinae known to me in having 4 (or very rarely 5) almost regular rows of presutural acrostichal hairs with those of the outer row of each side slightly but distinctly longer and stronger than those of the inner rows, and in having 3 moderately strong intraalar bristles. Hennig (1965, p. 50) states that the ♀ cerci are broader than long, but this is not the case in the species treated here. However, the close approximation of the cerci in a dorsolateral position, their broad bases, and the presence of slightly curved setae on the cerci, as well as the large size of tergite 6 and the distinctive shape of tergite 7, with its 2 strong anterior submedian processes, seem to be characteristic of the genus.

The genus *Hebecnema* shows more variation in the setae on the node of R_s than do the other genera of the Mydaeinae. The 4 species treated here, as well as *H. nigrithorax* (Stein), 1900, from the Oriental region, all have the node of R_s setose both above and below. *H. heteromma* (van Emden), 1951, from the Ethiopian region, has the node setose only below. The Palaearctic and/or Nearctic species *affinis* Malloch, 1921, *fulva* (Bigot), 1885, *fumosa* (Meigen), 1826, *umbratica* (Meigen), 1826, and *vespertina* (Fallén), 1823 all have the node bare above and below. It seems unlikely that this character indicates natural groups within the genus as the ovipositor of *vespertina*, with the node bare, is extremely similar to that of *rufula* n. sp., with the node setose.

Some of the Palaearctic and Nearctic species differ rather markedly in other characters from the species treated here. *H. fumosa* and *H. umbratica* have the eye distinctly haired, especially in the ♂. The ovipositor of *H. nigricolor* (Fallén), 1825 (figured by Hennig 1955-64, Textfig. 38, p. 138) is very different from those of the regional spe-

cies, especially in the form of the proctiger.

There seems to be a correlation in the species of *Hebecnema* treated here between the form of the ovipositor and the number of ovariole eggs and the extent of their development within the ♀ abdomen. The single ♀ of each of *rufula* and *infuscata* in which immature stages were found in the macerated abdomen contained respectively a single large egg with a large second instar larva and a large second instar larva with no trace of an egg shell. Both species have the ovipositor very similar in structure (Fig. 82). It is rather slender with the halves of sternite 8 very small and weakly bristled and not extending to the apex of the proctiger, and with the membrane between segments 7 and 8 poorly developed and weakly spiculate. It is probable that in these species the ♀ deposits on the substrate chosen for oviposition either a mature second instar larva or an egg containing such a larva which can leave the egg and enter the substrate almost immediately. The ovipositor need not be used for penetration of the substrate to provide protection for the egg or larva.

The single ♀ of *nigrita* in which immature stages were found contained the remains of 12 eggs, one of which contained a small second instar larva. In this species, the ovipositor (Fig. 80) is broad, the halves of sternite 8 are moderately large, end in strong spinose bristles, and extend well beyond the proctiger, and the membrane between segments 7 and 8 is extensive and strongly spinose. In this case it seems probable that the ♀ uses the ovipositor to insert a moderate number of eggs or small larvae into the substrate where they would be protected from dessication. The ♀ of *gressitti* has an ovipositor very similar to that of *nigrita* and the method of oviposition will probably be found to be similar.

The differences in ovipositor structure and egg number and development found in the species of *Hebecnema* treated here are paralleled by the differences between the genera *Papuaia* and *Gymnopapuaia*.

Key to Regional Species of Hebecnema

1. Thorax and abdomen extensively reddish — at least humeral area or scutellum, and base and usually apex of abdomen, distinctly reddish 2

   Dorsum of thorax and of abdomen black in ground color although often with greyish-brown pollinose areas 3

2. Mesonotum mostly reddish but disc of mesonotum and scutellum dark brown; ♂, front narrower than width of anterior ocellus on about 3/4 of its length, frontal vitta obliterated on about 1/3 of its length (New Guinea) ..... **rufula** n. sp.

   Mesonotum mostly black, obscurely reddish laterally; scutellum reddish or yellowish, much paler than disc of mesonotum; ♂, front narrower than anterior ocellus on about 1/3 of its length, frontal vitta obliterated for only a very short distance (Solomon Is.) ..... **gressitti** n. sp.

3. Tergites 3 and 4 in ♂ (and probably in ♀) in posterior view each with a pair of large submedian blackish triangles; ♀, each half of sternite 8 elongate, with 4 very strong blunt spine-like setae at apex (Fig. 80) (New Guinea) ..... **nigrita** n. sp.

Tergites 3 and 4 in posterior view uniformly pollinose, without dark triangles; ♀, each half of sternite 8 minute, with 1 or 2 moderately strong setae (as in Fig. 82) (New Caledonia) ..... **infuscata** (Bigot)

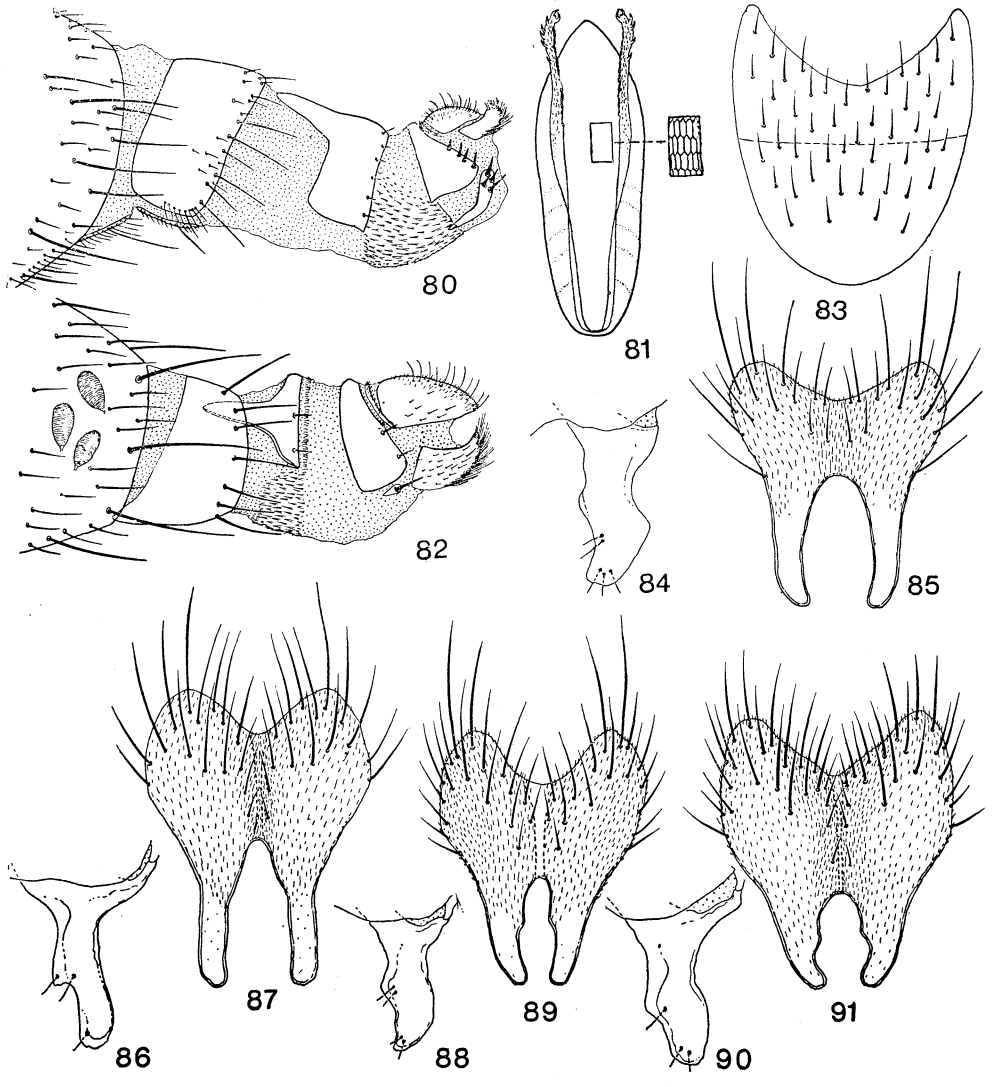

Fig. 80-91. 80, 81, *Hebecnema nigrita* n. sp., ♀: 80, terminalia, lateral; 81, egg, dorsal, with enlargement of surface markings. 82-85, *H. rufula* n. sp.: 82, ♀ terminalia, lateral; 83, ♂ sternite 5, ventral; 84, left surstylus, anterolateral; 85, ♂ cerci, posterior. 86, 87, *H. nigrita* n. sp., ♂: 86, left surstylus, anterolateral; 87, cerci, posterior. 88, 89, *H. infuscata* (Bigot), ♂: 88, left surstylus, anterolateral; 89, cerci, posterior. 90, 91, *H. gressitti* n. sp., ♂: 90, left surstylus, anterolateral; 91, cerci, posterior.

Hebecnema rufula Vockeroth, new species Fig. 82-85.

♂. Length 4.0 to 4.1 mm. Head grey-black, slightly pollinose. Front extremely narrow, narrower than anterior ocellus on about 3/4 of its length, frontal vitta obliterated on about 1/3 of its length. Antenna orange-brown, third segment slightly darker than first 2. Palpus blackish-brown. Thorax reddish or orange-brown, median mesonotal stripe, scutellum, and most of pleura dark brown. Wing very slightly yellow-brown. Squamae brownish, margin of lower one distinctly darker. Haltere with yellowish stem and brown knob. Legs reddish-brown to dark brown, tibiae rather yellowish. Mid femur without distinct anteroventrals, with 1 weak but distinct posteroventral near base. Hind femur with several strong anteroventrals near apex, with 3 weak but distinct posteroventrals on basal half. Abdomen dull yellow to reddish-yellow, tergites 4 and 5 obscurely darkened. Bristles of tergites 3, 4 and 5 moderately strong. Terminalia (Fig. 83-85): Cercus with process tapering evenly to a subacute apex. Surstylus in lateral view slightly broadened before apex, in anterior view gradually narrowed at about midlength. Aedeagal spine strongly depressed.

♀. Length 4.1 to 4.4 mm. Very similar to ♂, differing as follows: Legs slightly darker, tibiae not as distinctly yellowish. Abdomen with tergites 3 and 4 darkened above, 5 usually reddish, rarely dark. Terminalia (Fig. 82) slender. Tergite 7 short laterally. Tergite 8 only slightly longer laterally than medially, with weak posterior setae. Each half of sternite 8 minute, with 1 or 2 moderately strong setae. Membrane between segments 7 and 8 only slightly elongate below, ventrally with a few rows of weak spicules. Proctiger extending well beyond segment 8. Cercus broad on basal half, then slightly narrowed toward apex.

Egg. About 2/3 length of abdomen, anterior end of flanges and egg apparently slightly broken. Surface of egg between flanges with obscure and irregular hexagonal reticulation, on about anterior fourth with separated hexagonal maculations. One abdomen of 3 examined with very large second instar larva and one empty egg shell.

DISTRIBUTION. New Guinea, 0-1700 m.

Types. Holotype ♂ (BISHOP 9605), Minj area, NE New Guinea, 1700 m, 30. VI. 1957, D. E. Hardy. Paratypes (BISHOP, BMNH, CNC, AMS): NW NEW GUINEA: 1 ♂, 1 ♀, Kebar Val., W of Manokwari, Vogelkop, 550 m, 4-31. I. 1962, L. W. Quate; 1 ♂, Kutsime, W of Swart Val., 1500 m, 14. XI. 1958, J. L. Gressitt; 1 ♂, 3 ♀♀, Archbold Lake, Central Mts, 760 m, 26. XI. - 3. XII. 1961, Quate; 4 ♂♂, 4 ♀♀, Waris, S of Hollandia, 450-500 m, 24. VII - 31. VIII. 1959, T. C. Maa; 4 ♀♀, Ifar, 300-600 m, 21. VI. 1959, ex human excrement, Maa; 1 ♀, Guega, W of Swart Val., 1200 m, 15. XI. 1958, Gressitt; 1 ♀, Bokondini, 40 km N of Baliem Val., ca 1300 m, 16-23 XI. 1961, Quate. SW NEW GUINEA, 1 ♂, Fak Fak, S coast of Bomberi, Vogelkop, 10-100 m, 3. VI. 1959, Maa. NE NEW GUINEA: 1 ♀, Karimui, 1080 m, 14. VII. 1963, J. Sedlacek; 1 ♀, Wum, Upper Jimi Val., 840m, 18. VII. 1956, Gressitt; 1 ♀, same data as holotype; 2 ♂♂, 3 ♀♀, Minj, W Highlands, 8-13. IX. 1959, Maa. SE NEW GUINEA: 1 ♀, Daradae Plantation, 80 km N to Port Moresby, 500 m, 5. IX. 1959, Maa; 1 ♀, nr Port Moresby, 8. X. 1963, D. K. McAlpine.

Hebecnema infuscata (Bigot) Fig. 88, 89.

Spilogaster infuscata Bigot 1885, *Ann. Soc. Ent. Fr.* (**6**)**4:** 290.
Hebecnema infuscata, Stein, 1907, *Z. Syst. Hymenopt. Dipterol.* **7:** 277; 1919, *Arch. Naturgesch.* (1917) **83**A(1)**:** 115.

♂. Length 3.7 to 4.1 mm. Very similar to that of *nigrita*, differing as follows: Front at narrowest point slightly narrower than width of anterior ocellus, frontal vitta obliterated or nearly

so for a very short distance; tibiae yellow-brown to brown in color; tergites in posterior view uniformly grey-brown pollinose, without darker markings. Femoral bristles slightly shorter, none of posteroventrals of hind femur as long as femoral diameter. Terminalia (Fig. 88, 89): Cercus with process tapering only very slightly to bluntly rounded apex. Surstylus as in *gressitti* but slightly narrower. Aedeagal spine depressed.

♀. Length 3.7 to 4.1 mm. Very similar to ♂. Wing paler, yellowish-brown. Tibiae paler, dark yellow to yellow-brown. Terminalia apparently not differing in any constant characters from those of *rufula* (Fig. 82).

Egg. Not examined. The single ♀ in whose abdomen an immature stage was found contained a large second instar larva with no trace of an egg shell.

DISTRIBUTION. New Caledonia.

Type locality and types. New Caledonia, 2 ♂ syntypes in Hope Dept. of Entomology, Oxford (Pont, *in litt*.)

SPECIMENS EXAMINED (BISHOP, BMNH, CNC, AMS). 6 ♂♂, 13 ♀♀, Thio, 11. XI. 1958, C. R. Joyce; 7 ♀♀, Plaine des Lacs area, 5. XI. 1959, Joyce; 1 ♂, 13 ♀♀, Paita' 13. XI. 1958, Joyce; 1 ♂, 3 ♀♀, mountains above Ouaco, 20. X. 1958, Joyce; 1 ♀, in mountains up Beulari R., 3-4. XI. 1958, Joyce; 1 ♀, on heights between Thio and Nakety, 12. XI. 1958, Joyce; 1 ♂, 3 ♀♀, Canala, 11. XI. 1958, Joyce; 1 ♀, Hienghene, 25. XI. 1958, Joyce; 9 ♂♂, Nassirah, 10. XI. 1958, Joyce; 2 ♂♂, Dumbea R., 28. X. 1958, Joyce; 2 ♀♀, Col de Mouirance, 2. II. 1963, C. Yoshimoto & N. Krauss; 5 ♀♀, Col de Roussettes, 450-550 m, 4-6. II. 1963, Yoshimoto & Krauss; 1 ♀, Col de Pirogue, 23. I. 1962, Yoshimoto & Krauss; 1 ♀, Col de Ho, 11. II. 1963, Yoshimoto & Krauss; 7 ♂♂, 11 ♀♀, Sarramea, 12. II. 1963, Yoshimoto & Krauss; 1 ♀, Tao, 9. II. 1963, Yoshimoto & Krauss; 1 ♀, Yahoue, I. 1963, Krauss; 1 ♀, Col d'Amieu, 750 m, 3. III. 1960, J. L. Gressitt; 1 ♂, Foret de Thy, 550 m, 6. III. 1960, Gressitt; 4 ♀♀, Mt Koghi, 500-900 m, 1-3. X11. 1963, R. Straatman; 2 ♂♂, Noumea, 11. VII. 1925, W. H. Ford. Seven ♀♀ were taken in fly traps baited with human excrement and 4 on human excrement.

DISCUSSION. *H. infuscata* is not a synonym of *H. fumosa* Mg., based upon specimens of the latter introduced from Europe to New Caledonia, as was postulated by Stein- (1907, p. 277). *H. infuscata* has setae on both surfaces of the base of R_{4+5} and *H. fumosa* (and the other European species) have both surfaces bare. There is no reason at pre sent to consider *infuscata* as anything other than an endemic New Caledonian species.

Hebecnema nigrita Vockeroth, new species Fig. 80, 81, 86, 87.

♂. Length 4.4 mm. Very similar to that of *rufula*, differing as follows: Entirely dark brown to black in color, head rather strongly grey pollinose, thorax in posterior view greyish-brown pollinose; tibiae sometimes slightly brownish, wing slightly but distinctly brownish, squamae grey-brown, abdomen in posterior view grey-brown pollinose with a pair of large submedian blackish triangles on each of tergites 3 and 4. Front at narrowest point usually slightly wider than anterior ocellus; frontal vitta distinct throughout, rarely slightly narrower than ocellus; frontal vitta almost obliterated for a very short distance. Mid femur with a row of posteroventrals, several near base as long as femoral diameter, others shorter. Hind femur with a row of anteroventrals, only those near apex longer than femoral diameter; with a complete row of posteroventrals, only those near base

and near apex shorter than femoral diameter. Terminalia (Fig. 86, 87): Cercus with process narrowed only at base, of uniform width over most of its length, with broadly rounded apex. Surstylus in lateral view not broadened before apex, in anterior view abruptly narrowed at about 2/3 its length. Aedeagal spine thick.

♀. Length 4.3 to 4.5 mm. Very similar to ♂. Antennal segment 3 missing. Bristles of mid femur not visible; posteroventrals of hind femur shorter and less abundant than in ♂. Pattern of abdomen not determined before maceration. Terminalia (Fig. 80) rather broad. Tergite 7 rather long laterally. Tergite 8 considerably longer laterally than medially, posterolateral seta very strong. Each half of sternite 8 elongate, slender basally, broadened and curved upward apically, with 4 very strong blunt spine-like setae at apex. Membrane between segments 7 and 8 moderately elongate below, ventrally and laterally with many rows of strong spicules. Proctiger not extending beyond apices of spines of sternite 8. Cercus tapering gradually from base to apex.

Egg (Fig. 81). About 1/2 length of abdomen, anterior end apparently with a pair of short tapering anterolateral filaments about 1/7 length of body of egg and with fimbriate margins. Surface of flanges with obscure elongate reticulation on posterior portion changing to irregular longitudinal rows of minute dots anteriorly. Surface of egg between flanges with reticulation of distinct and uniform hexagons which become irregular and rather indistinct on about anterior fifth. Abdomen of single ♀ examined with 1 egg containing small second instar larva, with 3 empty but entire egg shells and dorsal surfaces only of 8 additional eggs.

DISTRIBUTION. New Guinea, 1150-1700 m.

Types. Holotype ♂ (BISHOP 9606), Baiyer R., W Highlands, NE New Guinea, 1150 m, 18. X. 1958, J. L. Gressitt. Paratypes (BISHOP, BMNH): NE NEW GUINEA: 1 ♂, same data as holotype but 19. X. 1958; 1 ♂, Sinofi, 30 km S of Kainantu, 1590 m, 4. X. 1959, T. C. Maa; 1 ♂, Aiyura, 1620 m, 19-24. X. 1959, Maa; 1 ♀, Minj Val., 1700 m, 23. VI. 1957, D. E. Hardy.

Hebecnema gressitti Vockeroth, new species Fig. 90, 91.

♂. Length 4.4 mm. Very similar to that of *rufula*, differing as follows: Front narrower than anterior ocellus on only about 1/3 its length, frontal vitta completely obliterated for only a very short distance. Antenna dark brown. Thorax mostly black, mesonotum only obscurely reddish laterally; postcallus and scutellum reddish to yellowish, much paler than disc of mesontum; pleura with restricted reddish areas. Wing and squamae very slightly darker. Mid femur without distinct anteroventrals or posteroventrals. Hind femora missing. Abdomen dark yellow basally, slightly darkened towards apex. Terminalia (Fig. 90, 91): Cercus with process rather short, abruptly narrowed on inner side at midlength, then of nearly uniform width to bluntly rounded apex. Surstylus in lateral view very narrow, not broadened before apex, in anterior view very broad, gradually narrowed at about 2/3 its length. Aedeagal spine depressed, apex membranous and almost recurved (perhaps deformed).

♀. Length 4.4 mm. Very similar to ♂, differing as follows: Antenna with apex of segment 2 and extreme base of 3 distinctly reddish. Thorax more extensively reddish, darker areas brownish rather than black. Hind femur as in *rufula* but without distinct posteroventrals on basal half. Terminalia: Very similar to those of *nigrita* (Fig. 80) but with setae of tergite 8 all weak, setae of sternite 8 very strong and acute apically, and cercus scarely narrowed towards apex. (The terminalia of only 1 ♀ were examined; these differences may not be constant).

DISTRIBUTION. Solomon Is.

Types. Holotype ♂ (BISHOP 9607), Kukundu, SW coast of Kolombangara I., New

Georgia Group, 1-12 m, 8-11. VII. 1959, ex human excrement, J. L. Gressitt. Paratypes (BISHOP): 2 ♀♀, Auki, Malaita, 2-20 m, 2. X. 1957, Gressitt.

Genus **Myospila** Rondani

Myospila Rondani, 1856, *Dipt. Ital. Prod.* **1:** 91; Malloch, 1925, *Aust. Zool.* **3:** 330; Snyder, 1940, *Am. Mus. Novit.* **1087:** 1; Hennig, 1955-64, *Fliegen Palaearkt. Reg.* **7**(2):113; 1965, *Stuttg. Beitr. Naturk.* **141:** 51; Snyder, 1965, *Insects Micronesia* **13** (6): 294. Type-species, *Musca meditabunda* Fabricius, 1781, by original designation.

Myiospila, Brauer & Bergenstamm, 1889, *Zweifl. Kaiserl. Mus.* **4:** 88 (erroneous subsequent spelling of *Myospila*); van der Wulp, 1896, *Biologia Cent.-Am.* **2:** 303 (emendation of *Myospila*); Séguy, 1937, *Genera Insect.* **205:** 352.

Mydaea (*Myiospila*), van Emden, 1951, *Ruwenzori Exped. 1934-35* **2** (6): 646; 1965, *Fauna India, Diptera* **7** (1): 472.

Phasiophana Brauer & Bergenstamm, 1891, *Zweifl. Kaiserl. Mus.* **5:** 86. Type-species, *Phasiophana obsoleta* Brauer & Bergenstamm, 1891, by monotypy.

Xenosia Malloch, 1921, *Ann. Mag. Nat. Hist.* (**9**)**7**: 421; 1922, *ibid.*, (**9**)**10:** 573; 1925, *Philipp. J. Sci.* **26:** 508; Karl, 1935, *Arb. Morph. Taxon. Ent. Berl.* **2:** 40; Séguy, 1937, *Genera Insect.* **205:** 377; van Emden, 1965, *Fauna India, Diptera*, **7**(1): 428; Hennig, 1965, *Stuttg. Beitr. Naturk.* **141:** 54. Type-species, *Mydaea ungulata* Stein, 1909 (= *Anthomyia bina* Wiedemann, 1830), by original designation.

Xenosina Malloch, 1925, *Philipp. J. Sci.* **26:** 509; 1935, *Ann. Mag. Nat. Hist.* (**10**)**16:** 226; Hennig, 1952, *Beitr. Ent.* **2:** 86; van Emden, 1965, *Fauna India, Diptera* **7**(1): 433. Type-species, *Mydaea morosa* Stein, 1918, by original designation.

Eumyiospila Malloch, 1926, *Philipp. J. Sci.* **31:** 499; 1928, *Ent. Mitt.* **17:** 314; Séguy, 1937, *Genera Insect.* **205:** 342; Pont, 1968, *Ent.Meddr* **36:** 174. Type-species, *Eumyiospila spinifemorata* Malloch, 1926 (= *Aricia argentata* Walker, 1857), by original designation.

Mydaea (*Eumyiospila*), van Emden, 1956, *Fauna India, Diptera* **7**(1): 488.

Helinella Malloch, 1926, *Philipp. J. Sci.* **31:** 498; Pont, 1969, *Stuttg. Beitr. Naturk.* **201:** 14. Type-species, *Spilogaster propinqua* Stein, 1901, by original designation. The genus might have been based on a misidentified type-species; see discussion under *propinqua* below.

Helina (*Helinella*), van Emden, 1951, *Ruwenzori Exped. 1934-35*, **2**(6): 627; 1965, *Fauna India, Diptera* **7**(1): 511.

Pahangia Malloch, 1928, *Ann. Mag. Nat. Hist.* (**10**)**2:** 311; Séguy, 1937 *Genera Insect.* **205:** 341. Type-species, *Pahangia flavipennis* Malloch, 1928, by original designation.

Eumydaea Karl, 1935, *Arb. Morph. Taxon. Ent. Berl.* **2:** 41. Type-species, *Aricia argentata* Walker, 1857, by original designation.

Sinomuscina Séguy 1937, *Genera Insect.* **205:** 358. Type-species, *Sinomuscina grisea* Séguy, 1937, by original designation.

Parapictia Pont, 1968, *Ent. Meddr* **36:** 179. Type-species, *Parapictia nudisterna* Pont, 1968, by original designation.

Rather small to large, robust, yellow to blackish species, rarely entirely shining or subshining, thorax usually pollinose and with indistinct or distinct spots or bands, abdomen usually pollinose and only rarely with distinct markings. Length 4.4 mm to 9.2 mm.

Front of ♂ (Fig. 98, 100) usually narrow, narrowest point at about 2/3 distance from antennae to anterior ocellus, at narrowest point varying from scarcely more than width of anterior ocellus with frontal vitta obliterated on up to 1/3 frontal length to about twice as wide as ocellar triangle with vitta distinct throughout and slightly broader than parafrontal; in *effeminata* n. sp. only, front broad throughout, narrowest opposite posterior ocelli where it is 2-1/2 × as broad as the ocellar triangle. Orbital bristles in ♂ usually decreasing gradually and more or less regularly in length from antennae to ocelli, rarely with first 4 pairs of almost uniform length, sometimes ending well before ocelli so as much as upper half of front may be bare except for a pair of weak to moderately strong proclinate or reclinate bristles situated beside or immediately below anterior ocellus; in *effeminata* n. sp. only, bristles as in ♀ (Fig. 101). Front of ♀ usually with 2 reclinate upper orbitals, with only 1 in *effeminata* n. sp. Lunule ivory yellow in color. Antennal segment 3 in anterior view usually 2-1/2 × as long as second and ending well above level of strongest vibrissa; in *effeminata* n. sp., segment 3 about 6 × as long as 2 in ♂, 3-1/2 × in ♀, in ♂ extending to level of strongest vibrissa. Palpus slender or slightly broadened in ♂, usually distinctly and sometimes rather strongly broadened in ♀. Thorax with 2 strong, or 1 strong and 1 weak, humeral bristles; 2 + 3 or 2 + 4 dorsocentrals, in the latter case, the first 2 postsuturals may be short and rather weak; prealar usually weak or absent, at most half as long as posterior notopleural, at least as far from transverse suture as from anterior supraalar; posterior intraalar strong, anterior intraalar strong, weak or absent; 2 postalars, inner one much longer than outer. Presutural acrostichal hairs uniform in length, in about 8 to 10 irregular rows. Postalar declivity usually bare; in *laevis* (Stein) only, with a few short stiff black hairs at midlength near ventral margin. Suprasquamal ridge usually bare; in *laevis* only, with a few short stiff black hairs near anterior end. Scutellum usually bare laterally below level of strong marginal bristles, in ♀♀ of *laevis* and *setinervis* (Stein) with an irregular row of strong hairs about halfway between marginal bristles and lower scutellar margin, in ♀ of *setosissima* with fine hairs at lower margin and at sides of under surface. Mesopleuron with distinct anterodorsal bristle; its anterior declivity usually bare, with hairs on upper third only in *cincta* (Bigot). Pteropleuron usually bare, with a few short black hairs on anterior portion of subalar ridge only in *cincta*. Sternopleural bristles usually 1:2, rarely 2:2 with the lower anterior weak. Hypopleuron usually entirely bare, beret with a few short stiff black hairs only in *laevis* and in some specimens of *cincta*. Posterior spiracle varying in length from 1-1/2 to 1/2 × length of beret, usually larger in ♂ than in ♀, with a few long fine black setae in fringe of anteroventral margin only in *laevis*. Prosternum and metasternum haired or bare; sternite 1 usually bare, with a few hairs only in ♀ of *laevis*. Wing usually clear or slightly yellowish, with apical half distinctly darkened only in *fumidala* n. sp. Vein R_1 usually bare, rarely with setae on part or all of dorsal surface, more rarely also with a few setae on ventral surface. Node of Rs and base of vein R_{4+5} usually setose above and below, setae usually extending to or beyond anterior crossvein; 1 or several ventral setae at base sometimes elongate, in *propinqua* (Stein) setae present only on ventral surface; in ♀ of *setinervis* only vein Rs with 1 or 2 weak setae below before fork of Rs. Vein M_{1+2} usually bare, with a few fine dorsal setae on first section and fine ventral setae on about basal half only in *squalens* (Walker). Vein M_{3+4} usually bare, with a few strong dorsal and ventral setae at base only in *setosissima* n. sp. Apex of vein M_{1+2} curved very slightly to moderately forward (Fig. 93-95); posterior crossvein usually distinctly curved, rarely nearly straight or rather strongly sinuate. Mid femur at midlength with a strong anterior bristle preceded by a row of shorter bristles, usually with 1 strong anterodorsal preapical, with 3 or 4 strong dorsal to posterior preapicals, and with anteroventrals and posteroventrals which vary greatly in length, strength and number. Hind femur with a complete row of anterodorsals, with 1 strong dorsal and 1 strong posterodorsal near apex, with weak posteroventrals on basal half, and with a row of strong anteroventrals usually confined to apical half but sometimes more extensive, in ♂ of *argentata* (Walker) only hind femur, and often also mid femur, usually with anteroventrals of apical half represented by a comb-like series of short stiff slightly curved black spines (Fig. 96, 97). Fore tibia with bristles only at apex. Mid tibia with 2 or 3 posterior bristles. Hind tibia with 1 to 3 anterodorsals and 1 or 2 anteroventrals. Tergite 2 laterally

with strong marginals; tergite 3 laterally with rather weak discals, with a complete series of strong marginals; tergite 4 with strong discals except medially and with strong marginals.

♂ *Terminalia* (Fig. 102-117). Cerci narrowly to rather broadly fused, line of fusion distinct. Cerci covered with minute pile except ventrolaterally or apically, with moderately long hairs which are sparse on ventral half and are much shorter and weaker than hairs on tergite 9. Apex of cercus either very broad and subtruncate, with broad shallow rounded emargination, or tapering to bluntly rounded point. Surstylus slender, in anterolateral view parallel-sided or slightly broadened toward apex. Sternite 9 shallow to moderately deep. Pregonite rounded apically. Postgonite rather swollen, thickest at or a little beyond midlength and then abruptly or gradually narrowed to bluntly rounded apex, at or beyond midlength curved strongly or slightly ventrad. Aedeagal spine broad, flat, truncate apically, nearly parallel-sided, broadened beyond base and broadest at midlength or at apex.

♀ *Terminalia* (Fig. 118-126). Moderately long, from 1/2 to 2/3 length of preabdomen. Usually slightly compressed towards apex, rather strongly compressed only in *effiminata* n. sp. and nearly cylindrical and not at all compressed only in *pallidibasis* n. sp. and *novaebrittaniae* n. sp. Tergite 6 weakly sclerotized, short, broad, divided medially, narrower anteriorly than posteriorly, with a posterior row of long fine setae, sometimes with a very weak irregular detached sclerite lying in membrane caudad of its posterolateral angle but otherwise differing little in different species. Sternite 6 about as long as broad, with a pair of long submarginal setae at 2/3 its length. Tergite 7 well sclerotized, saddle-shaped, subquadrate or slighly elongate, narrowed anteriorly and almost always with a shallow anteromedian emargination forming 2 anterior submedian lobes, usually broadened posteriorly (in *effeminata* only, broadest near anterior end), the posterolateral angle usually produced ventrad as a slender lobe, produced caudad only in *effeminata*. Sternite 7 usually elongate, either very slender or suboval, from 3 to 8 × as long as maximum width, and sometimes with apical setose portion almost or completely separated from the long basal portion, in *pallidibasis* and *novaebrittaniae* about twice as long as broad and weakly sclerotized laterally, in *flavipennis* (and in the extralimital species *nudisterna* (Pont), 1968) reduced to a minute remnant at posterior margin of segment; apical portion of sternite always with 2 weak to moderately strong setae, sometimes with 2 to 4 additional very small setae. Tergite 8 divided into 2 triangular to subquadrate anterolateral portions and a short broad strap-like posterior portion which is rarely narrowly divided medially and bears a single row of setae along part or all of its posterior margin; anterolateral portions narrowly to broadly separated dorsally, usually very narrowly joined sublaterally to posterior portion, in *effeminata* narrowly joined both sublaterally and submedially. Halves of sternite 8 usually elongate, slender basally and slightly broadened to apex, with 4 to 16 setae on apical half or less and with 1 or more of these setae strong and spiniform; in *pallidibasis* and *novaebrittaniae* each half of this sternite reduced to a minute posterior remnant with 2 or 3 weak setae. Epiproct triangular, variable in shape, rarely with anterior angles produced laterad as slender processes, with 2 long and sometimes also several short apical setae. Cercus usually slender basally, broadened to the subtruncate or bluntly rounded apex, and from $1\text{-}^1/_2$ to $2\text{-}^1/_2$ × as long as maximum width; in *effeminata* only subcircular. Hypoproct shallow (with lateral margins curved scarcely dorsad) to deep (with these margins curved strongly dorsad), curved slightly to strongly upward posteriorly, in *laevis* only also curved upward anteriorly and with dorsolateral margins produced triangularly dorsad. Membrane between segments 7 and 8 expanded below, usually densely covered on lower 1/2 to 2/3 with distinct flattened scale-like spines, in *cincta* with finer spines extending almost to mid dorsal line, in *flavipennis* without distinguishable spines.

Egg (Fig. 127-135). Moderately long and slender, from 1/2 to 3/5 as long as preabdomen. Entire length of egg with a pair of infolded dorsolateral flanges which are truncate posteriorly and are usually produced anteriorly into a tapering triangular filament from 1/18 to 1/4 as long as body of egg, but in *novaebrittaniae* (and probably in the unknown egg of *pallidibasis*) are also truncate

anteriorly with no free projecting filament. Dorsal surface of egg produced into a short bluntly rounded anterior process which is usually much shorter than anterior filaments. Margins of filaments and of median processes usually with short truncate papillae, rarely with longer and more irregular papillae. Reticulation of anterior processes, anterodorsal flanges, anterior process and of dorsal surface between flanges rather variable, of rest of egg surface rather uniformly hexagonal. Micropyle on under surface of anterior part of egg, at posterior end of a slightly concave or flattened area, at from 1/20 to 1/7 length of body of egg (at 1/4 length in an egg of *cincta* (Bigot) from Malaya). Eggs varying from 1 to 16 in number (58 in 1 female of *lenticeps* (Thomson) from Ceylon), without trace of developing larva.

Discussion. I have examined specimens of both sexes (including the terminalia) of the type-species of *Myospila, Xenosia, Eumyiospila* (= *Eumydaea*), *Helinella,* and *Pahangia,* and of the ♀ only of *Phasiophana.* In all these species the ♀ terminalia are very similar, with tergite 7 divided medially on at most the anterior 1/4, and with tergite 8 nearly or entirely divided into 2 anterolateral sclerites and 1 posterior sclerite (the terminalia of *Myospila meditabunda* were figured by Hennig (1955-64, Fig. 32), those of *Xenosia ungulata* (Stein) by Hennig (1965, Fig. 37), and those of *Helinella lenticeps* (Thomson) by Pont (1969b)). I have examined also the holotype ♂ and allotype ♀ of the type-species of *Parapictia*; the terminalia of both sexes were figured by Pont (1968a), and those of the ♀ are of the type described above. I have also examined specimens of the type-species of *Xenosina* but have not examined the terminalia. In all these species the last section of vein M_{1+2} is curved at least very slightly forward at apex. Pont (*in litt.*) has informed me that he has examined the holotype ♂ of *Sinomuscina grisea* Séguy and that it should be referred to *Myospila* as defined here.

I have examined also the ♀ terminalia of most of the regional species treated below, of several other Oriental species, and of *M. maculiventris* Malloch, 1921, from the Ethiopian region. Although the terminalia show moderate differences from one another (cf. key below based on terminalia), all have tergites 7 and 8 as described above, and all the species have vein M_{1+2} with at least slight forward curvature at apex.

The many genera here treated as synonyms of *Myospila* were based on characters such as the presence or absence of prosternal hairs, the shape of the lower squama, the number of anterodorsal bristles on the hind tibia, and the distribution of setae on the veins. Additional genera could as well be proposed for *M. cincta* (Bigot), which has a few pteropleural hairs; for *M. setosissima* n. sp., which has setae on both surfaces of vein M_{3+4}; for *M. squalens* (Walker), which usually has setae on the underside of vein M_{1+2}; and for *M. effeminata* n. sp., which has a broad ♂ front and elongate antennae. Such a proliferation of genera seems to me unnecessary and undesirable.

The genus apparently most closely related to *Myospila* is *Mydaea,* which, unlike *Myospila,* is predominantly Holarctic in distribution. It is briefly characterized in the introduction, and the differences between the ovipositors of the 2 genera are discussed. Whereas the genera of Mydaeinae seem to be difficult to separate on the basis of characters of the ♂ terminalia, in the case of these 2 genera distinctive characters seem to be present in each group. I have examined the ♂ terminalia of *Mydaea scutellaris* R.-D., the type-species, and of *M. urbana* (Meigen), 1826, *M. flavicornis* Coq., 1902, *M. occidentalis* Mall., 1920, *M. discimana* Mall., 1920, *M. neglecta* Mall., 1920, and

M. brevipilosa Mall., 1920. I have examined the ♂ terminalia of most of the regional species of *Myospila* treated below, and also of the type-species of *Myospila* and of those nominal genera here treated as synonyms of *Myospila* as noted above. In *Mydaea* sternite 5 has (except in *scutellaris*) from 2 to 7 long strong bristles near the inner margin of each posterior lobe; the cercus is at least moderately narrowed below to a bluntly rounded apex; the surstylus is broad to very broad basally and is usually slightly to strongly narrowed apically; the pregonite is short, with the portion projecting beyond sternite 9 at most $1\text{-}^1/_2\times$ as long as broad; the aedeagal spine is either broad throughout or broad basally and gradually narrowed to a bluntly rounded apex. In *Myospila* sternite 5 has at most 1 or 2 pairs of very weak bristles only a little stronger than normal hairs; the cercus is usually broadly truncate apically and only rarely slightly narrowed to form a very short blunt point; the surstylus is narrow basally and either of uniform width throughout or slightly broadened near the apex; the pregonite is long, with the portion projecting beyond the sternite at least twice as long as broad; the aedeagal spine, although rather broad basally, is considerably broadened on the apical half.

Most, and perhaps all, of the species referred by Pont (1966a, 1966b, 1968a, 1969a) to *Lasiopelta* in his papers on Oriental and New Guinea Muscidae should be assigned to *Myospila*. The differences between these 2 genera are discussed in the introductory part of this paper. The genus *Lasiopelta* as defined here is not known to occur east of Taiwan and Malaya.

The genus *Myospila* is widespread, with the largest number of species in the Oriental region to the west of New Guinea. The other genus of Mydaeinae with an extensive development in New Guinea, *Gymnopapuaia,* is restricted entirely to New Guinea and adjacent areas and is not known to occur west of New Guinea and Tanimbar Is. There is an equally marked difference in the distribution of the regional species of the 2 genera. Over half of the known species of *Gymnopapuaia* occur only in New Guinea; 9 of the species treated here have not been recorded from below 1000 m, and 5 of these not below 1750 m. Unplaced ♀ specimens in the Bishop Museum indicate that additional species occur in New Guinea, particularly at high altitudes. In contrast, of the 9 species of *Myospila* here recorded from New Guinea, all occur at or near sea level, only 1 is recorded from an altitude above 2000 m, 6 are represented on the mainland of Asia (or in Ceylon) by populations which are either considered conspecific with the New Guinea forms or may be so considered in the future, 1 (*squalens* (Walker)) occurs also on adjacent islands, 1 (*pallidibasis* n. sp.) may be conspecific with a similar form in New Britain, and only 1 (*papuensis* n. sp.) is known only from New Guinea with no obvious close relative elsewhere. The other 5 regional species are distributed as follows: 1 in the Bismarck Arch. and Solomon Is., 1 (probably the most distinctive in the entire genus) only from Fiji, and 3 (perhaps better considered as geographic forms of 1 species) from the Bismarck Arch., Solomon Is., and New Hebrides respectively.

The ♀♀ of *Myospila,* like those of *Gymnopapuaia,* often contain a moderate (or rarely large) number of ovariole eggs without traces of a developing larva, and are probably all oviparous. It is perhaps significant that, as far as is known, the species of *Myospila* with compressed terminalia all have sternite 8 well developed and

with short strong setae, and all have the lateral flanges of the egg distinctly produced into a pair of short to moderately long anterior filaments, and that the 2 species whose eggs have the longest filaments, *laevis* and *setinervis*, have the largest number of setae on the halves of sternite 8, with several of the setae distinctly longer and stronger than the others. In *novaebrittaniae* and in *pallidibasis* the terminalia are essentially cylindrical and the halves of sternite 8 are greatly reduced and bear only a few weak setae, so that the terminalia are probably much less effective in penetrating a substrate during oviposition than are those of the other species. At the same time, *novaebrittaniae* is the only species in which the flanges of the egg are not produced anteriorly into a short filament (the same is probably true of the unknown egg of *pallidibasis*). It is probable that *novaebrittaniae* oviposits into a rather soft and very moist substrate where there is little danger of the egg drying before emergence of the larva, and that at least the anterior end of the egg is left exposed. On the other hand it seems probable that at least *laevis* and *setinervis* lay their eggs in a firmer and dryer substrate or at least in one where the risk of drying of the surface is greater, that the egg is inserted well below the surface, and that the elongate anterior filaments are exposed for respiratory purposes at or above the surface of the substrate.

Key to Regional Species of Myospila

1. Prosternum haired; hind tibia with 1 to 3 anterodorsal bristles.....2
   Prosternum bare; hind tibia with 1 anterodorsal.....6

2(1). Beret with a few short stiff black hairs; anterior intraalar bristle strong; posterior spiracle very large, at least as long as beret, with several long fine black setae on anteroventral margin; antenna dark brown to black; hind tibia with 2 anterodorsals; ♂, frontal vitta distinct throughout, orbitals present on entire length of front (Fig. 100); ♀, vein R_1 with strong setae above on at least basal half, scutellum laterally with a row of hairs below level of marginal bristles (New Guinea, Borneo, SE Asia).....
   .....**laevis** (Stein)

   Beret bare; anterior intraalar absent; posterior spiracle usually small, much shorter than beret, if large without setae on margin; other characters listed above variable.....3

3(2). Hind tibia with 2 or 3 anterodorsals; vein R_1 with strong setae above over most of its length 4

   Hind tibia with 1 anterodorsal; vein R_1 bare above 5

4(3). (♀ only; ♂ unknown). Vein M_{3+4} with several strong setae above and below at base; 1 seta below base of R_{4+5} fully twice as long as anterior crossvein; scutellum laterally with a row of short stiff hairs below level of marginal bristles and also with a few finer hairs near lateral margin of ventral surface; mid and hind femora bright yellow; palpus brown on about basal 1/3, otherwise bright yellow (New Guinea).....
   .....**setosissima** n. sp.

   Vein M_{3+4} bare; longest seta below base of R_{4+5} not more than $1\text{-}1/3$ × as long as anterior crossvein; all femora mostly dark brown to black; palpus dark brown, at most slightly paler towards apex; ♀, scutellum with a row of lateral hairs below level of marginal bristles but without ventral hairs; ♂, without lateral hairs below level of marginal bristles (Bismarck Arch., Solomon Is.).....**setinervis** (Stein)

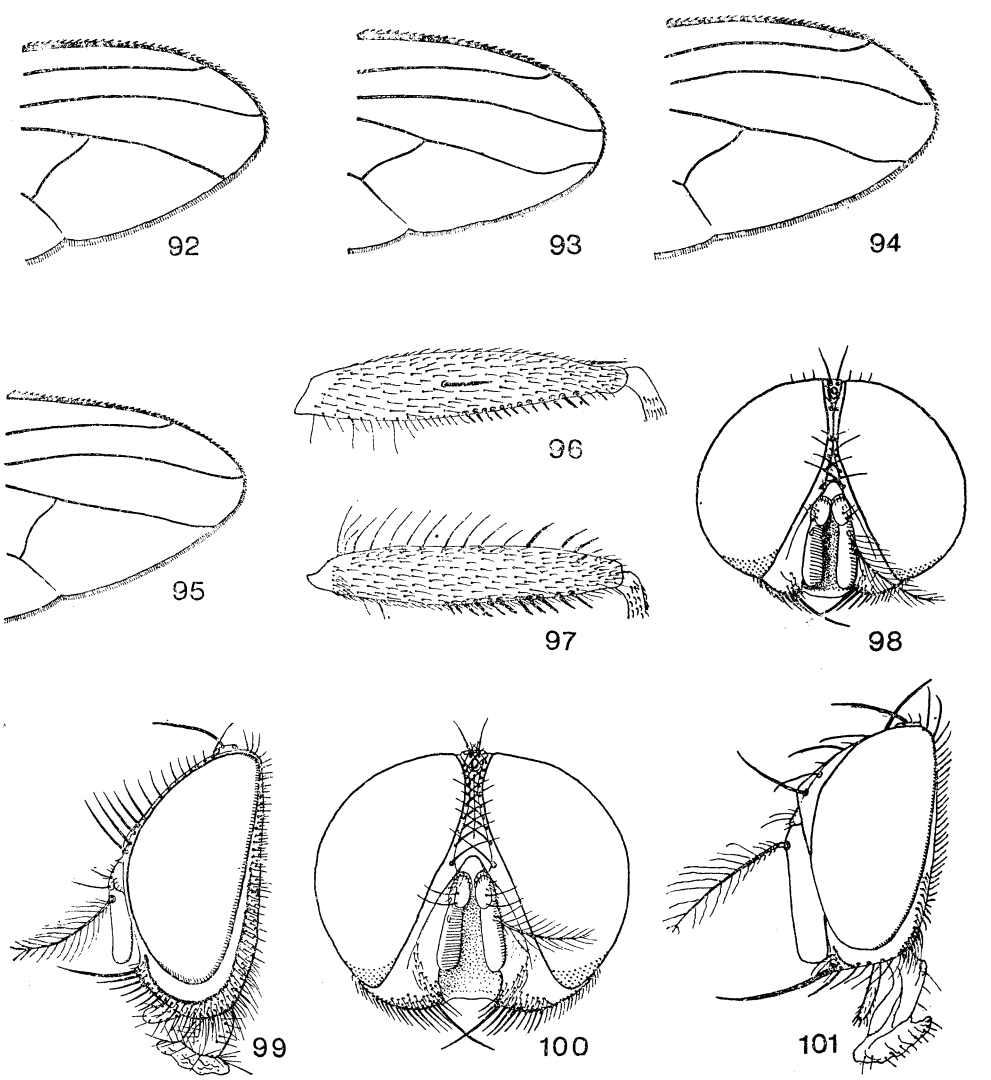

Fig. 92-101. 92, *Mydaea scutellaris* Robineau-Desvoidy, wing apex; 93, *Myospila meditabunda* (Fabricius), wing apex; 94, *M. laevis* (Stein), wing apex; 95, *M. squalens* (Walker), wing apex. 96, 97, *M. argentata* (Walker): 96, ♂ mid femur, anterior; 97, ♂ hind femur, anterior. 98. *M. aureorufa* n. sp., ♂ head, anterior, holotype. 99, 100, *M. laevis:* 99, ♂ head, lateral; 100, ♂ head, anterior. 101, *M. effeminata* n. sp., ♂ head, lateral, holotype.

5(3). Antenna black; 2 + 4 dorsocentral bristles, first postsutural only slightly shorter than second; vein M_{1+2} bare below; mesonotum in posterodorsal view with broad median stripe of grey or brown pollen, otherwise dark; scutellum mostly shining black; abdomen entirely black, subshining (SE Asia, New Guinea, Bismarck Arch., Solomon Is.)··· ·····**flavipennis** (Malloch)

Antenna yellow; 2 + 3 or 2 + 4 dorsocentrals, if the latter then first postsutural at most 1/3 as long as second; vein M_{1+2} with few to many short weak setae below on first section in ♀, bare or with a few setae in ♂; mesonotum in posterodorsal view pale grey pollinose with broad black median stripe and broad black postsutural margins; disc of scutellum pale grey pollinose, margins shining black; abdomen of ♂ extensively yellow, of ♀ yellow to reddish on base of tergite 2 and apex of tergite 5 (Kai Is., Amboina, New Guinea, Bismarck Arch.)·····**squalens** (Walker)

6(1). Pteropleuron with a few strong black hairs on anterior part of subalar ridge; anterior declivity of mesopleuron with many fine black hairs on upper half extending forward almost to spiracle; mesonotum grey pollinose with a broad shining black transverse band covering anterior half of postsutural portion (Ternate, New Guinea, Bismarck Arch.)·····**cincta** (Bigot)

Pteropleuron bare; anterior declivity of mesonotum bare or with at most a few hairs extending not more than halfway from anterodorsal mesopleural bristle to spiracle; mesonotum not banded·····7

7(6). Femora black on at least basal 1/3·····8

Femora entirely yellow·····11

8(7). Base of vein R_{4+5} bare above; 2 + 3 dorsocentral bristles; antennal segment 3 mostly black; tarsi yellow (Amboina, New Guinea, Solomon Is.)·····**propinqua** (Stein)

Base of vein R_{4+5} setose above; 2 + 4 dorsocentrals·····9

9(8). Antenna yellow; tarsi yellow; trochanters yellow or yellowish·····10

Antennal segment 3 mostly black; tarsi black; trochanters dark brown to black (New Guinea, Bismarck Arch., Solomon Is., Amboina, SE Asia)·····**argentata** (Walker) pt.

10(9). (♀ only; ♂ unknown). Pleura entirely dark; mesonotum entirely dark except for slightly reddish humerus, abdomen entirely dark except for reddish apex of tergite 4 (New Britain) ·····**novaebritanniae** n. sp.

Pleura extensively dull yellow on upper half; mesonotum extensively dull yellow laterally at least in notopleural area; abdomen with tergites 2 and 3 in ♂ or tergite 2 in ♀, and most of venter in both sexes, whitish yellow or yellow(New Guinea)···**pallidibasis** n. sp.

11(7). Antenna elongate, in anterior view segment 3 about 6 × as long as 2 in ♂ (Fig. 101), $3\text{-}1/2$ × in ♀; 2 + 3 dorsocentrals, first postsutural twice as far from second as from suture; ♂, front very broad, narrowest opposite posterior ocelli where it is $2\text{-}1/2$ × width of ocellar triangle, frontal vitta at middle of front 7 × as broad as parafrontal; ♀, front with 1 pair of reclinate upper orbitals (Fiji)·····**effeminata** n. sp.

Antenna normal, in anterior view segment 3 about $2\text{-}1/2$ × as long as 2; 2 + 4 or 2 + 3 dorsocentrals, if the latter then first postsutural as far from suture as from second postsutural; ♂, front narrow, at most $1\text{-}1/2$ × as wide as ocellar triangle, narrowest near midlength, with frontal vitta partly obliterated or, if distinct throughout, not wider than parafrontal; ♀, front with 2 pairs of reclinate upper orbitals·····12

12(11). Tarsi black; palpus black; 2 + 4 dorsocentrals, first 2 postsuturals short but strong and distinct; ♂, hind femur, and usually mid femur, with a series of 6 or more short strong spine-like anteroventrals on apical 1/3 or more (Fig. 96, 97) (New Guinea, Bismarck Arch., Solomon Is., Amboina, SE Asia)·····**argentata**(Walker) pt.

Fore and mid tarsi yellow, at most brownish towards apex; palpus black or yellow; 2 + 3 or 2 + 4 dorsocentrals; ♂, hind femur with only normal slender anteroventral bristles···13

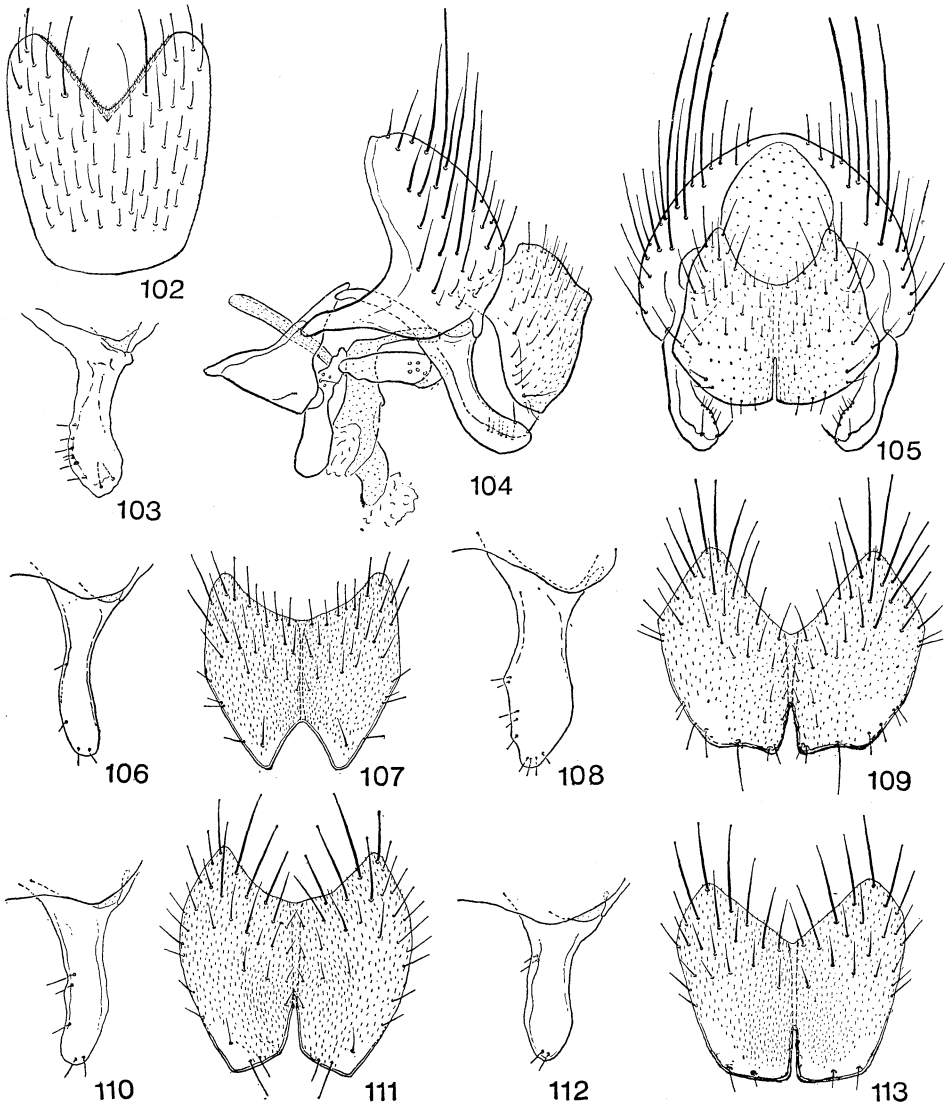

Fig. 102-113. 102-105, *Myospila laevis* (Stein), ♂: 102, sternite 5, ventral; 103, left surstylus, anterolateral; 104, terminalia, lateral (aedeagus stippled); 105, sternite 9, cerci and surstyli, posterior. 106, 107, *M. flavipennis* (Malloch), ♂: 106, left surstylus, anterolateral; 107, cerci, posterior. 108, 109, *M. setinervis* (Stein), ♂: 108, left surstylus, anterolateral; 109, cerci, posterior. 110, 111, *M. squalens* (Walker), ♂: 110, left surstylus, anterolateral; 111, cerci, posterior. 112, 113, *M. propinqua* (Stein) ♂: 112, left surstylus, anterolateral; 113, cerci, posterior.

13(12). Dorsocentrals arranged 2 + 4, first 2 postsuturals much shorter than last 2 but strong and distinct; vein R_{4+5} with at most 3 setae above and below at extreme base, in ♀ at least 1 dorsal and 1 ventral seta elongate, as long as anterior crossvein; ♂, frontal vitta distinct throughout (New Guinea) ..... **papuensis** n. sp.

Dorsocentrals arranged 2 + 3, first postsutural about 2/3 as long as second, sometimes preceded by an extremely short and weak fourth postsutural; vein R_{4+5} usually with at least 5 setae above and below at base, these setae often extending 1/4 or more of distance to anterior crossvein and all much shorter than that crossvein; ♂, frontal vitta usually obliterated on about 1/3 length of front (Fig. 98) 14

14(13). Thorax and abdomen mostly or entirely reddish yellow, at most disc of mesonotum and dorsum of abdomen blackish; wing at most slightly yellowish, never darkened 15

Thorax black, mesonotum extensively grey pollinose; abdomen black medially, extensively grey pollinose laterally, tergite 5 partly or entirely red; wing sometimes mostly pale to dark brown (Bismarck Arch.) ..... **fumidala** n. sp.

15(14). ♂, abdomen entirely reddish-yellow, with dense golden pollen laterally on tergites 3 to 5; ♀, palpus dark brown to black (Solomon Is.) ..... **aureorufa** n. sp.

♂, abdomen reddish-yellow basally, with most of tergites 3 to 4 black and with only faint greyish pollen; ♀, palpus bright yellow (New Hebrides) ..... **novaehebudae** n. sp.

Key to Regional ♀♀ of Myospila Based on Terminalia*

1. Terminalia slightly to strongly compressed at least posteriorly; tergite 7 at least 2/3 as long as width at midlength; sternite 7 either at least twice as long as broad and uniformly sclerotized or reduced to a very small posterior remnant; each half of sternite 8 elongate, broadened towards apex, with at least 4 moderately stout setae 2

Terminalia (Fig. 124) subcylindrical, not noticeably compressed; tergite 7 half as long as broad; sternite 7 twice as long as broad, weakly sclerotized laterally; each half of sternite 8 a very small weak sclerite with at most 3 fine setae ..... **pallidibasis** n. sp., **novaebrittaniae** n. sp.

2. Terminalia (Fig. 126) rather strongly compressed; tergite 7 much deeper anteriorly than posteriorly, dorsal margin strongly oblique in lateral view, posterolateral angle produced caudad; cercus subcircular, not longer than broad ..... **effeminata** n. sp.

Terminalia only slightly compressed; tergite 7 not deeper anteriorly than posteriorly in lateral view, dorsal margin horizontal, posterolateral angle produced ventrad; cercus at least 1-1/2 × as long as broad 3

3. Sternite 7 reduced to a minute sclerite at posterior margin of segment; membrane between segments 7 and 8 without distinguishable spines (Fig. 119) ..... **flavipennis** (Malloch)

Sternite 7 well developed, from 2 to 7 × as long as broad; membrane with distinct scale-like spines 4

4. Sternite 7 long and slender, about 8 × as long as broad 5

Sternite 7 broadly to narrowly suboval, from 3 to 5 × as long as broad 8

5. Each half of sternite 8 with 4 setae, apical one very much stronger than others; posterior portion of tergite 8 with lateral seta much stronger than others; membrane between

*All the regional species are included except *setosissima* n. sp.

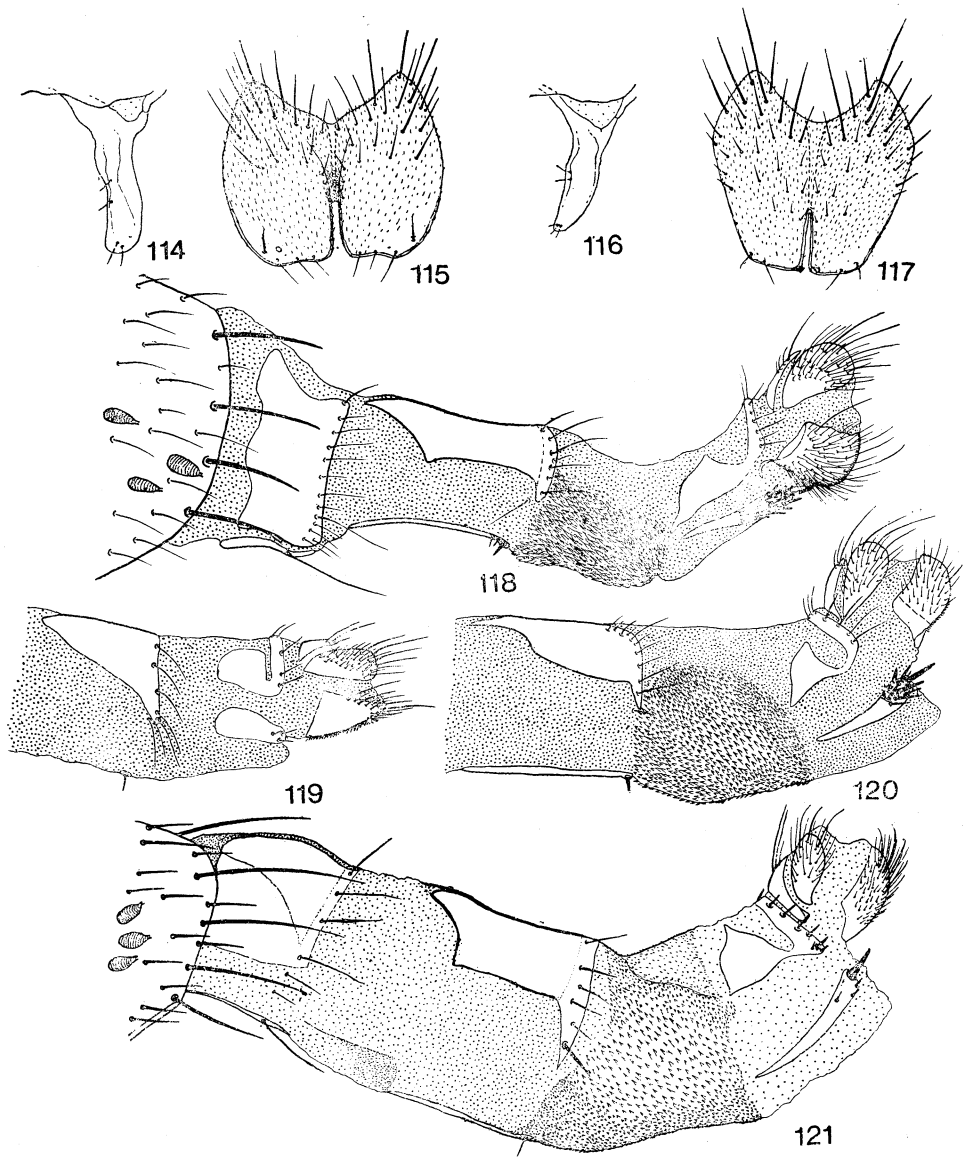

Fig. 114-121. 114, 115, *Myospila argentata* (Walker), ♂: 114, left surstylus, anterolateral; 115, cerci, posterior. 116, 117, *M. aureorufa* n. sp., ♂: 116, left surstylus, anterolateral; 117, cerci, posterior. 118-121, ♀ terminalia, lateral: 118, *M. laevis* (Stein); 119, *M. flavipennis* (Malloch) (segment 6 omitted); 120, *M. setinervis* (Stein) (segment 6 omitted); 121, *M. cincta* (Bigot).

segments 7 and 8 with small but distinct spines extending almost to mid-dorsal line (Fig. 121) ····· **cincta** (Bigot)

Each half of sternite 8 with 7 or more setae, apical one at most slightly stronger than others; posterior portion of tergite 8 with lateral seta only slightly stronger than others; membrane between segment 7 and 8 with distinct spines on at most lower 2/3 ····· 6

6. Each half of sternite 8 with not more than 12 setae; hypoproct with lower margin straight anteriorly, curved abruptly upward at about 2/3 its length, dorsolateral margin nearly straight ····· 7

Each half of sternite 8 with 14 to 16 setae; hypoproct with lower margin curved upward both anteriorly and posteriorly, dorsolateral margin produced triangularly dorsad (Fig. 118)··· ····· **laevis** (Stein)

7. Tergite 7 with anterior emargination very shallow or absent; each half of sternite 8 with 7 or 8 setae (Fig. 125) ····· **papuensis** n. sp.

Tergite 7 with anterior emargination moderately deep; each half of sternite 8 with 10 to 12 setae (Fig. 120) ····· **setinervis** (Stein)

8. Tergite 7 with anterolateral angle not produced ventrad; sternite 7 about 3 × as long as broad (Fig. 122) ····· **squalens** (Walker)

Tergite 7 with anterolateral angle produced ventrad as a slender process; sternite 7 about 5 × as long as broad (Fig. 123) ····· ···**propinqua** (Stein), **argentata** (Walker), **aureorufa** n. sp., **fumidala** n. sp., **novaehebudae** n. sp.

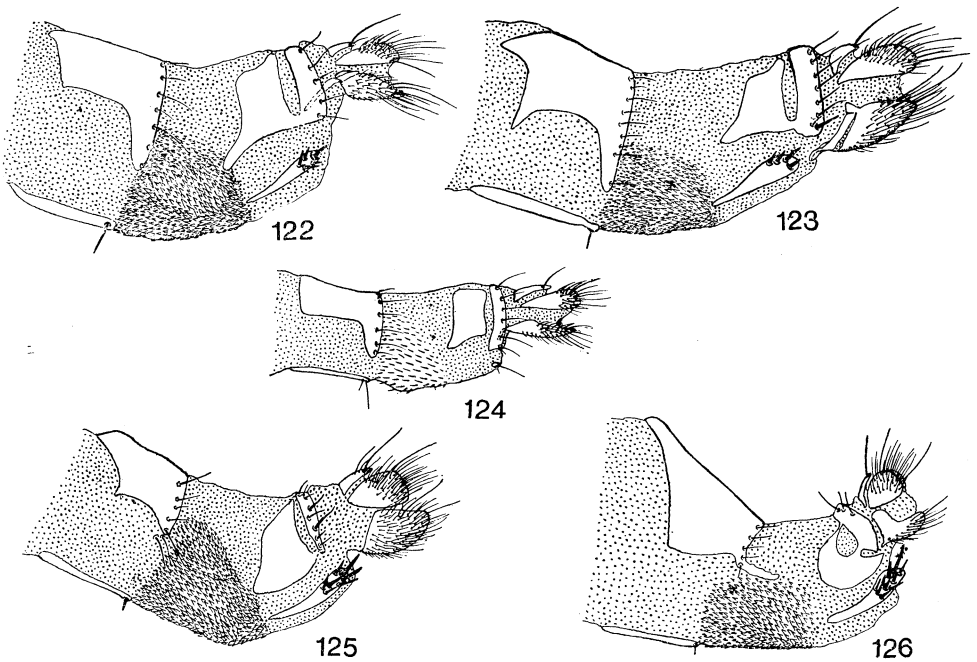

Fig. 122-126. ♀ terminalia (segment 6 omitted): 122, *M. squalens* (Walker); 123, *M. propinqua* (Stein); 124, *M. pallidibasis* n. sp.; 125, *M. papuensis* n. sp.; 126, *M. effeminata* n. sp.

Partial Key to Eggs of Regional Species of Myospila*

1. Median third of dorsal surface (except for extreme anterior end) with uniform reticulation throughout length of egg (Fig. 130, 132-135); micropyle well removed from anterior end of egg, at from 1/7 to 1/9 length of ventral surface 2

   Median third of dorsal surface with elongate tapering anterior or posterior area with at most very weak reticulation, rest of median third distinctly reticulate (Fig. 127, 128); micropyle very near anterior end of egg, at about 1/20 length of ventral surface 6

2. Dorsal surface of egg, between flanges, uniformly reticulate 3

   Dorsal surface with narrow lateral stripe on either side much darker than median portion 5

3. Anterior end of flange diagonally truncate, the flange not produced as a free filament (Fig. 135) ..... **novaebrittaniae** n. sp.

   Anterior edge of flange produced as a distinct tapering filament which is at least as long as broad 4

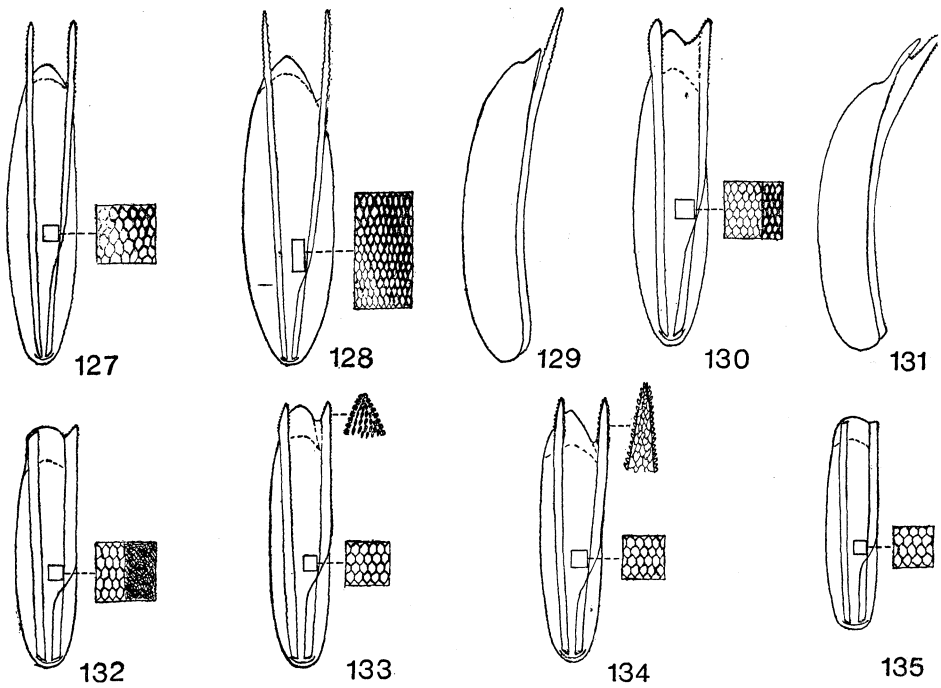

Fig. 127-135. Egg, those in dorsal view with right flange turned outward, with enlargement of surface sculpture and, in Fig. 133 and 134, with enlargement of apical filament: 127, *Myospila laevis* (Stein), dorsal; 128, *M. setinervis* (Stein), dorsal; 129, *M. setinervis*, lateral; 130, *M. fumidala* n. sp., dorsal; 131, *M. fumidala*, lateral; 132, *M. squalens* (Walker), dorsal; 133, *M. argentata* (Walker), dorsal; 134, *M. papuensis* n. sp., dorsal; 135, *M. novaebrittaniae* n. sp., dorsal.

*The only available egg of *cincta* from a New Guinea ♀ has the anterior filaments broken; it would apparently run to couplet 4 in the key.

4. Anterior filament broadly triangular, about as long as basal width, margins with short regular truncate papillae (Fig. 133) ..... **argentata** (Walker)

Anterior filament slender and tapering, about 3 × as long as its basal width, margins with slender irregular papillae (Fig. 134)..... **papuensis** n. sp.

5. Dorsal surface of egg with median 3/5 distinctly reticulate, lateral 1/5 on each side dark, apparently thickened and without distinct reticulation; anterior filament in form of an equilateral triangle, about 1/18 as long as body of egg (Fig. 132)..... **squalens** (Walker)

Dorsal surface of egg with only very faint reticulation on median 3/5, lateral 1/5 on each side with dark but distinct reticulation; anterior filament in form of an elongate triangle, 1-1/2 × as long as its basal width and about 1/12 as long as body of egg (Fig. 130)..... **fumidala** n. sp.

6. Anterior filament about 4 × as long as its basal width and about 1/6 as long as body of egg; anteromedian 2/3 of dorsal surface of egg without distinct reticulation, lateral margins and posterior 1/3 of dorsal surface with distinct to faint hexagonal reticulation (Fig. 127) ..... **laevis** (Stein)

Anterior filament about 8 × as long as its basal width and about 1/3 as long as body of egg; anterior 2/3, and most of lateral margin, of dorsal surface of egg with distinct hexagonal reticulation, posteromedian 1/3 without apparent reticulation (Fig. 128)..... **setinervis** (Stein)

Myospila laevis (Stein), n. comb. Fig. 94, 99, 100, 102-105, 118, 127.

Spilogaster laevis Stein, 1900, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **40:** 7.
Mydaea laevis, Stein, 1919, *Arch. Naturgesch.* (1917), **83**A(1): 120.
Lasiopelta laevis, Pont, 1966, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **76**: 98.
Spilogaster arminervis Stein, 1900, *Természetr. Füz.* **23:** 138. **N. syn.**
Mydaea arminervis Stein, 1915, *Supplta Ent.* **4:** 23; 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 152, 186; Hennig, 1952, *Beitr. Ent.* **2:** 86.
Xenosina arminervis, Hennig, 1952, *Beitr. Ent.* **2:** 86.
Lasiopelta arminervis, Pont, 1969, *Dt. Ent. Z.*, N.F. **16:** 82.
Spilogaster livida Stein, 1907, *Z. Syst. Hymenopt. Dipterol.* **7:** 278.
Xenosina tarsalis Malloch, 1935, *Ann. Mag. Nat. Hist.* (**10**)**16:** 232; van Emden, 1965, *Fauna India, Diptera* **7**(1): 446. **N. syn.**
Lasiopelta tarsalis, Pont, 1968, *Ent. Meddr* **36:** 179.
Xenosina scutellaris Malloch, 1935, *Ann. Mag. Nat. Hist.* (**10**)**16:** 233. **N. syn.**
Xenosina tarsalis var. *scutellaris*, van Emden, 1965, *Fauna India, Diptera* **7**(1): 448.

Large robust dark-bodied species with indistinctly striped thorax, almost unmarked abdomen and mostly pale legs. Length 5.9 to 8.1 mm.

♂. Head (Fig. 99, 100) black, parafrontal and parafacial silvery pollinose; face, cheek and occiput slightly grey or greyish-white pollinose. Front at narrowest point slightly wider than ocellar triangle, frontal vitta distinct throughout, at narrowest point as wide as parafrontal. Front with entire row of orbitals decreasing in length and strength caudad, ending in a moderately strong reclinate bristle situated opposite anterior margin of anterior ocellus. Antenna and palpus black, the latter moderately slender throughout.

Thorax black; mesonotum densely olive-brown pollinose, with greyish pollen anteriorly, in posterodorsal view with narrow indistinct darker lines just mediad and just laterad of the row of dorsocentrals;

scutellum slightly reddish below level of marginal bristles and sometimes on disc; pleura slightly grey pollinose. Dorsocentrals arranged 2+4, strong; anterior intraalar strong; prealar very weak, scarcely distinguishable. Postalar declivity with a few short stiff black hairs at midlength near ventral margin. Suprasquamal ridge with a few short stiff black hairs near anterior end. Scutellum bare below level of marginal bristles. Sternopleural bristles 2:2, the lower anterior weak but distinct. Beret with about 8 short stiff erect black hairs. Posterior spiracle large, about $1\text{-}^1/_2 \times$ as long as beret, with 4 or 5 long fine black setae in anteroventral fringe. Prosternum with many hairs, metasternum with a few hairs, sternite 1 bare. Wing yellowish at base and anteriorly. Vein R_1 bare or with 1 to 3 setae above on about second fourth of its length. Vein R_{4+5} with dorsal setae extending at most one quarter of the way and ventral setae at most halfway to anterior crossvein. Veins M_{1+2} and M_{3+4} bare. Apex of M_{1+2} curved moderately forward (Fig. 94). Posterior crossvein rather strongly sinuate. Squamae and haltere dark yellow. Legs yellow brown, coxae dark brown anteriorly or laterally, fore femur blackish on basal half or slightly more, tarsi darker, becoming blackish apically. Mid femur with an entire row of anteroventrals and of posteroventrals which decrease in length towards apex, latter slightly longer and stronger than former, on basal half as long as femoral diameter. Hind femur with an entire row of anteroventrals. Mid tibia with 2 posterior bristles. Hind tibia with 2 anterodorsals and 2 anteroventrals.

Abdomen black, densely olive-brown pollinose, without distinct markings. Terminalia (Fig. 102-105): Cerci fused on upper 2/3 of approximated portion. Cercus very broad, broadly rounded apically. Surstylus in anterolateral view slightly broadened on apical half. Postgonite suddenly compressed at 3/4 its length, weakly sclerotized apically. Aedeagal spine broadest at apex.

♀. Very similar to ♂, differing as follows: Thorax often more extensively reddish, in palest specimens only disc of mesonotum and lower part of sternopleuron black. Prealar bristle short but distinct. Scutellum with one fairly regular row of lateral hairs below level of marginal bristles. Spiracle about as long as beret. Sternite 1 with a few lateral hairs. Vein R_1 with about 8 setae above and with 2 or 3 below on basal half. Vein R_{4+5} setose above almost to or slightly beyond anterior crossvein, setose below to a point well beyond crossvein, 1 ventral seta near base slightly longer than anterior crossvein. Legs paler, fore femur darkened at most above, in palest specimens legs entirely dark yellow except for darker tarsi. Mid femur with anteroventral and posteroventral bristles shorter and stronger than in ♂. Mid tibia with 2 or 3 posterior bristles. Hind tibia with 2 or 3 anterodorsals and 1 or 2 anteroventrals. Terminalia (Fig. 118): Tergite 7 longer than broad, anterior emargination very narrow, submedian processes moderately long and broad. Sternite 7 very slender, about $8 \times$ as long as broad, near apex with 2 very short stout setae and sometimes also several weak setae. Tergite 8 with anterolateral portions broadly separated medially, subtriangular with dorsal apex truncate, narrowly joined sublaterally to posterior portion of tergite, latter very short medially and broader laterally, setae of posterior margin fine and mostly long. Halves of sternite 8 long, broad posteriorly, each with 14 to 16 setae on posterior half or slightly less, setae very short and fine anteriorly, increasing fairly regularly in size posteriorly, 1 or 2 near apex distinctly longer and stronger than others. Epiproct about as long as broad, posterolateral margins slightly convex. Cercus broad at base, about $1\text{-}^1/_2 \times$ as long as broad, bluntly rounded to subtruncate apically. Hypoproct curved dorsad both anteriorly and posteriorly so lower margin is almost semicircular in profile, the dorsal margin of each side obtusely triangular.

Egg (Fig. 127). Anterior filaments slender, tapering, about 1/6 as long as body of egg, margins only obscurely papillate. Anterior end of egg broadly rounded, not produced as distinct anteromedian process. Anterior filament and about anterior 2/3 of flange (apparently on both surfaces) with coarse dark scale-like reticulation, the reticulate area becoming narrower on posterior part of flange, most of posterior 1/3 of flange without distinct markings; extreme anterior end of dorsal surface of egg minutely papillate; dorsal surface of egg laterally, near base of flange, with coarse dark hexagonal reticulation, the reticulation becoming fainter posteriorly and on posterior 2/5 covering entire dorsal

surface; median 3/4 of anterior 3/5 of dorsal surface with very faint irregular reticulation which contrasts strongly with dark lateral reticulation; rest of surface of egg with very faint hexagonal reticulation. Micropyle very near anterior end of egg. One abdomen with 5 eggs examined.

DISTRIBUTION. New Guinea (0-2500 m), Ternate I., N Borneo, Ceylon, India, Malaya, Philippines, Taiwan.

Type localities and types. Spilogaster laevis Stein: Ternate I. Holotype ♂ in MCSNG (Pont, 1966b).

Spilogaster arminervis Stein: Ternate I. Lectotype ♀ in MCSNG (Pont, 1969a).

Spilogaster livida Stein: Ternate I. Holotype ♀ presumably in Bigot Coll., Hope Dept., Oxford.

Xenosina tarsalis Malloch: Fraser's Hill, Pahang, Malaya, 6000'. Holotype ♂ in BMNH (Pont, 1968a).

Xenosina scutellaris Malloch: Gunung Benom, Pahang, Malaya, 6000'. Holotype ♀ in BMNH (Pont, 1968a).

I have examined 1 ♂ from New Guinea compared by Pont with the types of *laevis* and *tarsalis*, and 3 ♀♀ from New Guinea compared by Pont with the types of *arminervis* and *scutellaris*. All 4 of these specimens are undoubtedly conspecific. *Spilogaster livida* Stein was synonymized with *S. arminervis* Stein at the time of its description.

SPECIMENS EXAMINED (BISHOP, BMNH, CNC, AMS, UZMC). NW NEW GUINEA: 8 ♂♂, 3 ♀♀, Wisselmeren, Enarotali, 1742 to 2000 m, various dates in July, Aug., J. L. Gressitt, J. Sedlacek; 1 ♂, Wisselmeren, Waghete, Tigi Lake, 1700 m, 16. VIII. 1962, Gressitt; 1 ♂, Wisselmeren, Duroto, E of Enarotali, 1800 m, 21. VIII. 1962, Gressitt; 14 ♂♂, 22 ♀♀, Wamena, 1700 m, 10-25. II. 1960, T. C. Maa; 1 ♂, 3 ♀♀, Kulima, 1400 m, 19-22. II. 1960, Maa; 1 ♀, Sacremeba Village, W of Lake Anggi Giji, Vogelkop, 1850 m, 1. VIII. 1957, D. E. Hardy; 1 ♀, Fak Fak, S coast of Bomberi, Vogelkop, 10-100 m, 11. VI. 1959, Gressitt; 1 ♀, Waris, S of Hollandia, 450-500 m, 16-23. VIII. 1959, ex human excrement, Maa; 4 ♀♀, Hollandia, 0-300 m, various dates in Aug., Dec.-Jan., Gressitt, S. & L. W. Quate; 1 ♀, Cyclops Mts, Ifar, 300 m, 20. VI. 1959, ex human excrement, Maa; 1 ♀, Hittikima, 100 m, 19. II. 1960, Maa. SW NEW GUINEA: 1 ♀, Moke, 1. X. 1957, J. Smart. NE NEW GUINEA: 1 ♂, Maprik, 150 m, 29. XII. 1959 - 17. I. 1960, Maa; 1 ♂, 2 ♀♀, Bainyik, S of Maprik, 150 m, 12. I. 1960, Maa; 1 ♂, Bainyik, 2. XII. 1963, D. K. McAlpine; 1 ♂, 1 ♀, Moife, 15 km NW of Okapa, 2100 m, 7-14. X. 1959, Maa; 3 ♂♂, 2 ♀♀, Daulo Pass area, 2500 m, 5. VII. 1957, Hardy; 1 ♀, Daulo Pass, 2400 m, 7. VII. 1963, Sedlacek; 2 ♀♀, Daulo Pass, 2492 m, 31. V. 1965, R. W. Crosskey; 2 ♂♂, 2 ♀♀, Wanuma, Adelbert Mts, 800-1000 m, 23-26. X. 1958 (1 ex human excrement), Gressitt; 1 ♂, Mt Otto, 2200 m, 24. VI. 1955, Gressitt; 1 ♂, 1 ♀, Sepalakambang, Sarawaged Range, 1920 m, 15. IX. 1956, E. J. Ford; 1 ♂, Kainantu, 1650 m, 25-30. IX. 1959, mercury vapor light trap, Maa; 1 ♂, Nondugl, 2200-2700 m, 28. V. 1959, C. D. Michener; 1 ♂, 1 ♀, Sepik, Maprik area, 160 m, 23, 27. VIII. 1967, Hardy; 3 ♀♀, Aiyura, 1620 m, 19-24. X. 1959, Maa; 3 ♀♀, Laiagam, 2100 m, 20. VII. 1963, M. Sedlacek; 1 ♀, Wewak, 2-20 m, 11. X. 1957, Gressitt; 1 ♀, Sibog Village, Saidor, Finisterre Range, 27. V - 5. VI. 1958, W. W. Brandt; 1 ♀, Tapo, 3 km NW of Kainantu, 1650 m, 22. X. 1959, Maa; 1 ♀, Gewak, Sarawaged

Range, 1530 m, 7. IX. 1956, Ford; 1 ♀, Goroka, 1650 m, 14. V. 1966, Gressitt; 1 ♂, Goroka, 25-29. V. 1965, Crosskey; 1 ♂, 6 ♀♀, Wau, 1067-1220 m, 14-23. V. 1965, Crosskey; 1 ♀, Gembogl area, nr Mt Wilhelm, 26. V. 1964, on freshly killed pigs, J. Bryan. SE NEW GUINEA: 9 ♂♂, 25 ♀♀, Dimifa, SE of Mt Giluwe, 2200 m, 9-13. X. 1958, Gressitt; 1 ♂, Aiyurop-Rumpi, S Highlands, 14. X. 1958, Gressitt; 1 ♀, Mendi, 1600 m, 13. X. 1958, Gressitt; 1 ♀, N of Mendi, 1800 m, 8. X. 1958, Gressitt; 1 ♀, Kokoda, 366 m, VII. 1933, L. E. Cheesman; 1 ♀, Kokoda, 3, I. 1964, McAlpine; 1 ♂, 1 ♀, Woitape, Wharton Range, 19. X. 1963, McAlpine.

I have examined also 2 ♂♂ from N Borneo and S India and 15 ♀♀ from N Borneo, Ceylon and S India (BISHOP, CNC) and find no significant differences between these and the New Guinea specimens.

DISCUSSION. *M. laevis* is the only regional species of the genus with the beret haired and the pteropleuron bare. In *laevis* vein R_1 has far more dorsal setae in the ♀ than in the ♂; in *setinervis*, the only other regional species known to have R_1 setose in both sexes (the ♂ of *setosissima* is unknown), the vein is as densely setose in the ♂ as in the ♀. The hypoproct in *laevis*, with the anterior half curved upward, differs in shape from that of the other species examined.

Myospila setosissima Vockeroth, new species

Large robust species with dark indistinctly striped thorax and mostly pale legs.

♀. Length (minus abdomen) 5.0 mm, total length ca 7.4 mm. Head color as in *laevis*. Antenna dark yellow. Palpus with about basal 1/3 dark brown, otherwise bright yellow.

Thorax black, mesonotum and disc of scutellum blue-grey pollinose; mesonotum with a pair of narrow blackish stripes inside dorsocentral rows which broaden and fuse in the prescutellar area, with a brownish median stripe and with a blackish sublateral area on each side; scutellum with a blackish median stripe. Pleura slightly grey pollinose. Dorsocentrals arranged 2 + 4, strong; anterior intraalar absent; prealar distinct, about half as long as posterior notopleural. Scutellum with 2 or 3 lateral hairs immediately below level of marginal bristles, with many finer hairs at lower margin of lateral surface and on under surface near lateral margin. Sternopleural bristles 1:2. Beret bare. Posterior spiracle moderate, about 3/4 as long as beret. Prosternum with many hairs; metasternum with a few hairs; sternite 1 bare. Wing yellowish at base and anteriorly. Vein R_1 above with strong setae on about basal 7/8, below with 2 or 3 weaker setae opposite fork of Rs and 3 or 4 opposite end of subcosta. Vein R_{4+5} above with strong setae extending slightly beyond anterior crossvein, below with weaker setae extending well beyond crossvein, 1 of the ventral setae near base about twice as long as crossvein. Vein M_{3+4} at base with 3 to 6 rather long setae above and 3 below. Vein M_{1+2} with apex curved very slightly forward. Posterior crossvein slightly sinuate. Squamae and haltere dark yellow; fore and mid trochanters dark brown, hind trochanter slightly brownish; fore femur brownish basally except below, the brown color extending almost to apex dorsally and to about midlength anteriorly and posteriorly. Mid femur with weak anteroventrals, with 2 strong and several weaker posteroventrals on basal half. Hind femur with 2 or 3 weak anteroventrals on basal half and 2 or 3 strong anteroventrals near apex. Mid tibia with 3 posterior bristles. Hind tibia with 2 anterodorsals, 1 anteroventral. Abdomen missing except for sternite 1.

♂. Unknown.

DISTRIBUTION. New Guinea.

Holotype ♀ (BISHOP 9608), Nabire, S Geelvink Bay, NW New Guinea, 1-30 m, 2-9. VII. 1962, J. L. Gressitt.

DISCUSSION. This is the only regional species with the base of vein M_{3+4} setose. A ♀ from Ceylon in the CNC has wing setae as in *setosissima*, but has the antenna and palpus entirely black rather than yellow.

Myospila setinervis (Stein), n. comb. Fig. 108, 109, 120, 128, 129.

Spilogaster setinervis Stein, 1900, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **40:** 385.

Mydaea setinervis, Stein, 1919, *Arch. Naturgesch.* (1917), **83**A(1)**:** 124.

Lasiopelta setinervis, Pont, 1966, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **76:** 100.

Large robust species with dark obscurely striped thorax, dark abdomen and dark femora. Length 6.7 to 7.8 mm.

♂. Head color as in *laevis*. Front at narrowest point scarcely wider than ocellus; frontal vitta obliterated on about 1/4 length of front. Orbital bristles as in *laevis* but the 2 or 3 pairs in front of upper reclinate pair very short, the upper reclinate pair situated distinctly in front of level of anterior ocellus. Antenna dark yellow, segment 3 sometimes brownish towards apex. Palpus dark brown to black, of uniform width throughout.

Thorax black; mesonotum and scutellum bluish-grey pollinose, former with a pair of faint submedian stripes lying just inside dorsocentral bristles and fusing and becoming less distinct in prescutellar area, latter with enterolateral angles brown pollinose. Pleura slightly grey pollinose. Dorsocentrals arranged 2 + 4, strong; anterior intraalar absent; prealar very weak, scarcely distinguishable. Postalar declivity and suprasquamal ridge bare. Scutellum bare below level of marginal bristles. Sternopleural bristles 1:2. Beret bare. Posterior spiracle large, about $1\text{-}^1/_2 \times$ as long as beret, without setae in fringe. Prosternum with many hairs; metasternum with a few hairs; sternite 1 bare. Wing yellowish at base and anteriorly. Vein R_1 with strong setae above from base almost to apex, with at most 1 seta below near level of apex of vein Sc. Vein R_{4+5} setose above and below from base about halfway to anterior crossvein. Apex of M_{1+2} curved slightly but distinctly forward. Posterior crossvein slightly sinuate. Squamae and haltere dark yellow. Legs with coxae, trochanters and femora except apices blackish-brown, otherwise dark yellow, tarsi becoming slightly darker apically. Femoral bristles as in *laevis*. Mid tibia with 2 strong and 1 weaker posterior bristle. Hind tibia with 2 anterodorsals and 2 anteroventrals.

Abdomen black, bluish-grey pollinose, in posterodorsal view tergites 2 and 3 with irregular brownish areas laterally. Terminalia (Fig. 108, 109): Cerci fused on upper 3/5 of approximated portion. Cercus slightly narrowed to truncate apex. Surstylus slightly broadened on apical half, anterior margin slightly concave near apex. Postgonite broad almost to apex, curved slightly ventrad just before apex. Aedeagal spine broadest just before broadly rounded apex.

♀. Very similar to ♂, differing as follows: Mesonotum with narrow entire black stripe laterad of dorsocentrals, with a broader brownish median stripe, and with a narrow black postsutural stripe laterad of dorsocentrals. Prealar distinct, about half as long as posterior notopleural. Scutellum with an irregular single or partly double row of lateral hairs below level of marginal bristles. Posterior spiracle as long as beret. Vein R_1 below sometimes with 1 seta near level of fork of R_5, almost always with 1 to 5 setae near level of apex of Sc. Vein R_5 with 1 or 2 weak setae below before fork. Vein R_{4+5} above with strong setae from base to anterior crossvein or slightly beyond it, below with slightly weaker setae from base to well beyond crossvein; 2 or 3 ventral setae at base elongate, longest one at least as long as anterior crossvein. Mid femur with anteroventrals and posteroventrals shorter.

Hind tibia with 2 or 3 anterodorsals and 2 or 3 anteroventrals. Tergites 2 and 3 darker, with blackish rather than brown markings. Terminalia (Fig. 120): Very similar to those of *laevis* but tergite 7 with anterior emargination broader and deeper and with anterior processes narrower, halves of sternite 8 with only 10 to 12 setae, epiproct not as slender and with straight posterolateral margins, and hypoproct with anterior half of lower margin straight rather than curved upward.

Egg (Fig. 128, 129). Anterior filaments slender, about 1/3 as long as body of egg, margins with short dark truncate papillae. Anterior end of egg broadly rounded, not produced as distinct process. Filament and narrow stripe near lower margin of inner surface of flange with coarse dark scale-like reticulation; extreme lower margin of inner surface of flange without reticulation; dorsal surface of egg between flanges with dark hexagonal reticulation on anterior half, this reticulation continuing caudad on a tapering lateral strip to about 4/5 length of egg, median portion of posterior half of dorsal surface, and all of posterior 1/4 of dorsal surface with very faint elongate reticulation; inner surface of flange except lower margin, outer surface of flange, and all of rest of egg surface with faint hexagonal reticulation. Micropyle very near anterior end of egg. One abdomen with 13 eggs examined.

DISTRIBUTION. Bismarck Arch., Solomon Is. (1-700 m).

Type locality and type. Neu-Pommern (= New Britain). Holotype ♂ in MCSNG (Pont, 1966b). I have examined 1 ♂ from Guadalcanal compared by Pont with the holotype.

SPECIMENS EXAMINED (BISHOP, BMNH, CNC, UZMC). BISMARCK ARCH.: 2 ♀♀, Lemkamin, New Ireland, 12, 14. IV. 1962; 1 ♀, Bainings, St. Pauls, Gazelle Penin., New Britain, 350 m, 8. IX. 1955, J. L. Gressitt. SOLOMON IS.: 1 ♂, Lunga, Guadalcanal, 28. III. 1934, R. A. Lever; 1 ♂, Ruavatu, Guadalcanal, 29. IV. 1934, Lever; 1 ♂, Paripao, Guadalcanal, 22. V. 1960, C. W. O'Brien; 2 ♀♀, Auki, Malaita, 2-20 m, 2, 3. X. 1957, Gressitt; 2 ♀♀ Auki-Tangtalau, Malaita, 25-200 m, 23. IX. 1957, Gressitt; 1 ♀, Tangtalau, Malaita, 200 m, 26. IX. 1967, Gressitt; 1 ♀, Molao, Santa Ysabel, 29. VI. 1960, O'Brien; 1 ♀, Buin, Bougainville I., 3. VI. 1956, Gressitt; 1 ♀, Gollifer's Camp, Kolombangara, 700 m, 24. I. 1964, P. Shanahan; 1 ♀, Munda, New Georgia I., 1-30 m, 19. VII. 1959, Gressitt.

DISCUSSION. This species is superficially very similar to *laevis* but the considerable number of differences in structure between the 2 forms indicate that *setinervis* is undoubtedly ad istinct species and not an allopatric form of *laevis*. The unknown ♂ of *setosissima* n. sp. will possibly agree with the ♂ of *setinervis* in having vein R_1 with numerous dorsal setae, but the ♂ of *setosissima* is likely to have vein M_{3+4} setose basally as does the ♀ of that species.

Myospila flavipennis (Malloch), n. comb. Fig. 106, 107, 119.

Pahangia flavipennis Malloch, 1928, *Ann. Mag. Nat Hist.* (**10**)**2:** 311; Séguy, 1937, *Genera Insect.* **205:** 341.

Xenosina flavipennis, van Emden, 1965, *Fauna India, Diptera* **7**(1): 453.

Lasiopelta ? flavipennis, Pont, 1968, *Ent. Meddr* **36:** 175.

Large, rather slender, mostly shining black species with yellowish wings and dark legs. Length 6.3 to 7.4 mm.

♂. Head black; parafrontal and parafacial silvery pollinose, face greyish-white pollinose, cheek and occiput very slightly grey pollinose. Front at narrowest point only slightly wider than anterior ocellus, frontal vitta obliterated on about 1/5 frontal length. Orbital bristles in 5 to 6 pairs decreasing only slightly in length caudad and covering only slightly more than lower half of front, with an additional moderately strong reclinate pair a short distance in front of anterior ocellus. Antenna and palpus black, latter slender throughout.

Thorax black, shining to subshining; disc of mesonotum with rather dense bluish-grey pollen (which extends laterad to level of posthumeral bristle) and with a narrow posteriorly-broadened black stripe on each side just mediad of dorsocentrals; disc of scutellum bluish-grey pollinose with broad black median stripe; pleura very faintly grey pollinose. Dorsocentrals arranged 2 + 4, strong; anterior intraalar usually absent, present but weak on one side of 1 specimen; prealar scarcely distinguishable. Postalar declivity and suprasquamal ridge bare. Scutellum without lateral hairs. Beret bare. Posterior spiracle small, about 2/3 as long as beret. Prosternum with rather numerous lateral hairs; metasternum with a few hairs; sternite 1 bare. Wing distinctly yellowish, at most a little paler posteriorly. Vein R_1 bare. Vein R_{4+5} setose above from base to about halfway to anterior crossvein, setose below on at most basal 1/4 of first section. Vein M_{1+2} curved slightly but distinctly forward at apex. Posterior crossvein very slightly curved. Squamae dark yellow; haltere with yellow stem and yellow to yellow brown knob. Legs very dark brown to black, fore and mid tibiae sometimes very slightly paler. Mid femur with very weak anteroventrals of which 6 or 7 on basal half are a little more distinct, and with 4 or 5 moderately strong posteroventrals, about as long as femoral diameter, on basal half. Hind femur with an entire row of weak anteroventrals which become gradually longer and stronger toward apex. Mid tibia with 3 posterior bristles. Hind tibia with 1 anterodorsal and 1 anteroventral.

Abdomen black, in posterodorsal view with moderate to rather dense blue grey pollen. Terminalia (Fig. 106, 107): Cerci fused on upper 4/5 of approximated portion. Cercus with narrowed and bluntly rounded apical point. Surstylus nearly parallel-sided, only slightly narrowed toward apex. Postgonite narrowed slightly toward apex, curved slightly caudad just past midlength. Aedeagal spine gradually broadened on basal 3/4, then narrowed to broadly rounded apex.

♀. Very similar to ♂, differing as following: Prealar weak but distinct, about half as long as posterior notopleural. Vein R_{4+5} above with setae extending about 3/4 the distance, below about 1/2 the distance, to anterior crossvein. Abdomen shining black, without pollen. Terminalia (Fig. 119): Tergite 7 longer than broad, with broad rounded anterior emargination, gradually and uniformly broadened caudad, anterior processes short. Sternite 7 present only as a minute rounded sclerite with 2 moderately long setae. Tergite 8 with anterolateral portions subrectangular, slightly elongate, rather broadly and distinctly joined to posterior portion of tergite, latter with long setae medially and shorter setae laterally. Halves of sternite 8 weak but moderately long, each with 2 slender apical setae set on tubercles and 1 or 2 shorter setae. Epiproct rather short, about 2/3 as long as broad. Cercus about twice as long as broad, rounded apically. Hypoproct deep anteriorly, triangular in lateral view, lower margin sloping gradually upward from front to back. Spines not discernible on membrane between segments 7 and 8.

DISTRIBUTION. New Guinea, Bismarck Arch., Solomon Is. (1-750 m), Malaya.

Type locality and type. Gunung Benom, Pahang, Malaya, 5000'. Holotype ♂ in BMNH (van Emden, 1965). I have examined a ♂ from New Guinea compared by Pont with the type.

SPECIMENS EXAMINED (BISHOP, BMNH, CNC, UZMC). NW NEW GUINEA: 1 ♂, Humboldt Bay, 62-93m, IV. 1936, L. E. Cheesman. BISMARCK ARCH.: 2 ♂♂, Lemkamin, New Ireland, 11, 12. IV. 1962; 1 ♂, Sumuna, Dyaul, 8. III. 1962; 1 ♀,

Ridge above Camp Bishop, 15 km up Kait R., New Ireland, 250-750 m, 13. VII. 1956, light trap, J. L. Gressitt. SOLOMON IS.: 2 ♂♂, Kokure, Bougainville I., 690m, 10, 12. VI. 1956, E. J. Ford Jr.; 1 ♂, Gollifer's Camp, Kolombangara, 100 m, 22. I. 1964, P. Shanahan; 1 ♂, Munda, New Georgia I., 1-30 m, 20. VII. 1959, Gressitt.

Discussion. I have examined 2 ♂♂ of *flavipennis* from Mt Brinchang, Pahang, Malaya. They seem to differ from the ♂♂ listed above only in having the legs yellow brown instead of black or nearly black and in having the pollen of the mesonotum, scutellum and abdomen with a distinct brownish tint instead of being uniformly blue-grey.

The ovipositor of *flavipennis* is less strongly sclerotized than that of other regional species with haired prosternum. The great reduction of sternite 7, the very weak armature of the halves of sternite 8 and the apparent lack of spines on the membrane between sternites 7 and 8 are all characters not found in other regional species of this group. *Myospila nudisterna* (Pont), from the Philippines, Borneo, and Malaya also has sternite 7 reduced to a small posterior remnant but it has the prosternum bare and differs in many other respects from *flavipennis*.

Myospila squalens (Walker), n. comb. Fig. 95, 110, 111, 122, 132.

Aricia squalens Walker, 1859, *J. Proc. Linn. Soc.* **3:**130.
Spilogaster squalens, Stein, 1901, *Z. Syst. Hymenopt. Dipterol.* **1:** 211.
Mydaea squalens, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 180.
Lasiopelta squalens, Pont, 1966, *Ann. Mag. Nat. Hist.* (**13**)**9:** 98; 1969, *Dt. Ent. Z.*, N. F. **16**: 89.
Spilogaster leucocerus Bigot, 1885, *Ann. Soc. Ent. Fr.* (1884), (**6**)**4:** 291.
Spilogaster unistriata Stein, 1900, *Termêszetr. Füz.* **23:** 141.

Medium-sized robust species. Thorax pale grey with broad black median stripe. Abdomen reddish with dark median markings or entirely dark. Length 4.4 to 7.0 mm.

♂. Head black; parafrontal and parafacial silvery pollinose; face, cheek and occiput pale grey pollinose. Front at narrowest point about $1\text{-}^1/_2$ × as wide as ocellar triangle, frontal vitta obliterated on about 1/3 length of front, parafrontal rather broad. Orbital bristles strong, in 4 or 5 pairs, decreasing only slightly in length caudad, a very weak short pair at 2/3 length of front, and a short weak proclinate pair a short distance before lower ocellus. Antenna with first 2 segments dark yellow, third very pale yellow. Palpus usually black, rarely obscurely yellowish, very slightly broadened.

Thorax black, humeral and notopleural area sometimes obscurely dull yellow; mesonotum densely silvery-grey pollinose except for broad black median stripe (which extends laterad almost to dorsocentrals) and a broad black lateral stripe beginning just in front of suture and extending mediad almost to level of posterior intraalar. Disc of scutellum densely silvery-grey pollinose. Pleura with about posterior half of mesopleuron and of sternopleuron distinctly silvery-grey pollinose, otherwise very obscurely grey pollinose. Dorsocentrals arranged 2 + 3, strong, with sometimes a fourth short scarcely distinguishable postsutural in front of other 3; anterior intraalar absent; prealar short and weak, scarcely distinguishable. Beret bare. Posterior spiracle rather small, about 2/3 as long as beret. Prosternum with 2 to 6 hairs on each side; metasternum and sternite 1 bare. Wing very slightly to rather strongly yellowish. Vein R_{4+5} setose above and below on basal half or less of first section. Vein M_{1+2} usually bare, rarely with 1 or 2 short weak setae below near anterior crossvein. Vein M_{1+2} with apex curved scarcely perceptibly forward (Fig. 95). Posterior crossvein slightly

sinuate. Squamae and haltere pale yellow. Legs with coxae and femora, except narrow apices of latter, dark brown to black; trochanters, femoral apices and hind tibiae yellow-brown; fore and mid tibiae pale yellow; tarsi yellow, becoming brownish apically. Mid femur with 4 or 5 weak but distinct anteroventrals on basal 1/3, with 3 or 4 moderately strong posteroventrals on basal half. Hind femur with strong anteroventrals only near apex. Mid tibia with 2 posterior bristles. Hind tibia with 1 anterodorsal, 1 anteroventral.

Abdomen yellow-brown to orange-brown; tergite 2 usually dark brown medially; tergites 3 and 4 each with a dark brown to black median spot which, on tergite 3, is about 1/4 width of tergite along anterior margin and about 1/3 width of tergite along posterior margin, on tergite 4 proportionately a little broader; tergite 5 with dark brown triangular spot of varying size on anterior margin; sublateral margin of tergite 3 and lateral margin of tergites 4 and 5 with dark brown to black stripe; pale portions of abdominal dorsum in posterodorsal view with rather dense shining silvery pollen. Terminalia (Fig. 110, 111): Cerci fused on about upper 3/5 of approximated portion. Cercus elongate, slightly narrowed toward diagonally truncate apex. Surstylus parallel-sided. Postgonite tapering slightly to apex, curved strongly caudad at 2/3 its length. Aedeagal spine slightly but abruptly broadened at midlength, then tapering to bluntly rounded apex.

♀. Similar to ♂, differing as follows: Palpus black, distinctly broadened, broadest point slightly beyond midlength. Thorax sometimes with part or all of pleura as well as humerus and notopleuron dull yellow. Apex of scutellum sometimes slightly reddish. Vein M_{1+2} above and below with a few fine short setae usually extending to or slightly beyond anterior crossvein. Mid femur with stronger anteroventrals and posteroventrals. Abdomen without sublateral to lateral dark stripe, with dark median marks often broader and less clearly defined, in most specimens from the Bismarck Arch. abdomen entirely subshining black except for reddish posterior part of tergite 5 and sometimes dull yellow lateral portion of tergite 1. Terminalia (Fig. 122): Tergite 7 considerably broader than long, with broad shallow rounded anterior emargination and short broad anterior processes. Sternite 7 broad, suboval, about 3 × as long as its greatest width, with 2 long slender apical setae. Tergite 8 with anterolateral portions large, subquadrate, each with anterolateral projection and posteromedian projection which extends nearly to mid-dorsal line, very narrowly separated from posterior portion, latter with moderately long setae which are only slightly shorter and stouter laterally. Halves of sternite 8 slender, each with 4 short stout setae near apex, last seta only slightly longer than others. Epiproct scarcely more than half as long as broad. Cercus rather slender, about $2\text{-}^1/_2$ × as long as broad, with obliquely rounded apex. Hypoproct nearly flat, lateral and posterior margins curved only slightly dorsad.

Egg (Fig. 132). Anterior filaments very short, each an equilateral triangular projection of anterior end of flange about 1/18 as long as body of egg, margins with a few short truncate papillae. Anteromedian process short, broad, rounded, not extending to anterior end of filament. About anterior 1/5 of both inner and outer surfaces of flange with hexagonal reticulation; dorsal surface of egg between flanges with faint hexagonal reticulation on median 3/5, lateral 1/5 on each side at base of flange darker, thickened and with very obscure reticulation; rest of surface of egg with rather distinct hexagonal reticulation. Micropyle at 1/7 length of underside of egg. One abdomen with 4 eggs examined.

DISTRIBUTION. New Guinea (0-300 m), Bismarck Arch. (130-240 m), Amboina, Kai Is., Moluccas.

Type localities and types. Aricia squalens Walker: Kai I. Holotype ♀ in BMNH (Pont, 1966a).

Spilogaster leucocerus Bigot: Moluccas. Holotype ♀ presumably in Bigot Coll., Hope

Dept., Oxford.

Spilogaster unistriata Stein: Berlinhafen and Friedrich Wilhelmshafen (= Madang), New Guinea. Types lost (Pont, 1969a).

I have examined a ♂ from New Guinea compared by Pont with the type ♀ of *squalens*. *Spilogaster leucocerus* was synonymized by Stein (1907, p. 278) with *unistriata*, and the lattter was synonymized by Stein with *squalens* (1919, p. 125). Stein had examined the types of all 3 nominal species. I follow Pont (1969a, p. 89) in accepting this synonymy.

Specimens Examined (Bishop, BMNH, CNC, AMS, UZMC). INDONESIA: 2 ♀♀, Amboina, F. Muir. NW NEW GUINEA: 2 ♀♀, Ifar, 300-600 m, 20. VI. 1959, J. L. Gressitt; 2 ♀♀, Fak Fak, S coast of Bomberi, Vogelkop, 10-100 m, 11. VI. 1959, T. C. Maa; 1 ♀, Nabire, S Geelvink Bay, 0-30 m, 2-9. VII. 1962, Gressitt. NE NEW GUINEA: 3 ♀♀, Lae, 10 m, 6, 10. VII. 1957, D. E. Hardy; 1 ♀, Lae, 24. XII. 1963, D. K. McAlpine; 1 ♂, Busu R. forest, Lae area, 17. VI. 1965, R. W. Crosskey; 1 ♀, Gabumi Vill., Saidor, Finisterre Range, 1-21. VII. 1958, W. W. Brandt; 1 ♂, Kuminibus nr Maprik, 17. XII. 1963, McAlpine. BISMARCK ARCH.: 2 ♂♂, Gaulim, Gazelle Penin., New Britain, 130 m, 28. X. 1962, J. Sedlacek; 1 ♀, 10 km E of Keravat, New Britain, 180 m, 16-20. XI. 1959, Maa; 1 ♀, Keravat, New Britain, 23-30. VI. 1965, Crosskey; 1 ♂, 1 ♀, Valoka, New Britain, 7, 10. VII. 1962; 1 ♂ Kavieng, New Ireland, 2. VII. 1959, Gressitt; 1 ♀, Camp Bishop, 12 km up Kait R., New Ireland, 240 m, 12. VII. 1956, E. J. Ford Jr.; 5 ♂♂, 2 ♀♀, Talumalaus, Mussau, 21. I, 9. II. 1962; 1 ♀, Banatam, New Hanover, 25, III. 1962; 1 ♀, Dyaul, Sumuna, 7. III. 1962; 1 ♀, Manuan Plantation, Duke of York I., 20. VII. 1962.

Discussion. The distinctive mesonotal pattern of a black median stripe and black postsutural margins on a pale grey background, as well as the presence of setae on the underside of vein M_{1+2} in the ♀ (and sometimes in the ♂), distinguishes *squalens* from all other regional species of *Myospila*.

Myospila cincta (Bigot), n. comb. Fig. 121.

Hydrophoria cincta Bigot, 1885, *Ann. Soc. Ent. Fr.* (1884), (**6**)**4:** 276.
Spilogaster cincta, Stein, 1907, *Z. Syst. Hymenopt. Dipterol.* **7:** 217.
Mydaea cincta, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 181.

Large robust species with black thorax bearing a broad pale grey presutural band and a narrower prescutellar band, and with abdomen red-orange or black. Length 6.7 to 7.8 mm.

♂. Head black; parafrontal, parafacial, face and occiput between eye and postorbital setae densely silvery pollinose, cheeks and rest of occiput very slightly grey pollinose. Front at narrowest point twice as wide as ocellar triangle, frontal vitta at this point almost as wide as parafrontal. Orbital bristles present on all but about 1/7 of front, lowest pair strong, others decreasing rapidly in size caudad, last pair weak and proclinate and situated a short distance in front of anterior ocellus. Antenna pale yellow, segment 1 and all of 2 except apex blackish. Palpus entirely black or black with about apical half dark yellow, slightly broadened.

Thorax black, moderately shining; mesonotum densely pale grey pollinose presuturally and in

front of scutellum, prescutellar grey band covering about half of postsutural area and poorly defined anteriorly; pleura with about posterior 2/3 of mesopleuron and of sternopleuron moderately grey pollinose. Dorsocentrals arranged 2 + 4, postsuturals increasing in length caudad, with first one about as long as first presutural; anterior intraalar absent; prealar distinct, moderately strong, about 2/3 as long as posterior notopleural. Postalar declivity and suprasquamal ridge bare. Anterior mesopleural declivity with fine black hairs extending almost to anterior spiracle on about upper half. Pteropleuron with about 10 moderately long and strong black hairs on anterior half of subalar ridge. Beret bare or with up to 6 fine black hairs. Posterior spiracle small, about half as long as beret. Prosternum, metasternum and sternite 1 bare. Wing slightly yellowish near base. Vein R_{4+5} setose above on about basal 1/3 of first section, setose below only at extreme base. Vein M_{1+2} with apex curved barely perceptibly forward. Posterior crossvein slightly bent or moderately sinuate. Legs yellow, fore and mid tibiae dark yellow to yellow brown, hind tibia dark brown. Mid femur with anterior bristle at midlength preceded by a row of only slightly shorter bristles, with anteroventral bristles moderately long at base of femur and decreasing in length from about end of basal 1/3 to near apex, with posteroventral bristles moderately long on about basal 1/3. Hind femur with entire row of anteroventrals which are longer on about apical 1/4 of femur. Mid tibia with 2 posterior bristles. Hind tibia with 1 anterodorsal and 2 or 3 anteroventrals.

Abdomen shining, entirely red-orange or entirely black. Terminalia not examined.

♀. Very similar to ♂, differing as follows: Palpus black, distinctly broadened, apical half of almost uniform width. Beret bare or with a single hair. Vein R_{4+5} with setae extending a little farther beyond base. Hind femur with 2 weak posteroventrals on basal 1/3. Hind tibia with 1 anteroventral. Abdomen entirely red-orange. Terminalia (Fig. 121): Tergite 7 short and broad, anterior emargination moderately deep, anterior processes moderately broad, subtriangular. Sternite 7 long and slender, with 2 rather long apical setae. Tergite 8 with anterolateral portions subtriangular, rather broadly separated medially, narrowly joined to posterior portion, latter with posterior setae rather strong, that near lateral margin very strong. Halves of sternite 8 slender, each with 3 moderately slender setae and 1 very strong apical seta. Epiproct twice as long as broad. Cercus about $2\text{-}^1/_2\times$ as long as broad, bluntly rounded apically. Hypoproct rather shallow, curved only gradually upward posteriorly. Intersegmental membrane between segments 7 and 8 with spines stronger and more extensive than usual, extending upward almost to mid-dorsal line.

Egg. Anterior filaments and anteromedian process broken, fragmentary. Flange with well-separated minute elongate scale-like reticulation on about anterior 1/6 of inner surface; rest of inner surface of flange and dorsal surface of egg between flanges with distinct hexagonal reticulation; outer surface of flange without discernible pattern; rest of surface of egg with faint but well-defined hexagonal reticulation. Micropyle apparently at about 1/7 length of underside of egg. One abdomen with 1 egg examined.

DISTRIBUTION. New Guinea, Bismarck Arch., Ternate, Malaya.

Type locality and type. Ternate. Holotype ♀ in BMNH (Pont, *in litt.*).

I have examined 2 ♀♀ from New Guinea compared by Pont with the type.

SPECIMENS EXAMINED (BISHOP, BMNH, AMS, UZMC). NE NEW GUINEA: 1 ♂, Lae, 20. XII. 1963, D. K. McAlpine; 1 ♀, Lae, 6-20 m, 22. VII. 1959, J. L. Gressitt; 2 ♀♀, Busu R. Forest, Lae area, 17. VI. 1965, R. W. Crosskey. BISMARCK ARCH.: 1 ♂, Lorengau, Manus, 21. VI. 1962.

DISCUSSION. The 5 specimens listed above, plus 2 ♀♀ from Ulu Langat, Selangor, Malaya, 300-390 m (BISHOP) which I tentatively assign to *cincta*, differ in most cases

from one another in a considerable number of characters and may represent more than 1 species. The ♂ from New Guinea has the palpus yellowish on about the apical half, the beret with about 10 hairs, the hind tibia with 2 or 3 anteroventrals, and the abdomen entirely yellow-orange. The ♂ from Manus I. has the palpus entirely black, the beret bare, the hind tibia with 1 anteroventral, and the abdomen entirely black. The 3 ♀♀ from New Guinea have the palpus black, the beret bare or, in 1 specimen, with a single hair on one side, the hind tibia with 1 anteroventral, and the abdomen entirely yellow-orange. The description of the ♀ terminalia and egg above are based upon one of these specimens. The 2 ♀♀ from Malaya have the beret with several hairs and the abdomen black with about the apical half of tergite 5 reddish.

The abdomen of 1 ♀ from Malaya was macerated; it contained 1 egg. Both the terminalia and the egg differed rather markedly from the those of the 1 ♀ from New Guinea examined as follows: Anterolateral portions of tergite 8 larger, subrectangular instead of subtriangular; lateral seta of tergite 8 and apical seta of sternite 8 much weaker; epiproct about 2/3 as long as broad instead of 3/5 as long as broad. Egg with anterior filaments broad, not tapering, curved ventrad at 2/3 their length and bluntly rounded apically, about 1/7 as long as body of egg; anteromedian process distinct, triangular, extending almost to apex of filaments; margins of filaments and anteromedian process with short blunt papillae (anteromedian process and anterior filaments broken off in single egg from ♀ from New Guinea but the remnants suggest they were not quite as described above); micropyle at about 1/5 length of body of egg. In a second ♀ from New Guinea and the second Malaya ♀ in which the terminalia were sufficiently exposed for the lateral seta of tergite 8 and the apical seta of sternite 3 to be visible, these setae were of approximately the same strength as in the ♀♀ from the same regions whose terminalia are described above.

The variation in color of palpus and abdomen, in hairing of the beret, and in bristling of the hind tibia occur in so many combinations that it is not at present possible to decide whether more than 1 species is represented or whether morphologically separable populations of 1 species occur in different areas. The differences in the ♀ terminalia and in the position of the micropyle of the egg between the New Guinea and Malayan specimens are greater than I have observed within any other species.

Myospila cincta is the only species of the genus known to me in which the pteropleuron bears a few hairs.

Myospila propinqua (Stein), n. comb. Fig. 112, 113, 123.

Spilogaster propinqua Stein, 1900, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **20:** 386.

Mydaea propinqua, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 180.

Helina propinqua, Pont, 1966, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **76:** 100.

Medium-sized robust dark species with obscurely striped thorax, spotted abdomen and mostly dark femora. Length 5.2 to 6.3 mm.

♂. Head black; parafrontal and parafacial greyish-white pollinose; face, cheeks and occiput grey pollinose. Front at narrowest point about 1-1/2 × as wide as ocellar triangle; frontal vitta distinct throughout, at narrowest point about as wide as parafrontal. Orbital bristles on entire length of front,

those of lower 5 or 6 pairs strong, irregularly spaced, decreasing only slightly in length caudad and extending over about 2/3 length of front, those of last 2 to 3 pairs very weak and hair-like, proclinate and increasing slightly in length caudad, those of last pair more or less opposite anterior margin of anterior ocellus. Antenna dark brown to black, dorsal apex of segment 2 and extreme base of outer surface of 3 obscurely yellowish. Palpus black, scarcely broadened.

Thorax black; mesonotum and disc of scutellum rather densely blue-grey pollinose, former with a pair of narrow brownish stripes just mediad of dorsocentral rows which end about halfway from suture to scutellum and with poorly defined brownish stripe laterad of dorsocentrals and along supra-alars, disc of scutellum sometimes obscurely reddish laterally. Dorsocentrals arranged 2 + 3, strong, a fourth postsutural sometimes represented by a short very weak hair-like bristle; anterior intraalar absent; prealar very short or indistinguishable. Posterior spiracle moderately large, about 3/4 as long as beret. Prosternum, metasternum and sternite 1 bare. Wing very slightly brownish throughout. Vein R_{4+5} bare above, below with 2 to 5 weak setae on about basal 1/8 of first section. Apex of vein M_{1+2} very nearly straight, curved only nearly imperceptibly forward. Posterior crossvein slightly to rather strongly curved or moderately sinuate. Squamae and haltere pale yellow. Legs with coxae and most of femora dark brown to black, trochanters and narrow femoral apices yellow-brown, tibiae and tarsi dull yellow, latter slightly brownish towards apex. Mid femur with weak anteroventrals of which only 2 or 3 near base are slightly longer and stronger, with 4 or 5 moderately strong posteroventrals on basal 1/3. Hind femur with 2 weak anteroventrals on basal half and 6 or 7 of increasing length on apical half, with 2 moderately strong posteroventrals near base. Mid tibia with 2 posterior bristles. Hind tibia with 1 anterodorsal, 1 or 2 anteroventrals.

Abdomen black, densely olive-grey pollinose dorsally; tergite 2 with approximately median third dark brown; tergites 3 and 4 each with a submedian pair of anteriorly narrowed brown spots on posterior margin, the spots not quite as long as the tergite; tergite 5 with a pair of small obscure submedian brownish spots. Terminalia (Fig. 112, 113): Cerci fused on upper 2/3 of approximated portion. Cercus slightly narrowed toward apex, transversely truncate. Surstylus nearly parallel-sided. Postgonite scarcely thickened, curved abruptly ventrad at 2/3 its length. Aedeagal spine rather narrow, nearly parallel-sided, truncate apically.

♀. Very similar to ♂, differing as follows: Palpus distinctly broadened, broadest at about 2/3 its length. Submedian dark stripes of mesonotum becoming slightly broader posteriorly and continuing to scutellum; anterior intraalar weak but distinct. Vein R_{4+5} setose below on up to basal 1/3 of first section. Apex of vein M_{1+2} curved very slightly but distinctly forward. Tergite 5 without distinguishable brown spots. Terminalia (Fig. 123): Tergite 7 broader than long, anterior emargination moderately deep, anterior processes broadly subtriangular, with slender anterolateral as well as posterolateral process so lateral margin appears very broadly emarginate. Sternite 7 narrowly suboval, about 5 × as long as broad, with 2 rather strong apical setae. Tergite 8 with anterolateral portions rather broad, subrectangular, each portion with posteromedian projection almost reaching median line, each very narrowly joined to posterior portion, latter with lateral setae only slightly stronger than others. Halves of sternite 8 with 4 rather short strong setae. Epiproct half as long as broad. Cercus about $2\text{-}^1/_2$ × as long as broad, tapering slightly from midlength to rounded apex. Hypoproct moderately deep anteriorly, scarcely curved upward posteriorly.

DISTRIBUTION. Amboina, New Guinea (up to 160 m), Solomon Is.

Type locality and type. Amboina. Holotype ♂ in MCSNG (Pont, 1966b). Pont referred the species to *Helina (Helinella), sensu* van Emden (1965). Only 1 regional species falls within that concept as defined by van Emden, and a ♂ of that species from Amboina agrees with Stein's original description of *propinqua.*

Specimens Examined (Bishop, BMNH, CNC, AMS). INDONESIA: 1 ♂, Amboina, F. Muir. NE NEW GUINEA: 1 ♂, Maprik area, Sepik, 160 m, 23. VIII. 1957, D.E. Hardy. SE NEW GUINEA: 4 ♂♂, 2 ♀♀, Aroana Estate, Aroa R., 7. XII. 1963, D.K. McAlpine; 2 ♂♂, 1 ♀, Laloki, XI. 1910, F. Muir. SOLOMON IS.: 1 ♂, Tambalia, 30 km W of Honiara, Guadalcanal, 27. V. 1964, J. Sedlacek; 1 ♀, Kukum, Guadalcanal, 15 m, 5. X. 1957, on human excrement, J. L. Gressitt; 1 ♂, Kieta, Bougainville I., 27. XI. 1959, T.C. Maa; 1 ♂, Pepele, Kolombangara, 30 m, 7. II. 1964, P. Shanahan; 1 ♂, Gizo I., New Georgia Group, 50-120 m, 16-26. IV. 1964, Sedlacek; 1 ♀, Munda, New Georgia I., 1-30 m, 15. VIII. 1959, Gressitt; 1 ♀, NE end of Rendova I., New Georgia Group, 16. VIII. 1959, Gressitt.

Discussion. *Spilogaster propinqua* Stein was synonymized by van Emden (1965) with *Anthomyia lenticeps* Thomson, 1869, and he used the name *Helina lenticeps* (Thomson) for a species which he said was widespread in SE Asia (including Taiwan, Philippines, and Ceylon) and in the Ethiopian Region, and which he recorded also from Amboina. The latter record was almost certainly based on Stein's type of *propinqua*. I have examined 12 ♂♂, 11 ♀♀ from Ceylon, 2 ♂♂ from S India and 1 ♂ from Nepal (CNC) which are undoubtedly *lenticeps* and think it probable that the specimens listed above as *propinqua* represent a species distinct from *lenticeps*. In the ♂♂ of *propinqua* the frontal vitta is distinct throughout and never narrower than the parafrontal at the same level (as was stated by Stein for the type of *propinqua*), whereas in the ♂♂ of *lenticeps* the frontal vitta is completely obliterated on about the median third of the front (as described by van Emden for *lenticeps*). Both sexes of *propinqua* have the antennal segment 3 (except the extreme base), the humeri, the femora except their apices, and the base of the abdomen dark, whereas in both sexes of *lenticeps* these areas (except often the fore femora) are usually pale. The ♂ of *lenticeps* from Nepal, however, has all femora mostly blackish. In addition, the brownish spots on tergites 3 to 5 are much larger in *propinqua* than in *lenticeps*. The terminalia of both sexes show no significant differences in the 2 species. Neither form has been recorded from North Borneo nor from the whole of Indonesia west of Amboina; material from this region, if one or both forms do in fact occur there, might indicate definitely whether or not the 2 forms recognized above should be considered conspecific.

Previous records of *propinqua* from within the known range of *lenticeps* (Malloch, 1926; van Emden, 1951) were probably all based on specimens of the latter species. If they should be definitely established to be distinct species, the genus *Helinella* Malloch, 1926 might have been based on a misidentified type-species and the case should be submitted to the International Commission. On the other hand, as long as all the forms involved are referred to the genus *Myospila*, as they are here, the establishment of the type-species of *Helinella* Malloch is of no practical importance.

A species considered by van Emden (1965) to be consubgeneric with *lenticeps*, *Mydaea fuscisquama* Stein, 1910, is described as having densely haired eyes, 4 postsutural dorsocentral bristles, and vein M_{1+2} very slightly curved backward at tip. The last character, in conjunction with the presence of setae on the underside only of vein R_{4+5}, suggests that the species very probably belongs to the genus *Helina*.

Myospila argentata (Walker), n. comb. Fig. 96, 97, 114, 115, 133.

Aricia argentata Walker, 1857, *J. Proc. Linn. Soc.* **1:** 27.

Spilogaster argentata, Stein, 1901, *Z. Syst. Hymenopt. Dipterol.* **1:** 187.

Mydaea argentata, Stein, 1915, *Supplta Ent.* **4:** 25; 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 185; van Emden, 1965, *Fauna India, Diptera* **7**(1): 490.

Eumydaea argentata, Karl, *Arb. Morphol. Taxon. Ent. Berl.* **2:** 41.

Eumyiospila argentata, Pont, 1968, *Ent. Meddr* **36:** 174.

Aricia integra Walker, 1860, *J. Proc. Linn. Soc.* **4:** 140.

Spilogaster integra, Stein, 1901, *Z. Syst. Hymenopt. Dipterol.* **1:** 199.

Aricia nigricosta Walker, 1860, *J. Proc. Linn. Soc.* **4:** 140.

Spilogaster bilineata Stein, 1900, *Természetr. Füz.* **23:** 137.

Mydaea bilineata, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 185.

Eumyiospila bilineata, Pont, 1969, *Dt. Ent. Z.*, N.F. **16:** 82.

Spilogaster pellucida Stein, 1900, *Annali Mus. Civ. Stor. Nat. Giacomo Doria* **40:** 8. **N. Syn.**

Mydaea pellucida, Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* 16: 183; Hennig, 1952, *Beitr. Ent.* **2:** 76 (in error as *pellucida* Walker); van Emden, 1965, *Fauna India, Diptera* **7**(1): 488.

Eumyiospila pellucida, Malloch, 1928, *Ent. Mitt.* **17:** 314; Pont, 1966, *Annali Mus. Civ. Stor. Nat Giacomo Doria* **76:** 100.

Mydaea attenta Stein, 1918, *Ann. Hist.-Nat. Mus. Natn. Hung.* **16:** 167. **N. syn.**

Eumydaea attenta, Karl, 1935, *Arb. Morphol. Taxon. Ent. Berl.* **2:** 41.

Eumyiospila spinifemorata Malloch, 1926, *Philipp. J. Sci.* **31:** 499.

Medium to large robust species with dark or reddish thorax and with abdomen yellowish basally or entirely dark. Length 6.3 to 9.2 mm.

♂. Head black; parafrontal, parafacial and face densely silvery pollinose; cheek and occiput slightly grey pollinose. Front at narrowest point about 1-$^1/_2$ × as wide as ocellar triangle, frontal vitta obliterated on about 1/3 frontal length. Orbital bristes in about 5 to 6 very irregular pairs on about lower 4/5 of front, lowest pair only moderately strong, others decreasing rapidly in size caudad so the last reclinate pair is very short and weak; a short weak proclinate pair just below level of anterior ocellus. Antenna with segment 1 and segment 2 except apex dark brown, apex of segment 2 dull yellow, segment 3 entirely dark yellow to yellow or with only extreme base yellowish and remainder dark brown to black. Palpus black, very slightly broadened on apical half.

Thorax black, margins of scutellum and often humerus, notopleural area and anterodorsal portions of pleura dull reddish to dull yellowish; mesonotum and disc of scutellum densely grey pollinose, former with a pair of blackish stripes just mediad of dorsocentrals which broaden posteriorly and are more or less confluent in prescutellar area, usually with indistinct brownish areas in front of scutellum and presuturally and postsuturally laterad of dark stripes, and with an irregular blackish sublateral stripe extending from presutural bristle across supraalars and onto postcallus and anterolateral angles of scutellum; pleura slightly and irregularly grey pollinose. Dorsocentrals arranged 2 + 4, the first 2 postsuturals much shorter than the third but quite strong and distinct; anterior intraalar absent; prealar moderately strong, about half as long as posterior notopleural. Sternopleurals arranged 2 + 2, lower anterior one short and very weak. Posterior spiracle moderately large, about 2/3 as long as beret. Prosternum, metasternum and sternite 1 bare. Wing slightly yellowish basally. Vein R_{4+5} with setae above and below at base extending at most 1/5 of distance to anterior crossvein, none of these setae noticeably elongate. Vein M_{1+2} with apex curved barely perceptibly forward.

Posterior crossvein slightly curved to rather strongly sinuate. Legs usually bright yellow with coxae and trochanters brown to black and tarsi black, rarely mostly black with broad femoral apices and fore and mid tibiae yellow to yellow-orange, and hind tibiae yellow to yellow-brown only on about basal half. Fore femur usually with 1 or 2 short, strong, rather spine-like anteroventrals at about 4/5 its length. Mid femur with anteroventrals on basal half rather short and weak, with those on apical half sometimes short and weak, more often forming a comb of about 12 short, stout, slightly curved, spine-like bristles (Fig. 96); 3 or 4 moderately long posteroventrals present on basal half those on apical half usually short and hair-like but occasionally forming a comb similar to, but much weaker than, that on the anteroventral surface. Hind femur with very short weak anteroventrals on basal 3/5, with a series of 6 to 7 short, moderately to very strong, slightly curved, spine-like anteroventrals on apical 2/5, similar to those of mid femur but longer, stronger and more widely spaced (Fig. 97); 1 to 3 weak posteroventrals present on basal half of femur. Mid tibia with 2 posterior bristles; hind tibia with 1 anterodorsal, 1 anteroventral.

Abdomen black, tergite 2 usually dull yellow laterally and sometimes throughout, tergite 3 usually dull yellow at least anterolaterally and sometimes entirely yellow except for a dark median line, tergites 4 and 5 rarely dull yellow laterally, latter usually narrowly reddish-yellow apically. Abdomen densely pale grey pollinose, tergites 3 and 4 each with a pair of large submedian rounded posterior spots lacking pollen and appearing black on a pale grey and dull yellow background. Terminalia (Fig. 114, 115): Cerci fused on upper 3/5 of approximated portion, slightly swollen near line of fusion. Cercus slightly narrowed toward obscurely emarginate apex. Surstylus with slight anterior swelling on basal half, not broadened on apical half. Postgonite curved abruptly ventrad at 3/4 its length. Aedeagal spine not very broad, broadest at 3/4 its length, truncate apically.

♀. Similar to ♂ but usually paler in color, differing as follows: Palpus strongly broadened over most of its length. Thorax dark, with only humerus and scutellar margins reddish, or with pale color greatly extended so that in extreme cases, only disc of mesonotum postsuturally blackish and rest of thorax dull yellow to reddish yellow. Lower anterior sternopleural sometimes indistinguishable. Posterior spiracle about half as long as beret. Apex of vein M_{1+2} curved slightly more strongly forward. Legs entirely yellow except for brownish coxae and black tarsi, or extensively darkened with basal half or more of femora as well as coxae and trochanters dark brown to black. Fore femur without anteroventrals near apex. Mid and hind femora with bristles on basal half as in ♂, those on apical half normal, not forming combs nor spine-like. Mid femur with anteroventrals on apical half numerous but short and rather weak. Hind femur with anteroventrals on apical half increasing in length, last 2 or 3 shortly before apex long and strong. Abdomen variable in color, sometimes entirely dark or with only tergite 5 slightly reddish apically, frequently extensively yellow-brown as in ♂, grey pollen much darker but tergites 3 and 4 always with a pair of large dark brown to black submedian non-pollinose spots. Terminalia not distinguishable from those of *propinqua* (Fig. 123).

Egg (Fig. 133). Anterior filaments and anteromedian process about 1/12 as long as body of egg, their margins with short truncate papillae. Outer surface of filament and dorsal surface of median process with scale-like reticulation; inner surface of flange and dorsal surface of egg between flanges with distinct hexagonal reticulation which is less well defined on inner surface of anterior filament; outer surface of flange with fine obscure irregular reticulation; rest of surface of egg with faint but well-defined hexagonal reticulation. Micropyle at 1/7 length of underside of egg. Five abdomens with eggs examined; range in number of eggs 6 to 58.

DISTRIBUTION. New Guinea (0-1800 m), Bismarck Arch. (0-1000 m), Solomon Is. (0-80 m), Amboina, also widespread and abundant north and west to Taiwan, N Burma, India (Calcutta) and Ceylon.

Type localities and types. Aricia argentata Walker: Malacca. Type ♂ in BMNH (van Emden, 1965).

Aricia integra Walker: Makassar, Celebes. Type ♂ in BMNH (van Emden, 1965).

Aricia nigricosta Walker: Makassar, Celebes. Types, ♂ and ♀, in BMNH (van Emden, 1965).

Spilogaster bilineata Stein: Friedrich Wilhelmshaven (= Madang), New Guinea. Lectotype ♀ in Zool. Mus., Berlin (Pont, 1966b).

Spilogaster pellucida Stein: Ternate. Lectotype ♂ in MCSNG (Pont, 1966b).

Mydaea attenta Stein: Calcutta, India. Holotype ♂ presumably in Zool. Surv. India, Calcutta.

Eumyiospila spinifemorata Malloch: Mt Maquiling, Luzon, Philippines. Type ♂ presumably in USNM.

I have examined a ♂ from New Guinea compared by Pont with the type ♂ of *argentata,* and another ♂ from New Guinea compared by Pont with the lectotype ♀ of *bilineata;* I consider these 2 specimens conspecific. *Spilogaster bilineata* was already synonymized with *argentata* by Stein (1915, p. 25). *Aricia integra* and *nigricosta* were synonymized by Stein (1901), who had examined the types of all 3 nominal species; van Emden (1965), who also examined the types, agreed with Stein. Van Emden (1965) synonymized *attenta* with *pellucida* and *spinifemorata* with *argentata* on the basis of the original descriptions; I accept this synonymy. Pont has sent me a detailed description of the lectotype ♂ of *pellucida;* the ♂ from Hollandia-Binnen, NW New Guinea, agrees well with this description except that the anteroventral bristles of the hind femur are apparently rather weaker in the type. As indicated below (and by van Emden (1965)), specimens from Ceylon have these bristles very variable, and van Emden (p. 492) has already suggested that *argentata* and *pellucida* are probably conspecific.

Specimens Examined (Bishop, BMNH, CNC, AMS, UZMC). INDONESIA: 2 ♂♂, Amboina, XI. 1908, F. Muir. NW NEW GUINEA: 1 ♂, Hollandia-Binnen, 100 m, 1. XI. 1958, J. L. Gressitt; 1 ♂, Lake Sentani, Ifar, VIII. 1936, L. E. Cheesman; 3 ♀♀, W Sentani, Cyclops Mts, Hollandia area, 150-250 m, 17, 19. VI. 1959 (1 ex fresh human excrement), Gressitt. NE NEW GUINEA: 2 ♂♂, Goroka, E Highlands, 1530-1650 m, 25-29. V. 1965, R. W. Crosskey; 1 ♂, Mt Hagen, 4-7. VI. 1965, Crosskey; 1 ♂, Wau, 1067-1220 m, 14-23. V. 1965, Crosskey; 2 ♀♀, Wau, 1200 m, 11-15. X. 1961 and 9. IV. 1963, J. Sedlacek; 1 ♀, Karimui, 1080 m, 13. VII. 1963, M. Sedlacek; 1 ♀, Ahl Val., Nondugl, 1750 m, 8. VII. 1955, Gressitt; 2 ♀♀, Okapa, 64 km S of Kainantu, 1800 m, 29. IX. 1959, T. C. Maa. SE NEW GUINEA: 1 ♀, Brown R., 30. VIII. 1959, Maa; 1 ♀, Port Moresby, 6. X. 1963, D. K. McAlpine; 1 ♀, Gaile Forest, 28 mi. SE of Port Moresby, 8. V. 1965, Crosskey; 1 ♀, Kulumadau Hill, Woodlark I. (Murua), 16. III. 1959, W. W. Brandt. BISMARCK ARCH.: 1 ♀, Lorengau, Manus I., 1-75 m, 28. VI. 1959, Gressitt; 1 ♀, same locality, 21. VI. 1962; 2 ♂♂, Keravat, New Britain, 23. VI-5. VII. 1965, Crosskey; 1 ♀, Gaulim, Gazelle Penin., New Britain, 130 m, 20. X. 1962, J. Sedlacek; 1 ♀, Yalom, New Britain, 1000 m, 10. V. 1962; 1 ♀, Lemkamin, New Ireland,

7. IV. 1962; 2 ♀♀, Kalili Bay, Danu, New Ireland, 30. V. 1962. SOLOMON IS.: 1 ♂, 2 ♀♀, Visale, Guadalcanal, 10, 19. XII. 1955; 4 ♀♀, Arawa, 4-7 mi. N of Kieta, Bougainville I., 9-13. VII. 1965, Crosskey; 3 ♀♀, Pepele, Kolombangara, 30 m., 7. II. 1964, P. Shanahan; 2 ♀♀, Ulo Crater, Vella Lavella, 10 m, 21. XII. 1963, Shanahan; 1 ♀, Kundurumbangara, Vella Lavella, 80 m, 15. XI. 1963, Shanahan; 1 ♀, Gairava, Florida Group, 14. IX. 1960, C. W. O'Brien.

Discussion. This species varies markedly in color. The color to a considerable extent is correlated with distribution, but a few specimens do not fit these patterns and indicate that subspecies cannot be defined on the basis of color characters.

The 1 ♂ and 13 ♀♀ from the Solomon Islands, 2 ♀♀ from Manus I. and 1 ♀ from Ahl Val., Nondugl, NE New Guinea, are very dark, with the antennal segment 3 dark brown to black with only the extreme base yellowish, the thorax black with only the humerus and the scutellar margins reddish, the femora broadly black on basal half or more, and the abdomen entirely dark except sometimes at apex. The remaining ♂♂, from New Britain, New Guinea, and Amboina, have the antennal segment 3 yellow or slightly brownish, the thorax a little more extensively yellow, the femora entirely yellow and the abdomen extensively yellowish basally. The 2 ♂♂ from New Britain have the antennal segment 3 brownish; those from New Guinea have it either brownish or pale yellow.

The ♀♀ from New Guinea resemble these ♂♂, with the antennal segment 3 bright yellow in all but 1 of the specimens where it is brownish, the thorax and abdomen often extensively reddish or yellowish, and the femora entirely yellow.

Finally, 3 ♀♀ from New Ireland and 2 from New Britain are moderately dark, with the antennal segment 3 mostly brown to dark brown, the thorax dark except for the humerus and scutellar margins, the femora entirely yellow, and the abdomen reddish only at the apex.

I have examined also 10 ♂♂ and 30 ♀♀ from Ceylon and S India (CNC), of the form treated by van Emden (1965) as *Mydaea* (*Eumyiospila*) *argentata* (Walker). They resemble most closely the New Guinea form, and are almost certainly conspecific with them, but have the antennal segment 3 almost entirely dark brown to black, the thorax dark except for the reddish humerus and scutellum, the pollen of the tergites yellowish-grey or brownish-grey instead of pale grey, and the dark spots of the tergites much smaller, especially in the ♀. Like the New Guinea specimens, they have the femora entirely yellow and the abdomen at least obscurely yellowish basally.

The only marked variation in all these specimens other than in the color is in the spine-like bristles of the femora of the ♂. All the specimens but 3 have at least a trace of these on the fore femur and a complete series on about the apical 2/5 of the mid and hind femora, but they vary considerably in number, length and strength. Two of these 3 specimens, 1 from Hollandia-Binnen, NW New Guinea, and 1 from Ceylon, have no spines on the fore and mid femora and only 4 or 5 very weak ones on the hind femur. The third ♂, from Ceylon, has no distinct spines on any of the femora -- the hind femur has only 2 or 3 short and 1 or 2 longer weak anteroventral

bristles. One ♀ from Ceylon in the CNC has the dorsoventral bristles exactly as described by van Emden for *pellucida;* all the other specimens from Ceylon, India, and the New Guinea area which I have examined have 4 distinct postsutural dorsocentrals. Van Emden (1965, p. 472) mentions specimens from Ceylon which are intermediate between typical *pellucida* and typical *argentata* in the position and strength of the dorsoventrals. In view of the considerable variation in color and in bristling of the ♂ femora shown by the material available to me, I agree with van Emden that *argentata* and *pellucida* are probably not distinct species.

I have compared the terminalia of ♂♂ from New Guinea and Ceylon, and of ♀♀ from Solomon Is., New Guinea, Ceylon (including ♀♀ with both types of dorsocentral bristling) and India and find no apparent differences between specimens from different areas. The eggs from ♀♀ from Solomon Is., New Guinea, and Ceylon also show no distinct differences.

M. argentata is apparently closely related to *propinqua* (Stein) and to *lenticeps* (Thomson). The ovipositors of the 3 species are apparently identical, and an egg from the abdomen of a ♀ of *lenticeps* from Ceylon is very similar to that of *argentata* but has the anterior filaments and median process only half as long. However, despite the marked variation in color in *argentata,* this species is readily distinguished from the other 2 by the presence of setulae on the dorsal surface of the node of R_5, by the black instead of yellow tarsi and by the presence (with rare exceptions) of 4 strong postsutural dorsocentrals and, in the ♂, of short spine-like anteroventral preapical femoral bristles.

Pont (1968a) referred an additional species, *Myospila flavicans* Malloch, 1921, to *Eumyiospila.* I have seen 1 ♀ of *flavicans* from Queensland; in structure (including the terminalia and egg) it agrees well with *argentata,* but it is entirely yellow to reddish-yellow in color and probably represents a distinct species.

Myospila aureorufa Vockeroth, new species Fig. 98, 116, 117.

Medium-sized to large, rather slender, reddish-yellow species with mesonotum sometimes blackish and with abdomen golden pollinose. Length 5.2 to 8.5 mm.

♂. Head (Fig. 98) black; parafrontal, parafacial and face densely silvery pollinose; cheek and occiput rather heavily grey pollinose. Front at narrowest point as wide as ocellar triangle; frontal vitta obliterated on about middle 1/3 of frontal length. Orbital bristles in 3 to 5 rather regular pairs on lower 1/2 to 2/3 of front, uniform in length or decreasing caudad, sometimes followed by or interspersed with a few very short hairs; a pair of very short weak proclinate bristles situated slightly below level of anterior ocellus. Antenna with first 2 segments yellow, third whitish-yellow. Palpus yellow-brown to dark brown, only very slightly broadened.

Thorax reddish-yellow, disc of mesonotum often black or brownish-black as far laterad as presutural and posterior intraalar bristles, area between the dorsocentrals in front of suture sometimes reddish or partly reddish; mesonotum with moderately dense greyish-white pollen which is distinct only on darker specimens; pleura very lightly grey pollinose. Dorsocentrals arranged 2 + 3, strong, very rarely with a barely perceptible bristle in front of first postsutural; anterior intraalar and prealar very short and weak or indistinguishable. Posterior spiracle small, about half as long as beret. Prosternum, metasternum and sternite 1 bare. Wing strongly yellow to yellow-brown, slightly paler

posteriorly. Vein R_{4+5} with 5 to 11 setae above and below, the setae more or less uniform in length and extending from 1/4 to 1/2 distance to anterior crossvein. Apex of M_{1+2} curved very slightly but distinctly forward. Posterior crossvein slightly and irregularly curved or nearly straight. Squamae and haltere dark yellow. Legs bright yellow, hind tibia yellow brown to brown, fore and mid tarsi slightly brownish towards apex, hind tarsus dark brown. Mid femur with 4 or 5 weak to very weak anteroventrals and 3 or 4 moderately strong posteroventrals near base. Hind femur with 3 or 4 rather strong anteroventrals and 2 or 3 slightly weaker posteroventrals near apex. Mid tibia with 2 posterior bristles. Hind tibia with 1 anterodorsal, 1 posterodorsal.

Abdomen reddish-yellow, sometimes obscurely brownish on disc and towards apex; tergites 2 to 5 laterally with dense golden pollen, pollinose areas on tergites 2 to 4 broad anteriorly, narrowed toward posterior margin of tergite and then slightly broadened at posterior margin, tergites 3 and 4 sometimes with very narrow median stripe of golden pollen. Terminalia (Fig. 117): Very similar to those of *propinqua* but cerci a little longer, surstylus a little more slender, and aedeagal spine slightly broadened to midlength and then slightly narrowed to rounded apex.

♀. Similar to ♂, differing as follows: Palpus dark brown to black, rather strongly broadened. Thorax entirely reddish-yellow or at most with mesonotum slightly brownish in front of scutellum, very weakly pollinose. Vein R_{4+5} with ventral setae often extending to or well beyond anterior crossvein. Hind femur without distinct posteroventrals near apex. Abdomen usually entirely reddish-yellow, rarely extensively brown to dark brown above but at least with tergite 1, base of tergite 2 and extreme apex of tergite 5 reddish. Abdomen shining to subshining, with only very faint yellowish pollen. Terminalia as in *propinqua* (Fig. 123).

DISTRIBUTION. Solomon Is., 0-1200 m.

Types. Holotype ♂ (BISHOP 9609), Kokure, Bougainville I., 690 m. 10. VI. 1956, E. J. Ford Jr. Paratypes (BISHOP, BMNH, CNC, AMS, UZMC): 2 ♂♂, same data as holotype but 12 and 14. VI; 2 ♀♀, Arawa, 4-7 mi. N of Kieta, Bougainville I., 9-13. VII. 1965, R. W. Crosskey; 1 ♀, Gagan, Buka, 8-11. XII. 1959, T.C. Maa; 1 ♀, Buka Agricultural Station, Buka, 6-10. XII. 1959, Maa; 3 ♂♂, 1 ♀, nr Tetere, Roroni, Guadalcanal, 11, 24. V. 1960, C. W. O'Brien; 1 ♂, Suta, Guadalcanal, 800-1200 m, 27. VI. 1956, J. L. Gressitt; 1 ♀, Tambalia, 30 km W Honiara, Guadalcanal, 24. V. 1964, R. Straatman; 1 ♀, Guadalcanal, 17. I. 1921; 1 ♂, 1 ♀, Tangtalau-Kwalo, Malaita, 200-350 m, 24, 30. VI. 1957, Gressitt; 1 ♂, Auki-Tangtalau, Malaita, 25-200 m, 23. IX. 1957, Gressitt; 3 ♂♂, Molao, Santa Isabel, 29, 30. VI. 1960, O'Brien; 1 ♂, Mt Arewana, Vella Lavella, 100-400 m, 16. XI. 1963, L. & M. Gressitt; 1 ♀, Ulo Crater, Vella Lavella, 10 m, 21. XII. 1963, P. Shanahan; 1 ♂, Wugiroga, San Cristoval, 8. VIII. 1960, O'Brien; 1 ♀, Kira Kira, San Cristoval, 28. VII. 1960, light trap, O'Brien; 2♀♀, Kira Kira, 0-50 m, 10. XI. 1964, R. Straatman; 1 ♀ Pepele, Kolombangara, 30 m, 7. II. 1964, Shanahan; 1 ♀, Kolombangara, mountain slope from 10-300 m, 9. VII. 1959, Gressitt; 1 ♀, Munda, New Georgia I., 1-30 m, 20. VII. 1959, Gressitt; 1 ♀, same locality, 15. VII. 1959, on fresh human excrement, Gressitt.

DISCUSSION. This species from the Solomon Is., and the forms described below as *fumidala* n. sp. from New Britain and *novaehebudae* n. sp. from New Hebrides, should perhaps all be considered conspecific. The similarities and differences are discussed below under *fumidala*. The 2 species *Myospila semidiaphana* (Stein), 1918, and *M. dubia* (Stein), 1918, both from Ceram, are apparently also members of the same complex and are also discussed under *fumidala*.

Myospila fumidala Vockeroth, new species Fig. 130, 131.

Medium-sized, dark-bodied, rather slender species with distinctly striped thorax, black-spotted red-tipped abdomen, and in ♀, strongly darkened wings. Length 7.4 to 7.8 mm.

♂. Head color as in *aureorufa*. Front at narrowest point slightly wider than or about $1\text{-}^1/_2 \times$ as wide as ocellar triangle; frontal vitta at narrowest point linear and almost obliterated or about as wide as anterior ocellus. Orbital bristles in 3 pairs, strong, decreasing only very slightly in length posteriorly, restricted to lower half of frons, followed by 1 or 2 minute hairs and, in holotype, by a pair of very weak hair-like proclinate orbitals at level of anterior ocellus. Antenna with first 2 segments yellow, third whitish-yellow. Palpus black, very slightly broadened.

Thorax black; mesonotum and disc of scutellum densely pale grey pollinose, former with broad dark brown pollinose median stripe which fills most of space between dorsocentral rows and ends a short distance in front of scutellum and with broad black lateral postsutural stripes; pleura lightly grey pollinose. Thoracic bristles and hairs as in *aureorufa*; anterior intraalar weak but distinct. Wing slightly yellowish with posterior portion paler or with approximately basal 1/3 pale yellowish and apical 2/3 distinctly and almost uniformly pale brown. Vein R_{4+5} with 3 to 5 setae above near base, with 6 to 10 setae below on basal half or even on entire length of first section. Vein M_{1+2} curved very slightly but distinctly forward at apex. Posterior crossvein nearly straight or slightly but distinctly curved. Squamae and haltere pale yellow. Legs bright yellow, fore coxa pale brown, mid and hind coxae dark brown, hind tibia slightly brownish, tarsi slightly darkened towards apex. Mid femur with 5 or 6 weak anteroventrals and 3 or 4 strong posteroventrals on basal third, longest of the latter fully as long as femoral diameter. Hind femur with an entire row of anteroventrals, those on basal half widely spaced but longest one almost as strong as strongest preapical anteroventral, with 3 short weak posteroventrals on basal half. Mid tibia with 2 posterior bristles. Hind tibia with 1 anterodorsal, 1 anteroventral.

Abdomen black, tergites densely pale grey pollinose dorsolaterally so that tergite 2 appears grey with the median half black, and each of tergites 3 and 4 appears pale grey with a large median black spot which is slightly narrower anteriorly than posteriorly and has the lateral margins rounded; tergite 5 mostly reddish, densely greyish pollinose anteriorly, more weakly pollinose posteriorly, with lateral margins and obscure anteromedian stripe blackish-brown. Terminalia as in *aureorufa* (Fig. 117).

♀. Similar to ♂ but with strongly darkened wings, differing as follows: Palpus distinctly broadened. Thorax with humeral area sometimes dull yellowish; mesonotum with dark median stripe continuing to scutellum and narrowly divided by a brown pollinose stripe which becomes broader as it approaches scutellum. Wing with basal third strongly yellowish, apical 2/3 quite dark brown, becoming only very slightly paler posteriorly and towards apex. Setae on ventral surface of vein R_{4+5} extending only halfway to anterior crossvein. Abdomen apparently less densely grey pollinose dorsolaterally, black median spots present but less distinct, extreme apex of tergite 4 and all of dorsal surface of tergite 5 red-orange and only moderately pollinose. Terminalia as in *propinqua* (Fig. 123).

Egg (Fig. 130, 131). Anterior filaments and anteromedian process about 1/12 as long as body of egg, their margins with short truncate papillae. Outer surface of flange, anterior 1/3 of inner surface of flange and dorsal surface of anteromedian process with scale-like reticulation; rest of inner surface of flange with very obscure irregular reticulation; dorsal surface of egg between flanges with coarse distinct hexagonal reticulation on each lateral 1/5 (adjacent to base of flange), without discernible reticulation on median 3/5; rest of egg surface with faint hexagonal reticulation. One abdomen with 3 eggs examined.

DISTRIBUTION. New Britain.

Types. Holotype ♂ (BMNH), Keravat, New Britain, 25-30. VI. 1965, R. W. Crosskey. Paratypes (BMNH, UZMC): 1 ♂, same data as holotype; 1 ♂, 1 ♀, Yalom, New Britain, 1000m, 16, 21. V. 1962; 1 ♀, Kongi, New Britain, 1000 m, 14. V. 1962.

DISCUSSION. Despite the marked difference in color this species seems to be closely related to *aureorufa* n. sp. Apart from the slightly broader ♂ front, which is narrower in the holotype of *fumidala* than in the paratopotype, the 2 species seem to differ structurally only in the distinctly stronger leg bristles of *fumidala.* The distribution of the dense dorsolateral pollen of the tergites is exactly the same in the 2 species and further suggests a close relationship. These 2 forms, from New Britain and the Solomon Is. respectively, and *novaehebudae* from the New Hebrides, should perhaps be considered conspecific.

The ♂ terminalia of the first 2 forms, and the ♀ terminalia of all 3, show no significant differences from one another. The ♀ terminalia also show no distinct differences from those of *argentata,* but *argentata* is sympatric with *aureorufa* and *fumidala,* and is undoubtedly distinct. The eggs of *argentata* and *fumidala* are also quite different from one another; that of *fumidala* is the only one known to me in the genus *Myospila* with the dorsal surface between the flanges with very strong and clear reticulation laterally and no distinguishable reticulation medially.

The 2 ♂♂ from Keravat have the wings only very slightly yellowish. The ♂ from Yalom has the wing slightly brownish on the outer 2/3; the 2 ♀♀ have the wing dark brown on the outer 2/3 and look very different from any other species of the genus. However, 1 of them bears exactly the same data as the ♂ from Yalom and I think it probable that all 5 specimens are conspecific.

I have examined 1 ♂ 1 ♀ from Lemkamin, New Ireland (UZMC) and 1 ♀ from Lelet Plateau, Schleinetz Mts, New Ireland (BISHOP) which may belong to *fumidala.* They have the wings only slightly yellowish. The ♂ has the anteroventrals and posteroventrals of the mid and hind femora much weaker, but in the ♀♀ they are as strong as in *fumidala.* The black median stripe of the mesonotum is undivided and extends to the scutellum in both sexes. The ♀♀ have tergite 5 dull reddish only on the apical 1/3 or less. The terminalia of the ♂ are identical with those of *fumidala.* All 3 specimens are in poor condition and it is necessary to wait until more material is available from both islands before a decision can be reached concerning the status of the New Ireland specimens.

I have examined the holotype ♂ of *Mydaea semidiaphana* Stein, 1918, and the holotype ♀ of *Mydaea dubia* Stein, 1918. Both species were described from Ceram and were referred by Pont (1968b) to *Eumyiospila.* They are here formally transferred to *Myospila,* as *Myospila semidiaphana* (Stein) (**n.comb.**) and *Myospila dubia* (Stein) (**n. comb.**). They both seem to be very closely related to the 3 species discussed above but probably represent distinct species.

The type of *M. semidiaphana* runs in the key above to couplet 14. It has the antenna, palpus and legs yellow, the mesonotum black except for a slightly yellowish

notopleural area, the scutellum black, the pleura mostly reddish-brown with some blackish and more densely pollinose areas, the abdomen dull yellow with a posterior median triangle on tergite 3, tergite 4 except short basolateral areas, and all of tergite 5 brown to blackish-brown, with moderately distinct greyish pollen only on tergite 5. The ocellar bristles are distinctly weaker and slightly shorter than the pair of strongest lower orbitals, and the uppermost pair of orbital hair (opposite the anterior ocellus) are moderately strong and about 3/4 as long as the ocellars. *M. aureorufa, fumidala,* and *novaehebudae* all differ from *semidiaphana* in many details of color. Also, all 3 species have the ocellar bristles as long and strong as strongest lower orbitals, and have the uppermost pair of orbital hairs very fine and at most 1/3 as long as the ocellar bristles.

The holotype ♀ of *M. dubia* runs in the key above to couplet 15. It is very similar to both *aureorufa* and *novaehebudae* and like the latter species, has the palpus yellow, but it differs from both species in having the mesonotum with a well-defined entire dark brown median stripe extending slightly laterad of the dorsocentrals, in having the hind tibia concolorous with the femur rather than distinctly darker, and in having tergite 4, but not tergite 3, with abundant rather coarse olivaceous pollen.

Myospila novaehebudae Vockeroth, new species

Medium-sized slender reddish-yellow species with abdomen usually darkened apically or preapically. Length 6.3 to 7.0 mm.

♂. Structurally almost indistinguishable from that of *aureorufa* n. sp., differing mainly in color as follows: Mouthparts missing. Thorax entirely reddish-yellow except for obscure brown prescutellar spot which extends from one dorsocentral row to the other and from second postsutural dorsocentral almost to scutellum; mesonotum without distinct pollen. Posteroventral bristles near base of mid femur and near apex of hind femur very weak. Mid tarsi and hind tarsi except one basitarsus missing. Abdomen yellow basally; tergite 3 with a broad posterior black triangle which reaches the anterior margin medially; tergite 4 black; tergite 5 black with narrow posterior margin obscurely reddish. Abdomen only very faintly grey pollinose above, without golden pollen. Terminalia not examined.

♀. Very similar to that of *aureorufa*, differing as follows: Palpus bright yellow. Thorax entirely reddish-yellow, very weakly pollinose. Abdomen reddish-yellow, shining, tergite 4 usually with large dark brown posterior triangle or entirely dark brown to black, base of tergite 5 and posteromedian portion of tergite 3 sometimes also dark brown. Terminalia as in *propinqua* (Fig. 123).

DISTRIBUTION. New Hebrides, 3-100 m.

Types. Holotype ♂ (BISHOP 9610), Limestone, Plateau N of Maat, Efate I., New Hebrides, 100 m, 18.VIII. 1957, J. L. Gressitt. Paratypes (BISHOP, BMNH, CNC, AMS): 1 ♀, same data as holotype; 5 ♀♀, Tasmulum, Espiritu Santo I., 3 m, 4.IX.1957, on fresh human excrement, Gressitt; 1 ♀, Narango, Espiritu Santo I., 90 m, VII. 1960, W. W. Brandt; 1 ♀, Hill E of Luganville, Espiritu Santo I., 100 m, 9.IX. 1957, ex fresh human excrement, Gressitt.

Myospila papuensis Vockeroth, new species Fig. 125, 134.

Rather small slender species with mesonotum grey or mostly reddish and with

abdomen reddish on about basal half. Length 5.9 to 6.3 mm.

♂. Head black; parafrontal, parafacial and face silvery-grey pollinose, cheek and occiput slightly grey pollinose. Front at narrowest point twice as wide as ocellar triangle; frontal vitta distinct throughout, at narrowest point as wide as parafrontal. Orbital bristles on entire length of front, decreasing in length caudad, last pair missing but situated at level of anterior margin of anterior ocellus. Antenna pale yellow. Palpus blackish on basal half, pale yellow on apical half, very slender.

Thorax mostly black; broad mesonotal margins, scutellum except basal half of disc, and much of upper half of pleura reddish-yellow; mesonotum and disc of scutellum with dense yellow-grey pollen which is more yellowish laterally on mesonotum; pleura with moderately heavy yellow-grey pollen, especially on mesopleuron and sternopleuron. Dorsocentrals arranged 2+4, first 2 postsuturals short but strong and distinct; anterior intraalar absent; prealar indistinguishable. Posterior spiracle very small, about 1/3 as long as beret. Prosternum, metasternum and sternite 1 bare. Wing slightly yellowish basally and anteriorly. Node of Rs with 1 or 2 short setae above and below. Vein M_{1+2} with apex curved very slightly but distinctly forward at apex. Posterior crossvein slightly curved. Squamae and haltere pale yellow. Legs bright yellow, tarsi distinctly brownish towards apex. Mid legs missing. Hind femur with 1 moderate anteroventral at 1/3 its length and 1 stronger and 1 weaker anteroventral near apex. Hind tibia with 1 anterodorsal and 1 anteroventral.

Abdomen yellow at base, becoming reddish towards apex, densely yellow-grey pollinose, tergite 4 except broad anterolateral angles and all of tergite 5 dark brown. Terminalia not examined.

♀. Very similar to ♂, differing as follows: Palpus very slightly broadened towards apex. Thorax usually mostly reddish-yellow and yellow pollinose, with only a broad dark mesonotal stripe narrower or slightly broader than space between dorsocentral rows, or with mesonotum and scutellum almost as dark as in ♂ but pleura reddish except for a small brown spot near lower end of sternopleuron. Anterior intraalar and prealar distinct, moderately strong. Vein R_{4+5} with 2 or 3 setae above and below, 1 dorsal and 1 ventral seta distinctly elongate, at least as long as anterior crossvein. Mid femur with about 4 weak anteroventrals and 3 moderately strong posteroventrals on basal 1/3. Hind femur with anteroventrals a little stronger. Mid tibia with 2 posterior bristles. Abdomen reddish-yellow, pollinose, sometimes with disc of tergites 3 and 4 obscurely greyish. Terminalia (Fig. 125): Tergite 7 considerably broader than long, anteromedian emargination very small or absent, anterolateral angles strongly oblique, posterolateral angles produced only slightly ventrad. Sternite 7 long and slender, about 8 × as long as broad, slightly broader at base, with 2 short apical setae. Tergite 8 with anterolateral portions short, broad, subtriangular, narrowly fused sublaterally to posterior portion, latter with setae irregular in length and strength, 1 or 2 towards lateral margin slightly stronger than others. Halves of sternite 8 each with 7 or 8 moderately strong setae of irregular length on apical 1/3, that at apex distinctly longer than others. Epiproct slightly longer than broad, bluntly rounded apically. Cercus about $1\text{-}^1/_2$ × as long as broad, bluntly rounded apically. Hypoproct very deep throughout, turned abruptly upward at 2/3 its length.

Egg (Fig. 134). Anterior filaments acute and tapering, about 1/6 as long as body of egg; anteromedian process very short and bluntly rounded; filaments and process both with irregularly papillate margins. Inner surface of flange and egg surface between flanges with strong hexagonal reticulation; outer surface of flange without discernible reticulation; rest of surface of egg with very faint hexagonal reticulation. One abdomen with 2 eggs examined.

DISTRIBUTION. New Guinea.

Types. Holotype ♂ (BISHOP 9611), Laloki, nr Port Moresby, SE New Guinea, 30.VII - 2.IX.1959, T. C. Maa. Paratypes (BISHOP, BMNH): 3♀♀, same data as

holotype; 1 ♀, Oriomo Govt. Sta., Western District, SE New Guinea, 26-28.X.1960, J. L. Gressitt.

Myospila pallidibasis Vockeroth, new species Fig. 124.

Rather small robust species with thorax pale laterally and abdomen pale basally. Length 5.2 to 6.0 mm.

♂. Head black; parafrontals, parafacial and face silvery pollinose; cheek and postcranium slightly grey pollinose. Front at narrowest point very slightly broader than ocellar triangle; frontal vitta distinct throughout, at narrowest point slightly narrower than anterior ocellus and only about half as wide as parafrontal. Orbital bristles present on entire length of front, in 5 or 6 fairly regular pairs, decreasing only slightly in length and strength caudad followed by a rather short proclinate pair situated only very slightly in front of level of anterior ocellus. Antenna with first 2 segments dark yellow, third pale yellow. Palpus with basal third yellowish, apical 2/3 dark brown and distinctly broadened.

Thorax black; humerus, notopleuron, upper and anterior portions of mesopleuron and anterodorsal portion of sternopleuron dull yellow to yellow-brown, most of rest of pleura dark brown to blackish; mesonotum and disc of scutellum olive-grey pollinose, former with a pair of narrow stripes just inside dorsocentral rows which are broadened posteriorly and extend slightly laterad of last 2 pairs of dorsocentrals; pleura slightly white pollinose. Dorsocentrals arranged 2 + 4, first 4 moderately strong, last 2 strong; anterior intraalar and prealar both short and weak but quite distinct. Posterior spiracle small, a little less than half as long as beret. Prosternum, metasternum and sternite 1 bare. Wing only very slightly yellowish anterobasally. Node of Rs with 2 or 3 setae above and 1 or 2 below. Vein M_{1+2} curved barely perceptibly forward at apex. Squamae and haltere pale yellow. Legs with coxae yellow-brown, trochanters bright yellow, femora blackish-brown with narrow yellow apices, fore and mid tibiae yellow, hind tibia very slightly brownish, tarsi yellow, not darkened apically. Mid femur with 3 weak anteroventrals and 3 slightly stronger posteroventrals on basal half. Hind femur with 2 very weak anteroventrals near base and 2 or 3 stronger anteroventrals near apex. Mid tibia with 2 posterior bristles. Hind tibia with 1 anterodorsal and 1 anteroventral. Abdomen shining, its dark areas with only very light pollen. Tergite 2 pale yellow except for a brownish anteromedian spot. Tergite 3 pale yellow except for blackish posterior triangle which is as wide as dorsal surface of tergite and reaches the anterior margin only medially. Tergites 4 and 5 black, former obscurely yellow anterolaterally and latter at extreme apex. Terminalia not examined.

♀. Very similar to ♂, differing as follows: Palpus slightly more strongly broadened. Yellowish color of dorsum of thorax a little darker but extending obscurely mediad to dorsocentrals presuturally and to intraalars postsuturally. Pleura entirely dull yellow. Node of R_s with 2 setae above and 2 below. Hind tibia brown. Tergite 2 entirely dull yellow except for narrow brownish posterior margin. Tergites 3 and 4 mostly black, narrowly yellowish anterolaterally. Tergite 5 black with slightly less than apical half red, black portion strongly white pollinose. Terminalia (Fig. 124): Not at all compressed, nearly cylindrical. Tergite 7 twice as broad as long, anterior emargination broad and very shallow, anterior processes scarcely apparent. Sternite 7 short, about as long as tergite, twice as long as broad, with sides less heavily sclerotized than median portion, with 2 short and 2 long slender setae near apex. Tergite 8 with anterolateral portions subtriangular, well separated medially, each with slender anteroventrally directed anterolateral process, narrowly separated from posterior portion, latter narrowly divided medially and gradually broadened laterally, with a row of nearly uniform slender setae. Each half of sternite 8 reduced to a minute weak sclerite with 1 rather long and 1 or 2 very short weak setae. Epiproct about twice as broad as long. Cercus about $2\text{-}^1/_2$ × as long as broad, rounded apically. Hypoproct very shallow, curved only very slightly and gradually upward posteriorly. Membrane between segments 7 and 8 with spines rather sparse, not flattened, appearing as short fine setae.

DISTRIBUTION. New Guinea, ca 90-200 m.

Types. Holotype ♂ (BMNH), Vanapa R., Central District, SE New Guinea, ca 200 m, 7.V.1965, R.W. Crosskey. Paratype ♀ (BISHOP): Sentani, NW New Guinea, 90 ± m, 15.VI.1959, T.C. Maa.

DISCUSSION. In the ♀, the cylindrical form of the terminalia, very broad tergite 7, short broad sternite 7 with a cluster of apical setae, divided posterior portion of tergite 8, and greatly reduced sternite 8 distinguish the terminalia very sharply from those of other species examined with the exception of *novaebrittaniae* n. sp. The latter differs from *pallidibasis* apparently only in color and the 2 forms should perhaps be considered conspecific. The possible significance of the form of the terminalia is discussed above following the general description of *Myospila.*

Myospila novaebrittaniae Vockeroth, new species Fig. 135.

Rather small robust shining blackish species with thorax obscurely striped and abdomen reddish at apex. Length 6.3 to 7.0 mm.

♀. Structurally not definitely distinguishable from that of *pallidibasis*, differing mostly in color as follows: Palpus dark brown. Thorax black, only humerus slightly yellowish. Node of Rs with 2 to 6 setae above and below. Tibiae yellow, hind tibiae not darker than others. Abdomen black, only tergite 5 with apical half or slightly more reddish-yellow; tergites 1 to 4 shining, tergite 5 with black portion densely white pollinose. Terminalia as in *pallidibasis* (Fig. 124). ♂. Unknown.

Egg (Fig. 135). Anterolateral flanges truncate anteriorly, not extending beyond egg as anterior filaments; anterior end of egg bluntly rounded, not produced as an anteromedian process. Inner surface of flange and extreme anterior end of surface of egg minutely papillate, without distinct reticulation; outer surface of flange and remainder of surface of egg with fine distinct hexagonal reticulation. Micropyle at 1/9 length of underside of egg. One abdomen with 3 eggs examined.

DISTRIBUTION. New Britain.

Types. Holotype ♀ (BMNH), Keravat, New Britain, 25-30.VI.1965, R.W. Crosskey. Paratypes (BISHOP, CNC): 3♀♀, Gaulim, Gazelle Penin., New Britain, 130 m, 28.X.1962, J. Sedlacek.

DISCUSSION. This form should perhaps be considered conspecific with *pallidibasis* from New Guinea from which it differs, in the ♀, only in color. The ♀ terminalia of both are nearly cylindrical and differ rather markedly from those of other species of the genus. The possible significance of the form of the egg and of the terminalia are discussed above in the introduction to *Myospila.*

Myospila effeminata Vockeroth, new species Fig. 101, 126.

Very small yellowish species with elongate antennae and very broad ♂ front. Length 4.6 mm.

♂. Head (Fig. 101) mostly black, face yellow, frontal vitta lightly and parafrontal, parafacial and face densely silvery pollinose; cheek and occiput lightly grey pollinose. Front very broad, narrowest at level of posterior ocelli where it is about $2\text{-}^1/_2$ × as broad as ocellar triangle and about

1/6 width of head; parafrontal narrow above, wider below, at middle of front about 1/7 total frontal width. Front with a pair of strong convergent orbitals at lower end followed by 3 pairs of weaker proclinate and slightly convergent orbitals on lower 2/3 of front and a pair of reclinate orbitals, as strong as those proclinate ones, slightly below level of lower ocellus. Inner and outer verticals and postocellars distinct, moderately long and strong but smaller than in the ♀, inner verticals longer than others. Antenna very long and rather broad, extending to level of base of major vibrissa, in anterior view segment 3 about 6 × as long as 2. First 2 antennal segments yellow-brown, third pale yellow. Palpus pale yellow, very slender throughout.

Thorax pale yellow, disc of mesonotum blackish medially, brownish laterally; mesonotum with a broad stripe of grey pollen on each side extending from just mediad of dorsocentrals to about level of posthumeral and intraalar. Scutellum and pleura not distinctly pollinose. Dorsocentrals arranged 2+3, strong, first postsutural about twice as far from second as from suture; anterior intraalar and prealar absent. Posterior spiracle very small, about 1/3 as long as beret. Prosternum, metasternum and sternite 1 bare. Wing clear. Node of Rs above with 2 short weak setae and with 1 strong seta as long as anterior crossvein, below with a single strong setae as long as crossvein. Vein M_{1+2} curved slightly but distinctly forward at apex. Posterior crossvein slightly curved. Squamae and haltere pale yellow. Legs pale yellow. Mid femur with very short weak anteroventrals, with 2 moderate posteroventrals on basal third. Hind femur with a moderate anteroventral near midlength and with 2 weak and 1 strong anteroventrals near apex, with a weak posteroventral near midlength. Mid tibia with 2 posterior bristles. Hind tibia with 1 anterodorsal, 1 or 2 anteroventrals. Abdomen yellow, reddish-yellow on apical half, shining. Terminalia not examined.

♀. Very similar to ♂, with orbital bristles as in ♂, differing as follows: Front at narrowest point, at level of upper ocelli, about 1/4 as wide as head. Antennal segment 3 in anterior view 3-1/2 × as long as 2, not extending quite to level of lower vibrissa. Thorax generally slightly darker, reddish-yellow, but disc of mesonotum only slightly brownish, not at all blackened. Sternopleurals arranged 2:2, lower anterior weak but distinct. Wings and mid and hind legs missing; fore legs yellow. Terminalia (Fig. 126) rather strongly compressed. Tergite 7 rather heavily sclerotized, very broad anteriorly, without median anterior emargination, anterior end produced dorsad and cephalad, tergite in lateral view subtriangular, posterolateral angle produced caudad as a weakly sclerotized slender process. Sternite 7 long and slender, with 2 short apical setae. Tergite 8 with anterolateral portions large, subquadrate, narrowly joined submedially and sublaterally to posterior portion, latter with 5 short, moderately stout, uniform setae on its median 1/3. Halves of sternite 8 very slender basally and strongly broadened towards spex, each with about 10 setae, last 1 or 2 of which are slightly longer and stronger. Epiproct about 3 × as broad as long, anterolateral angles long and slender, apex subacute. Cercus subcircular, as broad as long. Hypoproct distinctly compressed, turned abruptly upward at 3/4 its length, each anterolateral angle produced dorsad as a short blunt process. Membrane between segments 7 and 8 with many very fine setae which do not extend dorsad above level of lateral margin of tergite 7.

DISTRIBUTION. Fiji.

Types. Holotype ♂ (BISHOP 9612), Nadarivatu, Viti Levu, 850 m, 8-13. III. 1963, C. M. Yoshimoto. Paratype ♀ (BISHOP): Lami, 1920, C. E. Pemberton.

DISCUSSION. This is the only species of *Myospila* with the front of the ♂ nearly as broad as that of the ♀ and with the same frontal bristling in both sexes. Whereas the terminalia of the ♀ indicate the species should be referred to *Myospila*, it differs from the other regional species in having the terminalia more strongly compressed and in the shape of tergite 7, tergite 8, epiproct, cercus and hypoproct.

The ♂ of *Myospila effeminata*, as well as those of 4 other species of Mydaeinae from the Indo-Australian area, differs from those of the other regional species in a number of characters of head structure which show a remarkable degree of correlation. The other 4 species are *Lasiopelta longicornis* (Stein), *Gymnopapuaia paula* n. sp., *G. feminina* n. sp., and *G. magnicornis* n. sp. In the first 4 of these the front of the ♂ is as wide or almost as wide as that of the ♀ (from 1/4 to a little more than 1/3 as wide as the head), the orbital bristles are essentially as in the ♀, with 1 or 2 upper orbitals present, and the inner and outer verticals and postocellars are usually long and strong (in *effeminata* they are distinctly shorter than in the ♀ but are quite distinct). In the fifth species, *G. magnicornis*, the front is only slightly wider than usual (about 1/7 head width), and the vertical bristles and postocellars, although elongate, are very weak and not clearly differentiated from the long postocular hairs. There are, however, 4 pairs of long and rather strong lower orbital bristles, of which the upper 3 are much longer than in known ♀♀ of the genus, and 2 pairs of long and rather strong upper orbitals. In these 5 species, and in no other Mydaeinae in this region, the antennae are proportionately much longer in relation to the head height, and, except in *L. longicornis*, the segment 3 is much longer in relation to 2, than in those species of the same genera in which the ♂ front is narrow and the frontal and vertical bristling very different in the 2 sexes. The greatest area of antennal surface in relation to area of head surface is probably in *G. magnicornis*, in which the antennae are not only very elongate but also greatly broadened. The increase in antennal length is associated with a change in the frontofacial angle (Fig. 23, 101, and Fig. 110 of van Emden (1965), vs. Fig. 21, 99), so the front is much more nearly horizontal than in normal species, and the antennae are inserted much higher on the head. Associated with the broadening of the front is a reduction in relative eye size compared with normal ♂♂. The facets on about the anterior 1/4 of the eye are larger than the others, but the area of distinctly enlarged facets is proportionately smaller than in ♂♂ with a narrow front. One other feature shared by all but 1 of these species is their reduced body size. All the species except *G. magnicornis* are markedly smaller than any species of the same genera known to me in which the ♂♂ have a normal narrow front.

There are a number of cases in various groups of Muscidae, both in New Guinea and in other areas, in which broad-fronted ♂♂ in groups where the ♂ front is usually narrow have distinctly enlarged antennae. Such a correlation is, however, far from invariable. I have seen about 10 species of *Orthellia* (Muscinae) from New Guinea (most of them undescribed). Of these only 1 species has a broad ♂ front and upper orbital bristles; it has the front nearly horizontal, has long and rather broad antennae, and is the smallest of the New Guinea species. Hennig (1955-64) described 4 Palaearctic species of *Phaonia* (Phaoniinae) in which the ♂ front is very broad and bears upper orbital bristles, and for each of these the antennae are described as being unusually long and broad. The species are *Phaonia atriceps* (Loew), 1858, *P. erinacea* (Fallén), 1824, *P. steinii* (Strobl), 1898, and *P. longicornis* Stein, 1916. Hennig figured the ♂ heads of the first 3 of these species (*op. cit.*, Figs. 318-320), and in a later paper (Hennig, 1965) he referred these 3 species to the genus *Dialyta*. Hennig (1955-64) also described *Phaonia magnicornis* (Zetterstedt), 1845, and *P. stackelbergi* Hennig, 1963, as having a moderately broad front, no upper orbital bristles, and very long antennae. I

have not examined specimens of these 6 species. The Nearctic species *Dialyta flavitibia* Johannsen, 1916, has the ♂ head as described above for European *Dialyta*. The Nearctic species *Phaonia pallidula* Huckett, 1965, has a similar ♂ head and antennae, and is unusually small and slender compared with most other species of the genus. I have examined the ♀ terminalia of *pallidula*; they are of the *Phaonia* type rather than of the *Dialyta* type as described by Hennig (1965). *Oramydaea latifrons* Snyder, 1949, a species from West Africa possibly referable to the Mydaeinae, has a broad front, a weak reclinate upper orbital and very long antennae in the ♂, according to the figures published by Snyder. The slender sclerotized proboscis described by Snyder is, according to Peris (1965), almost certainly an aberration. If Peris is correct the species (and genus) would seem to be characterized primarily by the ♂ head characters mentioned here; it is possible that the species should be referred to a genus in which the ♂♂ normally have a narrow front. Study of the terminalia of the presently unknown ♀ might indicate the relationships of the species. It is interesting that in *O. latifrons* the facial ridges have several rows of fine setae throughout, a character found in few if any other Muscidae, and that in *Gymnopapuaia magnicornis*, which has the head profile very similar to that of *O. latifrons*, the setae of the facial ridges are longer, stronger and extend farther dorsad than in the other species of *Gymnopapuaia*.

However, in the large genera *Helina* and *Dichaetomyia* (Phaoniinae), in which the head structure and body shape are in most cases similar to that of most Mydaeinae and of most *Phaonia*, species with a broad ♂ front do not, as far as I can determine, have enlarged antennae. The only broad-fronted species of *Helina* I have examined is the Nearctic *Helina spinosa* (Walker), 1849; the antennae are of approximately the same size as in the many species with a narrow front. Published descriptions indicate that the same condition is found in other species — in no case do the descriptions of broad-fronted ♂♂ referred to below indicate that the antennae are enlarged. The genus, the number of species with broad-fronted ♂♂, the zoogeographic region, and the source of my information are as follows: *Helina*, 6 species, Palaearctic (Hennig, 1955-64, p. 147); *Helina*, 2 species (apart from *H. spinosa*), Nearctic (Snyder, 1949c); *Helina*, 2 species, Ethiopian (van Emden, 1951); *Dichaetomyia*, 1 species, Oriental (van Emden, 1965). I have seen also 1 other species of *Dichaetomyia* from New Guinea in which the ♂ front is broad but the antennae are of normal size.

The occurrence, in species of so many genera, of a broad front and enlarged antennae suggests that the combination of these 2 characters must have some functional significance. A possible explanation is outlined below. The ♂♂ of many species of Muscidae and of other families of Calypterae are known to be active and highly aerial, taking stations in exposed places presumably as a part of their mate-finding behaviour. I think it probable that such behaviour will be found to be confined largely or perhaps entirely to those species with narrow-fronted ♂♂, and that visual perception plays a major part in the process. McAlpine & Munroe (1968) have discussed the apparent significance of eye size in the swarming and mating behaviour of certain Diptera Schizophora but did not consider the possible significance of variations in antennal size. Increase in width of the front and corresponding reduction in size of the eyes is likely to reduce the effectivenss of such a method of finding mates or perhaps even to make

it impossible; the frequent occurrence of enlarged antennae in such species suggests that possibly the antennae are involved in the finding of mates and the stimuli responded to are likely to be chemical, or possibly tactile, rather than visual. Such behaviour would perhaps be beneficial to species which occur in habitats where sites for station-taking are few or absent, such as areas of low sparse vegetation or marshes where vegetation is often very dense and rather uniform in height. The Nearctic species *Dialyta flavitibia* occurs in marshes, and the Palaearctic *Dialyta atriceps* (referred to above as *Phaonia atriceps*) has been recorded by Kröber (1932) and Fonseca (1968) as having been reared from larvae in *Typha latifolia* L., a very common plant of marshes. I can think of no plausible reason for lack of increase in antennal size in the broad-fronted species of *Helina* and *Dichaetomyia* referred to above. Study of the behaviour of species of this type, as well as of the other 2 types discussed above, might be very rewarding.

I am indebted to my colleague, Dr D.M. Wood, for useful discussions of the subject. He had independently arrived at similar conclusions concerning the relationship beween ♂ head structure and behaviour as a result of his studies of Tachinidae.

Genus **Graphomya** Robineau-Desvoidy

Graphomya Robineau-Desvoidy, 1830, *Myodaires*, p. 403; Hennig, 1955-64, *Fliegen Palaearkt. Reg.* **7** (2): 231; 1965, *Stuttg. Beitr. Naturk.* **141**:50; Snyder, 1965, *Insects Micronesia* **13** (6): 315. Type-species, *Musca maculata* Scopoli, 1763 (subsequent designation, Rondani, 1856, p. 91).

Graphomyia Agassiz, 1846, *Nomen. Zool.*, p. 480 (emendation of *Graphomya*); Stein, 1919, *Nova Guinea* **13:** 201; Malloch, 1928, *Ent. Mitt.* **17**: 331; Mackerras, 1932, *Proc. Linn. Soc. N. S. W.* **57:** 361; Séguy, 1937, *Genera Insect.* **205:** 384; Collin, 1948, *Proc. R. Ent. Soc. Lond.* (**B**) **17:**125; Zimin, 1951, *Fauna SSSR* **18** (4): 241; van Emden, 1965, *Fauna India, Diptera* **7** (1): 544.

Rather small to large robust species with thorax very distinctly or rarely obscurely striped black and greyish-white; abdomen usually strongly pollinose and with distinct or obscure dark irregular markings but occasionally abdomen pale basally with a distinct black median stripe or entirely bright red-orange. Length 4.8 to 8.5 mm.

Eye usually with rather long dense hairs at least above in ♂ and with short sparse hair in ♀, sometimes virtually bare in both sexes. Upper anterior eye facets of ♂ sometimes enlarged. Front of ♂ at narrowest point varying in width from less than diameter of ocellus to about $1\text{-}^1/_2$ × width of ocellar triangle, rather strongly broadened anteriorly, frontal vitta distinct throughout or obliterated on 1/2 frontal length. Orbital bristles moderately strong, decreasing gradually in length caudad, 6 to 12 pairs in number, usually confined to lower 1/2 to 2/3 of front but in *setifrons* n. sp. extending to ocellar triangle, parafrontal usually with a few to very many, short to rather long hairs mediad and laterad of those bristles and between upper bristles and ocellar triangle, in *eximia* Stein front bare above bristles, in *setifrons* with only very few hairs interspersed among bristles. Front of ♀ broad, narrowed above, at level of antennal bases from 0.29 to 0.46 width of head, at vertex from 0.18 to 0.27 width of head; parafrontal usually markedly broadened anteriorly. Lower orbital bristles convergent, 5 to 8 pairs in number, rather irregular, lowest one strong to very strong, others slightly or markedly weaker; upper orbitals opposite ocellar triangle, short, reclinate, 1 or 2 pairs in number; front usually with many short hairs laterad and mediad of orbitals and interspersed with them, with only a few short hairs laterad of orbitals in *setifrons*. Lunule dark brown to black, antennae distinctly separated at base by a distance about equal to width of anterior ocellus. Face vertical above, lower third

protruding strongly forward, lower end of the facial ridge broadened and bearing many short strong black setae which are longer toward the major vibrissa. Arista long-plumose, apical 1/4 to 1/3 usually bare or with only 1 or 2 very short rays, in *setifrons* plumose to apex. Palpus long, slender or slightly broadened, very slightly and gradually enlarged on about apical 1/3. Thorax with 1 to 3 humeral bristles; 2 + 4 dorsocentrals, first postsutural sometimes weak but always distinct, other 3 of increasing length; posthumeral bristle strong, weak or absent; presutural bristle usually strong, absent only in *hypocrita* n. sp.; prealar strong, at most a little shorter and weaker than posterior notopleural, situated halfway between suture and supraalar or closer to suture than to supraalar; anterior supraalar strong, posterior absent; anterior intraalar absent, posterior strong; 3 postalars strong. Presutural acrostichal hairs in about 12 irregular rows; notopleuron with at least 6 hairs around posterior bristle, often with many hairs. Postalar declivity and suprasquamal ridge bare. Scutellum on basal half or more with many rather long fine black hairs laterally below level of marginal bristles, a very few of those near base on under side of the scutellum. Anterior mesopleural declivity with many rather long fine black hairs on about upper 2/3, these hairs extending ventrad to, or almost to, level of lower end of the spiracle; anterodorsal mesopleural bristle strong, weak or absent. Pteropleuron bare. Sternopleural bristles arranged 0:2, strong, very rarely 0:3 (0:1 only in *G. fascigera* Stein, 1920 from Java). Beret, and hypopleuron in front of spiracle and above hind coxa, with few to many, short to rather long black hairs, in some species one of the hairs in front of upper end of spiracle long, strong and bristle-like. Posterior spiracle rather small, not longer than beret. Prosternum and metasternum bare; sternite 1 densely haired. Wing unmarked. Node of R_5 and basal half or rather more of first section of R_{4+5} with rather fine but distinct setae above and below; veins otherwise bare. Vein M_{1+2} with apical 1/3 to 1/2 of last section curved moderately to rather strongly forward, width of cell R_{4+5} at apex from 1.9 to 4.0 × length of anterior crossvein; either apex of vein M_{1+2} at least as far from wing tip as is apex of vein R_{4+5} and proximad or at most very slightly distad of level of apex of R_{4+5} (Fig. 136, 137), or apex of M_{1+2} closer to wing tip than is apex of vein R_{4+5} and distinctly distad of level of apex of R_{4+5} (Fig. 138). Wing membrane entirely trichose (partly bare in 1 exotic species). Lower squama broad, posterior margin truncate, its anteromedian angle lying under anterolateral portion of scutellum. Mid femur with a complete or partial row of anterior bristles on basal half which are usually strong but are long only in *setifrons*, with usually very weak and inconspicuous anteroventrals and posteroventrals, with 2 or 3 rather weak to strong posterodorsals, sometimes with many of the posterior hairs rather long, strong and bristle-like. Hind femur with an entire row of anterodorsal to dorsal bristles, with an entire row of anteroventrals which may be very short and weak on basal half, sometimes with a few weak or moderately strong posteroventrals on basal half. Fore tibia with bristles only at apex. Mid tibia with a rather long strong posterior bristle at or a little beyond midlength, with a strong but shorter posterodorsal at 2/3 to 3/4 tibial length. Hind tibia with 1 anterodorsal and 1, or very rarely 2, anteroventrals a little beyond midlength, in ♂ of *setifrons* apical third of tibia with 3 additional long strong ventral bristles followed by a series of slightly shorter black ventral and posterior hairs with wavy tips (Fig. 146); apex of tibia with a strong dorsal bristle but without an anterodorsal. Abdomen with marginal bristles, and on tergite 5 also discal bristles, rather numerous but usually weak.

♂ *Terminalia* (Fig. 142-145). Sternite 5 with short posterolateral lobes tapering to a slender subacute or bluntly rounded apex. Cerci fused at a single point near lower end, broadly separated above, with abundant long hairs. Cercus produced ventrad into a short, compressed, bluntly rounded process which appears slender and nipple-like in posterior view. Surstylus short, about $1\text{-}^1/_2$ × as long as broad, broadly rounded apically, slightly concave externally and concave internally. Pregonite almost flat, fused with sternite 9, with about 4 minute setae basally. Postgonite short, about twice as long as broad, slightly compressed, very slightly narrowed on apical half, broadly rounded apically, with a few lateral punctures. Aedeagal spine broad, flat, bluntly rounded and not at all membranous apically.

♀ *Terminalia* (Fig. 147-150). Ovipositor short, broad, slightly depressed, rather well sclerotized especially dorsally, in dorsal view with part of tergite 6 projecting beyond tergite 5, ventrally about 1/2 as long as preabdomen. Tergite 6 short, broad, broadly divided, only slightly narrowed laterally, with a single or laterally double row of posterior setae; tergite 7 similar but with each half subtriangular, rather long medially with anteromedian angle slightly produced and rounded, strongly narrowed to posterolateral angle; tergite 8 similar but entire, with a distinct anteromedian emargination and sometimes also a shallow posteromedian emargination, a little broader anteriorly than posteriorly so lateral margin is oblique. Sternite 6 triangular with rounded angles and with apex at anterior end, equilateral or about twice as broad as long, with setae on posterior 1/3. Sternite 7 triangular, rather weak; anteromedian portion narrow or moderately broad, bare; posterior portion densely covered with short straight setae which often extend anteriorly onto membrane beside sternite or with longer straight or hooked setae; posterior margin with a median membranous incision so the sternite appears Y-shaped. Sternite 8 small, rather weak, broadly or rather narrowly divided, each half nearly circular or slightly elongate, with 1 or several slightly elongate and spine-like setae. Membrane between segments 7 and 8 short, scarcely longer than tergite 8, not lengthened ventrally, with weak, short or rather long and hair-like spicules. Epiproct short, broad, with 2 strong setae and many shorter hairs. Cerci short, broad, almost horizontal in position, medioventral (inner) surface briefly but distinctly sclerotized at apex and with many hairs. Hypoproct very large, only slightly convex, with a narrow basal strip set off from remainder by a depressed membranous area and haired only laterally, apical portion large, densely haired, apical margin broadly triangular.

Egg (Fig. 151). Long, slender about 1/2 as long as preabdomen, $4\text{-}^1/_2 \times$ as long as broad, with a pair of infolded appressed flanges along length of egg, each flange half as broad as egg and rounded at each end; body of egg rounded apically, without median apical process; micropyle at 1/12 length of egg. Margin of flange finely and uniformly scalloped, most of egg surface minutely papillate, papillae on anterior third of dorsal surface between flanges and on inner surface of flanges grouped into hexagonal clusters. Eggs 11 in number in the 1 gravid ♀ examined, without trace of developing larvae.

DISTRIBUTION. Essentially worldwide in temperate and tropical areas, absent from New Zealand and Oceania except Micronesia (and Hawaii, where 1 species has recently been accidently introduced); best developed in Oriental and Ethiopian regions.

DISCUSSION. The genus *Graphomya* is very distinct, and there has been little doubt as to its limits. The genus *Baliogutum* Aldrich from Australia is probably closely related; *Bryantina* Malloch from Java may be, but *Graphomuscina* Townsend from Angola is less likely to be, as the pteropleuron was described as haired. The regional species and the species of the Oriental and Ethiopian regions except *maculata* and its close relatives are apparently quite distinct from one another, but *maculata* (*q. v.*) seems to be either a single very variable species or a very confused complex of a considerable number of species.

The relationship of the genus to other groups of Muscidae has been very doubtful and disputed. It has been assigned to the Muscinae, to the Phaoniinae, to a separate (unnamed) subfamily, to the Stomoxydinae and, by Hennig (1955-64, 1965), to the Mydaeinae. I think this latter assignment is the most reasonable. These various assignments have been discussed by Collin (1948), by Hennig (*op. cit.*) and by van Emden (1965, pp. 25-28).

The larvae of *G. maculata* are aquatic to subaquatic (Keilin, 1917), unlike other known larvae of Mydaeinae.

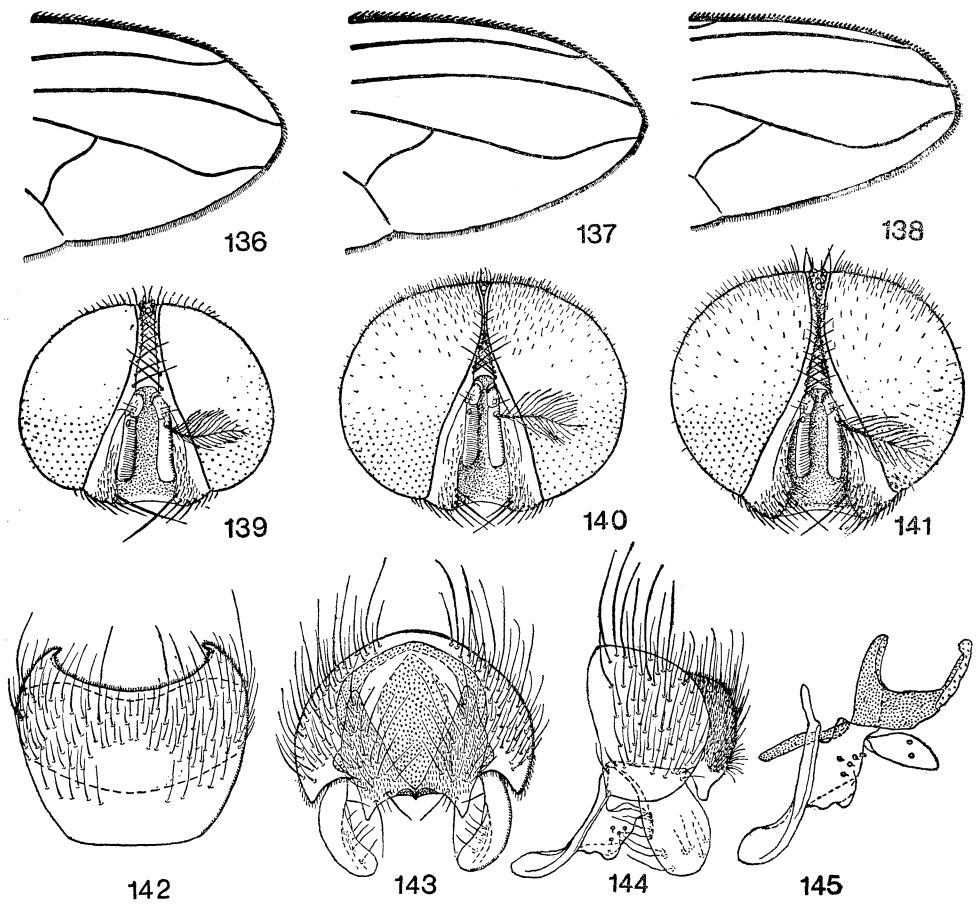

Fig. 136-145. 136-138, wing apex: 136, *Graphomya setifrons* n. sp., holotype; 137, *G. opima* n. sp., holotype; 138, *G. aurantioventris* n. sp., holotype. 139-141, ♂ head, anterior: 139, *G. setifrons*, holotype; 140, *G. opima*, holotype; 141, *G. aurantioventris*, holotype. 142-145, *G. maculata* (Scopoli), ♂: 142, sternite 5, ventral; 143, tergite 9, cerci and surstyli, posterior; 144, terminalia, lateral; 145, sternite 9 and genitalia (aedeagus stippled).

Key to Regional Species of Graphomya

1. Apex of vein M_{1+2} at least as far from wing tip as is apex of vein R_{4+5} and basad or at most very slightly distad of level of apex of R_{4+5} (Fig. 136, 137); anterodorsal mesopleural bristle usually present; ♀ with 2 reclinate upper orbital bristles 2

   Apex of M_{1+2} closer to wing tip than is apex of vein R_{4+5} and distinctly distad of level of apex of R_{4+5} (Fig. 138); anterodorsal mesopleural bristle absent; ♀ with 1 reclinate upper orbital 5

2. Sublateral black mesonotal stripe, between dorsocentrals and intraalar, ending posteriorly at or before level of last dorsocentral and broadly separated from postcallus by a pale pollinose

area; abdomen grey or yellow pollinose, with a pair of distinct or obscure dark submedian spots and a pair of smaller lateral spots on each of tergites 3 and 4; ♂, eye bare, orbital bristles present on entire length of front, frontal vitta distinct throughout, at its narrowest point twice as broad as parafrontal (Fig. 139); ♀, parafrontal broad, at middle of front about 2/3 as broad as frontal vitta, latter without hairs in front of anterior ocellus (New Guinea, Bismarck Arch.) ····· **setifrons** n. sp.

Submedian black mesonotal stripe reaching postcallus and narrowly or broadly confluent with black postcallar mark; abdomen entirely red-orange and unmarked or with very irregular dark entire or broken posterior bands on tergites 3 and 4; ♂ (unknown in *hypocrita*), eye with abundant hairs above, orbital bristles present on at most lower half of front, frontal vitta obliterated on at least upper half of front (Fig. 140); ♀, parafrontal narrow, at middle of front at most 2/5 as broad as frontal vitta, latter with at least a few fine hairs on midline in front of anterior ocellus ····· 3

3. Abdomen entirely red-orange, unmarked; mesopleuron black with diagonal line of pale grey pollen, posteroventral portion dark (Solomon Is.) ····· **hypocrita** n.sp.

Abdomen reddish, densely greyish-yellow pollinose, tergites 3 and 4 with irregular dark apical bands or with partly joined dark apical spots; mesopleuron broadly greyish-yellow pollinose posteroventrally, at most the broad dorsal and anterior margins dark ····· 4

4. Hypopleuron with fine uniform hairs in front of spiracle, without a bristle; pale pleural areas yellow-grey pollinose; pteropleuron mostly dark brown with only lower margin obscurely pale pollinose; ♂, upper anterior eye facets only slightly enlarged, frontal vitta obsolete on upper 1/2 of front (Fig. 140); ♀, ocellar bristles as strong or nearly as strong as outer verticals and at least 4/5 as long as latter, palpus more slender, 5 × as long as its maximum width (New Guinea) ····· **opima** n.sp.

Hypopleuron with 1 moderately long and strong bristle among fine hairs in front of spiracle; pale pleural areas yellow-orange pollinose; pteropleuron brownish only dorsally and posteriorly, at least anteroventral half yellow-orange pollinose; ♂ upper anterior eye facets strongly enlarged, frontal vitta obsolete on upper 2/3 of front; ♀ ocellar bristles distinctly weaker than outer verticals and at most 2/3 as long as latter, palpus stouter, 4 × as long as its maximum width (New Guinea) ····· **eximia** Stein

5. Abdomen entirely red-orange, normally unmarked and only obscurely pollinose, at most slightly darkened apically (due apparently to internal decomposition); ♂, front at narrowest point slightly narrower than ocellar triangle, frontal vitta obliterated on most of upper half of front (Fig. 141) (Solomon Is., Bismarck Arch.) ····· **aurantioventris** n. sp.

Abdomen with broad black median stripe or with a diffuse pattern of dark markings and pollinose areas; ♂, front at narrowest point slightly broader than ocellar triangle, frontal vitta distinct throughout ····· 6

6. Abdomen with scattered and diffuse dark markings which are more distinct in ♂ than in ♀, without an entire black median stripe; tergite 3 with a median elongate black mark, a pair of dark submedian spots which extend almost length of the tergite and are considerably broadened posteriorly, and with a pair of dark posterolateral spots; tergite 4 with similar markings but with median stripe narrow and submedian spots much smaller and almost circular; ♂, hairs on anteroventral part of eye very much shorter and sparser than those on dorsal part ····· 7

(♂ only; ♀ unknown). Abdomen with broad entire black median stripe which is broadened anteriorly on tergite 2 and posteriorly on tergites 2 to 4, remainder of these tergites pale yellow to yellow-orange and without distinct markings; eye with hairs on anteroven-

tral part as long as and only slightly sparser than those on dorsal part (New Guinea)……
……**mediolinea** n. sp.

7. ♂, Frontal vitta at narrowest point of front slightly narrower than parafrontal, latter with a sparse irregular single row of hairs laterad of orbital bristles; ♀, hairs of parafrontal usually sparse, at midlength of front usually not extending more than halfway from orbital bristles to eye margin, in Australian specimens sometimes extending almost to eye margin; ♂ & ♀, mesonotum with median dark postsutural stripe narrow, extending laterad at most to base of prescutellar acrostichal bristle, separated anteriorly from dark submedian presutural stripes (Palau, Micronesia; probably New Guinea and Australia; apparently widespread in Oriental region)……**rufitibia** Stein

♂, Frontal vitta at narrowest point of front from 1.4 to 2.5 × as wide as parafrontal, latter with a rather dense double row of hairs laterad of orbital bristles; ♀, hairs of parafrontal moderately to very dense, at midlength of front extending at least 2/3 of distance from orbital bristles to eye margin; ♂ & ♀, thorax with median dark postsutural stripe usually broad and extending laterad well beyond level of base of prescutellar acrostichal bristle, in ♂ fused anteriorly with dark submedian presutural stripes (in Hawaiian specimens only, postsutural median stripe narrow) (New Guinea, Micronesia, Hawaii; also Oriental, Ethiopian, and Holarctic regions)……**maculata** (Scopoli)

Graphomya setifrons Vockeroth, new species Fig. 136, 139, 146, 147.

Small species with distinctly striped thorax, and grey or greyish-yellow abdomen bearing small submedian spots. Length 5.2 to 5.9 mm.

♂. Head (Fig. 139) black; parafrontal and parafacial grey pollinose, cheek below eye dark brown pollinose, rest of cheek, face, and occiput grey pollinose. Eye bare, upper anterior facets only very slightly enlarged. Front at narrowest point slightly wider than ocellar triangle, at this point the parafrontal about 1/2 as wide as frontal vitta. Front with about 8 slightly irregular pairs of convergent orbital bristles on its entire length, the bristles decreasing only slightly in length and strength caudad, a few fine hairs present in row of orbitals but none mediad or laterad of them. Antenna brownish-black, segment 3 obscurely paler at base. Arista with rays extending almost to apex, without long bare apical portion. Palpus brownish-black.

Thorax black; mesonotum and scutellum densely pale grey pollinose except for a broad black median stripe almost as broad as space between dorsocentrals and extending onto disc of scutellum, a broad black submedian stripe laterad of the dorsocentrals which extends laterad presuturally to the humerus and the presutural bristle and divides just beyond the suture with the broader inner arm tapering to a point just beyond the level of the intraalar and the narrower outer arm extending posterolaterad to the outer end of the postcallus, a very narrow lateral presutural black stripe, black anterolateral angles of the scutellum, and a blackish postcallus. Pleura moderately grey pollinose, only the anterior and posteroventral portions of mesopleuron and a broad vertical stripe on middle of sternopleuron blackish. Posthumeral bristle and presutural bristle both strong. Mesonotum sparsely haired, notopleuron with only 6 or 7 hairs around posterior bristle. Mesopleuron with moderately strong anterodorsal bristle. Beret with 2 or 3 hairs; hypopleuron with 5 or 6 fine hairs and 1 long strong bristle-like hair in front of posterior spiracle. Spiracle small, about 2/3 as long as beret. Wing (Fig. 136) with about apical 1/3 of last section of vein M_{1+2} curved only slightly forward, apical width of cell R_{4+5} 4.0 × length of anterior crossvein; apex of M_{1+2} much farther from wing tip than is apex of vein R_{4+5} and slightly basad of level of apex of R_{4+5}. Squamae pale yellow-brown, broad apical margin of lower one darker. Haltere dark yellow. Legs black, tibiae obscurely reddish on basal half or slightly more. Mid femur with 5 of anterior bristles on basal half rather fine but as long as greatest depth of femur, with 2 strong posteroventrals on basal half but without other distinct

anteroventrals or posteroventrals. Hind femur with anteroventrals increasing in length toward apex, longest one as long as femoral diameter; posteroventrals on basal half distinct but short and weak. Hind tibia (Fig. 146) with 1 long strong anteroventral at 3/4 tibial length and very near it 3 ventrals of same length as anteroventral; distad of the ventrals and almost 2/3 their length are many strong black hairs with curved apices which become shorter towards tibial apex; posteriorly on apical 1/3 of

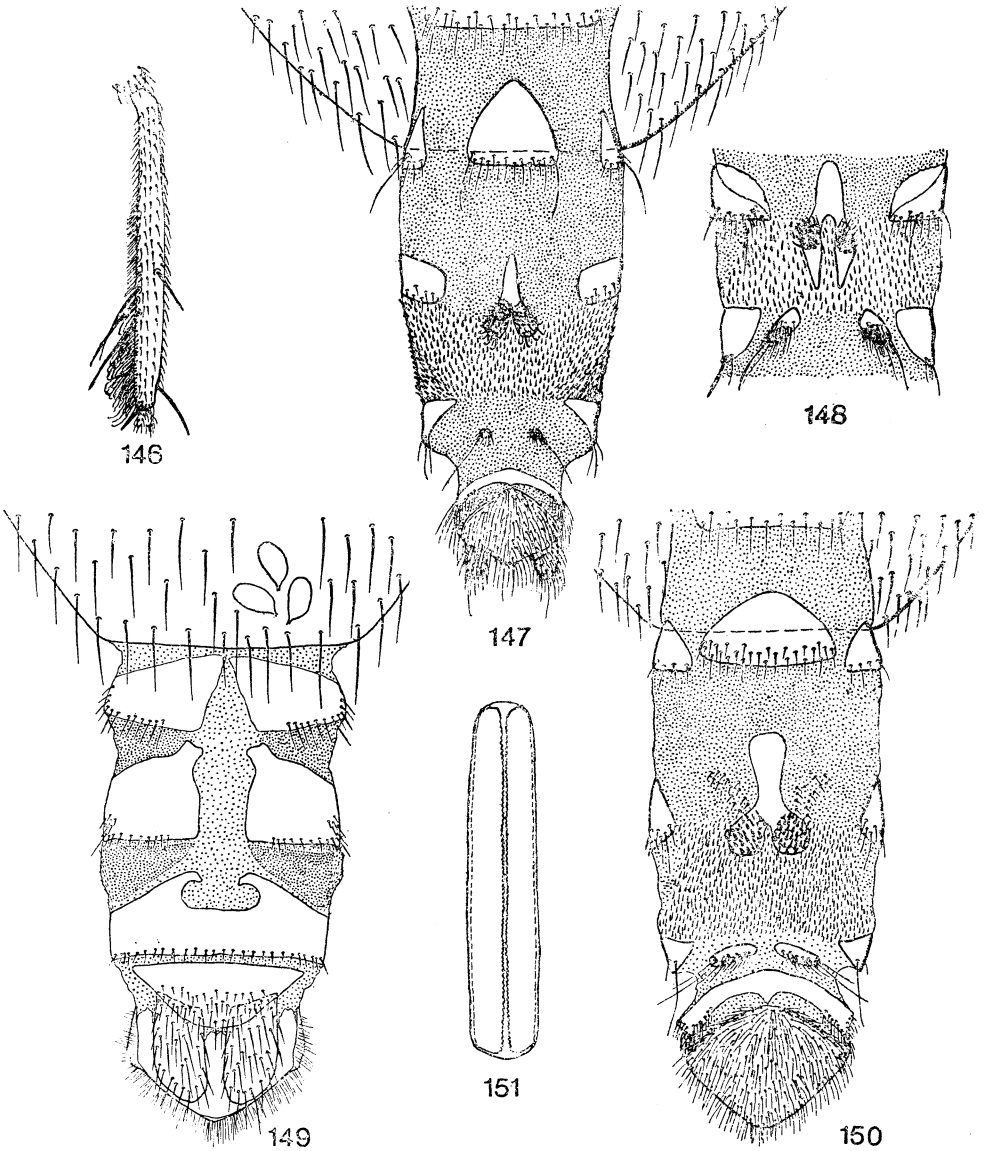

Fig. 146-151. 146, *Graphomya setifrons* n. sp., ♂ hind tibia, anterior, holotype; 147, *G. setifrons* n. sp., ♀ terminalia, ventral; 148, *G. maculata* (Scopoli), ♀ segments 7 and 8, ventral. 149-151, *G. hypocrita* n. sp., ♀ holotype: 149, terminalia, dorsal; 150, terminalia, ventral; 151, egg, dorsal.

tibia are many strong black suberect hairs which, near the tibial apex, have curved apices.

Abdomen black; narrow posterior margin of tergite 2, all of following tergites and all of sternites very densely pale grey pollinose, with only a pair of small rounded or subtriangular submedian black spots on posterior half of tergites 3 and 4, a pair of very small posterior lateral black spots on these tergites, and a pair of very small submedian brown pollinose spots on posterior half of tergite 5. Marginal and discal bristles of tergites moderately strong. Terminalia as described above for genus.

♀. Very similar to ♂, differing as follows: Front 0.42 head width at level of antennal bases, 0.25 head width at vertex; parafrontal at middle of front 2/3 width of frontal vitta, extending very slightly mediad of orbital bristles; frontal vitta without hairs on or near midline. Front with 5 or 6 pairs of moderately strong convergent orbitals and 2 pairs of short reclinate orbitals beside ocellar triangle, with a few short hairs laterad of and among orbitals but with none mediad of orbitals. Palpus black. Mesonotum with outer branch of sublateral black stripe detached from inner, present only as a narrow black stripe from supraalar bristle to outer end of postcallus. Pteropleuron posteriorly black only on extreme ventral margin. Anterior bristles of mid femur a little shorter and stronger. Hind tibia with 1 anterodorsal and 1 anteroventral, without ventral bristles or elongate ventral or posterior hairs. Abdomen with pollen more yellowish or brownish, much less uniform, distinctly mottled, submedian spots of tergites 3 and 4 smaller and less well-defined. Bristles of abdomen shorter and weaker. Terminalia (Fig. 147): Sternite 6 equilateral; sternite 7 with moderately long setae with hooked apices, these setae not extending onto membrane. Sternite 8 broadly divided, each half subcircular, with 1 longer apical seta. Membrane between sternites 7 and 8 with rather long fine hair-like spicules. Terminalia otherwise as described above for genus.

DISTRIBUTION. New Guinea, Bismarck Arch.

Types. Holotype ♂ (UZMC), Banatam, Lavongai, Bismarck Arch., 19. III. 1962. Paratypes (BISHOP, BMNH, UZMC): 2 ♀♀, same data as holotype but 18. III and 23. III; 1 ♂, Mendi, S Highlands, SE New Guinea, 1660 m, 13. X. 1958, in light trap, J. L. Gressitt.

DISCUSSION. This is the most distinctive regional species of the genus. It is much smaller than any other, has a uniformly bristled front and a bare eye in the ♂, an anterodorsal mesopleural bristle, a bristle-like hypopleural hair (found also in *hypocrita* and *eximia*), and a distinctive vestiture on the apical part of the hind tibia of the ♂. Other distinctive characters are noted in the key and in the generic description.

Graphomya hypocrita Vockeroth, new species Fig. 149-151.

Large species with distinctly striped black and pale grey mesonotum and unmarked orange-red abdomen. Length approximately 7.8 mm.

♀. Head black; parafrontal, parafacial, anterior end of cheek and occiput between eye and postocular setae densely greyish-white pollinose; face, rest of cheek and rest of occiput very obscurely grey-brown pollinose. Eye with extremely short scattered hairs, virtually bare. Front 0.39 × head width at level of antennal bases, 0.24 × head width at vertex; parafrontal at middle of front 1/4 width of frontal vitta, not extending mediad of orbital bristles; frontal vitta with a few fine hairs in front of anterior ocellus. Front with 6 or 7 pairs of convergent orbitals interspersed with weaker bristles and a few hairs, with 2 pairs of short but strong reclinate orbitals beside ocellar triangle, with a moderate number of short hairs laterad of orbitals but with none distinctly mediad of orbitals. Antenna and palpus black, latter rather broader than usual.

Thorax black; mesonotum and scutellum with dense greyish-white pollen leaving the following areas

black: a broad entire median line covering most of space between dorsocentrals, becoming gradually broader towards scutellum, broadened slightly at base of scutellum and then narrowed to a bluntly rounded apex just before apical scutellar bristles; a broad entire black stripe beginning just laterad of dorsocentrals and covering median margin of humerus, narrowing only slightly caudad, extending over posteromedial half of postcallus and confluent with the black basolateral scutellar spot; a very narrow lateral stripe beginning at the anterior end of notopleuron, covering bases of notopleural bristles, and continuing to anterior end of postcallus. Pleura mostly black, only the following portions pale grey pollinose: a diagonal band beginning just above middle of posterior margin of mesopleuron and extending anteroventrad across sternopleuron to anterior coxa, posterior third of the sternopleuron, and a small obscure spot anteroventrad of posterior spiracle. Presutural dorsocentrals and first 3 postsutural dorsocentrals short but distinct; posthumeral bristle very weak or absent, presutural bristle absent; notopleuron with a moderate number of hairs around bases of bristles. Anterodorsal mesopleural bristle present but short and weak. Beret with about 8 hairs; hypopleuron with about 6 hairs in front of spiracle, one of which is long, strong and bristle-like. Posterior spiracle small, about 1/3 as long as beret. Wing strongly yellowish anteriorly and basally, with about apical 1/3 of vein M_{1+2} curved only moderately forward, apical width of cell R_{4+5} 3.2 × length of anterior crossvein; apex of M_{1+2} much farther from wing tip than is apex of vein R_{4+5} and slightly basad of level of apex of R_{4+5}. Squamae and haltere dark yellow. Legs black. Mid femur with 3 rather weak but distinct posteroventrals on basal 1/3. Hind femur with about 3 weak anteroventrals on basal 1/3 and 1 weak and 1 strong anteroventral on apical 1/3, with 1 or 2 weak posteroventrals before midlength.

Abdomen bright red-orange, unmarked, not distinctly pollinose. Terminalia (Fig. 149, 150): Tergite 8 with rather broad and deep anterior emargination. Sternite 6 about twice as broad as long. Sternite 7 with very short straight setae which extend anterolaterad onto membrane beside bare basal portion of the sternite. Sternite 8 narrowly divided, each half rather elongate, with 1 apical seta elongate but slender. Membrane between sternites 7 and 8 with short spicules. Terminalia otherwise as described above for genus.

♂. Unknown.

Egg (Fig. 151). As described above for genus; 1 female with 11 eggs in abdomen, none of the eggs with trace of developing larvae.

DISTRIBUTION. Solomon Is.

Holotype ♀ (BISHOP 9613), Pepele, Kolombangara I., Solomon Is., 30 m, 13. II. 1964, P. Shanahan.

DISCUSSION. *G. hypocrita* is the only regional species of the genus in which the posthumeral bristle is absent. It is almost certainly more closely related to *eximia* Stein, *opima* n. sp., and *setifrons* n. sp., with which it shares the characters given in the first couplet of the key, than it is to *aurantioventris* n. sp., which, because of its unmarked red-orange abdomen, it superficially resembles. Both *hypocrita* and *aurantioventris* occur in the Solomon Is.; an unusually large species of *Heliographa* Malloch (Muscidae, Limnophorinae), with a bright red-orange abdomen although with a banded rather than a striped thorax, also occurs in the Solomon Is., and I think it probable that all 3 species are mimicking the same (unkown) model.

Graphomya opima Vockeroth, new species Fig. 137, 140.

Very large robust species with distinctly striped thorax and orange-brown banded abdomen. Length 7.8 to 8.1 mm.

♂. Head (Fig. 140) black; parafrontal and occiput between eye and postocular setae densely silvery-grey pollinose; cheek below eye brown pollinose; parafacial, face, rest of cheek and rest of occiput weakly grey pollinose. Eye with moderately long and dense hairs above, with very short sparse hairs below; upper anterior facets only very slightly enlarged. Front extremely narrow except anteriorly, at narrowest point narrower than anterior ocellus, frontal vitta obliterated on upper half of front except immediately below anterior ocellus. Front with 6 or 7 irregular pairs of orbital bristles on lower half, these bristles decreasing rapidly in length and strength caudad, with a few weak bristles and hairs among stronger bristles and with a few hairs mediad of bristles; with 1 pair of minute reclinate orbitals a short distance below the anterior ocellus, the upper half of front otherwise bare. Antenna black. Palpus black, apex narrowly grey pollinose below.

Thorax black, mesonotum and scutellum densely yellow-grey pollinose, leaving black stripes almost exactly as in *hypocrita*. Pleura black, slightly brownish pollinose, lower anterior portion of pteropleuron and hypopleuron anteroventrad of spiracle slightly yellow-grey pollinose, with densely yellow-grey pollinose areas as follows: mesopleuron except broad anterior and dorsal margins and narrow ventral margin, anterior 1/6 and posterior 1/2 of sternopleuron. Humerus with 2 bristles, inner one short and weak. Posthumeral bristle absent; presutural strong. Notopleuron with many hairs. Anterodorsal mesopleural bristle present but weak, or absent. Beret with about 10 long hairs; hypopleuron with about 6 short hairs in front of spiracle, without a distinct bristle. Posterior spiracle small, about half as long as beret. Wing with apical half of vein M_{1+2} curved rather strongly forward; apical width of cell R_{4+5} 1.75 × length of anterior crossvein; apex of M_{1+2} at least as far from wing tip as is apex of vein R_{4+5}, below or only very slightly distad of level of apex of R_{4+5} (Fig. 137). Squamae and haltere dull yellow. Legs black, tibiae very slightly brownish. Mid femur with 5 or 6 weak anteroventrals on basal half. Hind femur with an entire row of moderately long strong anteroventrals, with 3 moderately strong posteroventrals on second 1/4 of femoral length. Abdomen badly wetted in type, very dirty in paratype; color and pattern apparently as described for ♀ below. Terminalia as described above for genus.

♀. Similar to ♂, differing as follows: Eye above with distinct but extremely short and sparse hairs. Parafrontal brown pollinose on slightly less than upper half; rest of parafrontal and all of parafacial densely pale grey pollinose. Front 0.29 × head width at antennae, 0.18 × head width at vertex; parafrontal at middle of front 1/3 width of frontal vitta, extending only very slightly mediad of orbital bristles; frontal vitta with an obscure brown pollinose median stripe which begins at posterior end of ocellar triangle and narrows to an acute point at anterior end of front. Front with 7 or 8 pairs of convergent orbitals which vary greatly in length and strength, extend almost to level of anterior ocellus and have several weaker bristles and hairs interspersed; with many hairs laterad of orbitals, a few mediad of orbitals, and many on upper half of median pollinose frontal stripe; with 2 pairs of short but strong reclinate upper orbitals laterad of ocellar triangle. Ocellar bristles as strong or nearly as strong as outer verticals, at least 4/5 as long as latter. Palpus moderately stout, 5 × as long as its basal width. Pollen of mesonotum, scutellum and pleura bright yellowish-grey. Inner humeral bristle weak or strong. Posthumeral bristle absent or very short and weak. Anterodorsal mesopleural bristle absent or moderately strong. Apical width of cell R_{4+5} 2.0 to 2.2 × length of anterior crossvein. Hind femur with only 1 posteroventral. Abdomen orange-brown, densely and irregularly yellowish-grey pollinose, with darker markings concentrated on posterior portions of tergites as follows: tergite 2 very narrowly to rather broadly blackish posteriorly on about median 1/3; tergite 3 with posterior 1/2 medially and about posterior 1/3 to 1/4 laterally black to brownish black, this black posterior band with a broad median projection which reaches broadly the anterior margin of the tergite, and also with a pair of less distinct submedian anterior projections which scarcely reach the anterior margin; tergite 4 with a simliar dark posterior band but with median projection narrower and submedian projections shorter; tergite 5 with a narrow dark brown to black median stripe on anterior 2/3, beside posterior end of this stripe a pair of shorter and narrower dark submedian stripes

which are separated from median stripe or partly confluent with it. Terminalia very similar to those of *hypocrita* n. sp. (Fig. 149, 150) but setae of sternite 7 slightly longer and confined to the sclerite, and tergite 8 shorter, with broader and shallow anterior emargination and shallow but distinct posterior emargination.

DISTRIBUTION. New Guinea; 0-550 m.

Types. Holotype ♂ (BISHOP 9614), 11 km SE of Oerberfaren, nr Bodem, NW New Guinea, 100 m, 7-17. VII. 1959, T. C. Maa. Paratypes (BISHOP, AMS): 1 ♂, Wewak, NE New Guinea, 0-20 m, 11. X. 1957, J. L. Gressitt; 1 ♀, Ambunti nr Sepik R., NE New Guinea, 50 m, 9-10. V. 1963, on excrement in wet forest, R. Straatman; 1 ♀, Sogeri Plateau nr Port Moresby, SE New Guinea, ca 550 m, III-V. 1957, T. Schellen.

DISCUSSION. This species is very similar to *eximia* Stein; the differences between the 2 are given in the key and below in the diagnosis of the latter species. It is also very similar to *rufiventris* Stein, 1919, from Ceram. I have examined 1 ♂ of *rufiventris* from Piroe, Ceram (BISHOP). It differs from the ♂♂ of *eximia* and *opima* in having the parafacial and upper part of the cheek subshining black, the sublateral black thoracic stripe narrowed posteriorly, ending just before the level of the last dorsocentral and broadly separated from the black postcallus, the scutellum broadly black basally with only the apical margin pale pollinose, and the abdomen apparently entirely dull reddish with small irregular blackish margins due to internal decomposition. The eyes and front of the ♂ of *rufiventris* are similar to those of *opima*, and like *opima* it lacks a distinct bristle on the hypopleuron in front of the spiracle.

Graphomya atripes Malloch, 1926, described from Sumatra, is apparently also closely related to the above 3 species. I have examined a series of both sexes from Borneo (BISHOP). The ♂ has the upper eye facets larger than in *opima* and *rufiventris* but smaller than in *eximia*; the ♀ has the pollinose mid-frontal stripe bare; in both sexes the palpus is entirely red-orange, the scutellum is broadly black basally, and the hypopleuron lacks a bristle in front of the spiracle.

Graphomya eximia Stein

Graphomya eximia Stein, 1919, *Nova Guinea*, **13:** 199; Pont, 1968, *Ent. Ber., Amst.* **28:** 171.

Length 7.4 to 8.9 mm. Similar in both sexes (particularly in the ♀) to *opima* n. sp., differing as follows.

Thorax with pollen rather bright yellow-orange rather than yellow-grey, pollen more extensive on pleura so the mesopleuron is only narrowly dark brown anteriorly and dorsally and the pteropleuron is yellow-orange pollinose on about the anteroventral half. Humeral bristles 1 to 3 in number, posthumeral moderately long and strong, weak, or absent. Hypopleuron with 1 strong distinct bristle among fine hairs in front of spiracle. Femora and tibiae dark reddish-brown. ♂ with upper anterior eye facets greatly enlarged; eye hairs much less abundant; frontal vitta obsolete on upper 2/3 of front; apical width of cell R_{4+5} 1.7 to 2.0 × length of anterior crossvein. ♂ terminalia not examined. ♀ with eye hairs extremely short and sparse, scarcely distinguishable; ocellar bristles distinctly weaker than outer verticals, at most 2/3 as long as latter; palpus stouter, 4 × as long as its maximum width; apical width of cell R_{4+5} 2.4 to 2.7 × as long as anterior crossvein. ♀ terminalia very similar to those of *hypocrita* (Fig. 149, 150), including form of tergite 8, but, as in *opima*, with setae of tergite 7 slightly longer and not extending onto membrane.

DISTRIBUTION. New Guinea (1-760 m).

Type locality and type. Regeneiland (Regen Island), NE New Guinea. Lectotype ♂ in Zool. Mus. Amsterdam (Pont, 1968b).

SPECIMENS EXAMINED (BISHOP, BMNH, Zool. Mus. Amsterdam). NE NEW GUINEA: 1 ♂ (lectotype), Regen I., 20. XII. 1909, Lorenz; 1 ♂, 3 ♀♀ (paralectotypes), Bivak I., I. 1910, Lorenz. SW NEW GUINEA: 1 ♀ (paralectotype), Alkmaar, XII. 1909, Lorenz; 1 ♀, Camp III, Utakua Exped., 762 m, XII. 1912, C. Boden Kloss.

DISCUSSION. *G. eximia,* as indicated above, is apparently very closely related to *opima* n. sp. It is also similar to *G. rufiventris* Stein from Ceram and *G. atripes* Malloch from Sumatra and North Borneo; these 2 species are discussed above under *opima.*

Graphomya aurantioventris Vockeroth, new species Fig. 138, 141.

Very large robust species with distinctly striped thorax and bright red-orange unmarked abdomen. Length 7.4 to 8.5 mm.

♂. Head (Fig. 141) black; parafrontal, parafacial, cheek and occiput between eye and postocular setae densely yellowish-grey to pale grey pollinose; face and rest of occiput obscurely dark grey pollinose. Eye with moderately long and abundant hairs above, with very short sparse hairs below; upper anterior facets only very slightly enlarged. Front at narrowest point very slightly narrower than ocellar triangle; frontal vitta obliterated on about 1/3 length of front, from just before midlength almost to anterior ocellus. Front with 11 or 12 rather regular pairs of convergent orbitals on about lower 2/3, these bristles decreasing slightly and regularly in length caudad, with a very few hairs immediately laterad of bristles and rather more hairs among bristles, mediad of them, and between upper bristles and anterior ocellus. Antenna black. Palpus black, sometimes distinctly reddish on basal half.

Thorax black, mesonotum and scutellum densely yellowish-grey pollinose leaving black stripes almost exactly as in *hypocrita* except that the median stripe is a little narrower postsuturally, the sublateral stripe is a little narrower presuturally and ends slightly but distinctly before the postcallus, and the lateral stripe is narrower, not extending mediad of the notopleural bristles. Pleura black, mostly faintly brown or grey pollinose, densely yellow-grey pollinose on mesopleuron except broad anterior and dorsal margins, on anterior 1/6 and posterior 1/2 of sternopleuron and, less distinctly, on lower margin of pteropleuron. Posthumeral bristle weak but distinct; presutural bristle strong; notopleuron with hairs on most of its surface. Anterodorsal mesopleural bristle absent; sternopleural bristles usually 0:2, sometimes 0:3. Beret with 12 to 15 hairs, in 1 specimen 1 hair very strong and bristle-like; hypopleuron with 7 to 15 hairs in front of spiracle none of which is strong or bristle-like. Posterior spiracle small, scarcely more than half as long as beret. Wing with apical 1/2 of vein M_{1+2} curved rather strongly forward, apical width of cell R_{4+5} 1.7 × length of anterior crossvein; apex of M_{1+2} closer to wing tip than is apex of R_{4+5} and distinctly distad of level of apex of R_{4+5} (Fig. 138). Squamae and haltere dull yellow. Legs black. Mid femur with 3 or 4 weak posteroventrals on basal half, with posterior hairs more abundant, longer and stronger than usual. Hind femur with an entire row of anteroventrals which are short and weak toward base, with 2 weak posteroventrals before midlength.

Abdomen entirely bright red-orange, with only very obscure areas of yellowish pollen, otherwise unmarked. Terminalia not examined.

♀. Very similar to ♂, differing as follows: Eye with only very short sparse hairs. Front 0.37 × head width at antennae, 0.23 × head width at vertex; parafrontal at middle of front 1/3 width of

frontal vitta, not extending mediad of orbital bristles; frontal vitta without median pollinose stripe. Front with about 8 pairs of convergent orbital bristles extending almost to ocellar triangle and with interspersing weaker bristles and hairs, with a moderate number of hairs laterad of orbitals and a few mediad of orbitals but without median frontal hairs, and with 1 short but rather strong reclinate orbital beside ocellar triangle. Sublateral black mesonotal stripe sometimes very narrowly confluent with black postcallar mark. Posthumeral bristle short or absent. A third weak sternopleural bristle present on one side in 1 specimen. Hairs of beret fine. Mid and hind femora with anteroventrals and posteroventrals considerably shorter and weaker. Terminalia not examined.

DISTRIBUTION. Bismarck Arch., Solomon Is.

Types. Holotype ♂ (BMNH), Rasa, Isabel, Solomon Is., 30. IV. 1963, M. McQuillan. Paratypes (BMNH, BISHOP, UZMC): 1 ♂, same data as holotype; 1 ♂, Kukundu, SW coast Kolambangara I., New Georgia Group, 1-12 m, 8-11. VII. 1959, ex fresh human excrement, J.L. Gressitt; 1 ♂, Nalimbui R. to Gold Ridge, Guadalcanal, Solomon Is., 19. III. 1955, E.S. Brown; 1 ♀, mouth of Metanikau R., Guadalcanal, 26. V. 1944, H.E. Milliron; 1 ♀, Banatam, Lavongai, Bismarck Arch., 20. III. 1962.

DISCUSSION. This species is certainly more closely related to *maculata* and to *mediolinea* than to *hypocrita,* which it resembles very closely in color. The possible reason for this is discussed under *hypocrita.*

Graphomya maculata (Scopoli) Fig. 142-145, 148.

Musca maculata Scopoli, 1763, *Ent. Carn.*, p. 326.

Graphomyia maculata, Schiner, 1862, *Fauna Austriaca* **1:** 582; van Emden, 1939, *Ruwenzori Exped. 1934-35,* **2**(3): 56; Joyce, 1949, *Proc. Hawaii. Ent. Soc.* **13:** 329; Zimin, 1951, *Fauna SSSR* **18**(4): 242; van Emden, 1965, *Fauna India, Diptera* **7**(1): 552; Kano & Shinonaga 1965, *Illustrated Keys to Adult Filth Flies of Japan, 406th Med. Labor., U.S. Army Med. Command, Japan,* p. 7, pl. 51.

Graphomya maculata, Hennig, 1955-64, *Fliegen Palaearkt. Reg.* **7**(2): 233; Snyder, 1965, *Insects Micronesia* **13**(6): 316.

Medium-sized or rarely small species with rather indistinctly striped thorax and strongly mottled abdomen which in ♂ is often dull yellow-orange near the base. Length 4.8 to 8.1 mm.

♂. Head black, inner margin of parafacial and anterior part of cheek often obscurely reddish; parafrontal and parafacial golden-grey to silvery-grey pollinose; occiput between eye and postocular setae densely pale grey pollinose; face, cheek and rest of occiput sparsely dark grey pollinose. Eye with moderately long dense hairs above which become shorter and sparser ventrad and on at least lower 1/4 of anterior part of eye are much sparser than, and only about 1/3 as long as, dorsal hairs. Upper anterior eye facets not distinctly enlarged. Front moderately broad, at narrowest point 1.3 to 1.5 × as wide as ocellar triangle, strongly broadened below; frontal vitta broad throughout, at narrowest part of front from 1.4 to 2.5 × as wide as parafrontal. Front with about 9 to 12 pairs of strong, closely spaced, convergent orbitals on lower 3/5 of front which decrease only slightly in length caudad and have a few much weaker bristles and long hairs interspersed among them, without reclinate orbitals on upper part of front, with many rather long fine hairs in an irregular double row on parafrontal laterad of bristles, and with many similar hairs on frontal vitta mediad of bristles and on upper part of front between orbital bristles and anterior ocellus. Palpus black, apex slightly grey pollinose below.

Thorax black; mesonotum and scutellum rather densely grey to yellow-grey pollinose with following

areas black: a broad median stripe which covers most of the space between the dorsocentrals to just beyond the second postsutural dorsocentral and is then abruptly narrowed to a width equal to or a little more than the distance between prescutellar acrostichal bristles, and abruptly broadened again at the base of the scutellum and then narrowed regularly to a subacute point just before the apical scutellar bristles, the stripe on the mesonotum usually entire but sometimes obscurely or clearly divided into 2 anterolateral and 1 posteromedian black stripe by a median grey pollinose stripe which forks just behind the suture and extends posterolaterad to the point where the black stripe is abruptly narrowed or else by a pair of narrower submedian grey stripes which are separate throughout and diverge from one another from the anterior end of the mesonotum; a broad submedian stripe which extends from the humerus almost to the dorsocentrals anteriorly and forks at the suture into a slightly narrower inner branch which reaches the last 2 dorsocentrals on its inner margin and the intraalar on its outer margin and is then obliquely narrowed to a blunt point so it is separated from the postcallus by a grey pollinose area, and a much narrower outer branch which extends posterolaterad across the prealar and supraalar bristles to the outer end of the postcallus; a narrow obscure black stripe along the outer margin of the notopleuron; a narrow black stripe along all, or at least the posterior half, of the disc of the postcallus which is confluent with the large black laterobasal spot on the scutellum. Pleura lightly grey pollinose with obscure darker areas on mesopleuron and sternopleuron. Posthumeral bristle and presutural bristle both strong. Notopleuron with abundant hairs on most of surface. Mesopleuron without anterodorsal bristle. Beret with 12 to 15 hairs. Hypopleuron in front of spiracle with 7 to 12 hairs none of which is bristle-like. Posterior spiracle moderately large, very little shorter than beret. Wing with apical 1/2 of last section of vein M_{1+2} curved rather strongly forward, apical width of cell R_{4+5} 1.9 × length of anterior crossvein; apex of M_{1+2} closer to wing tip than is apex of vein R_{4+5} and distinctly distad of level of apex of R_{4+5} (as in Fig. 138). Squamae pale brown to brown; haltere dull yellow. Legs black, extreme apices of femora, and tibiae except their apices, usually very obscurely dark reddish. Mid femur usually with a series of about 8 long fine anteroventrals and posteroventrals on basal half, in the ♂ from Hawaii with only 1 moderately strong anteroventral and 3 or 4 quite strong posteroventrals. Hind femur with an entire row of long anteroventrals which are very weak at base and become much stronger and usually a little shorter towards apex, with similar long weak posteroventrals on basal half.

Abdomen black basally and apically, posterior margin of tergite 2, all of tergites 3 and 4 and sometimes anterolateral angles of tergite 5 obscurely or rather distinctly dull orange-yellow in ground color, the tergites densely pale grey pollinose with following areas darker, usually orange-brown to blackish: tergite 2 except for narrow posterior margin dorsally and much broader margin laterally and ventrally and a narrow median line which expands broadly laterad on anterior part of tergite; a moderately broad median stripe on tergite 3 which does not quite reach the posterior margin, a pair of large submedian angulate spots which extend along length of tergite 3 and are almost twice as broad posteriorly as anteriorly, and a pair of large anteriorly-rounded lateral spots on posterior half of tergite 3; similar areas on tergite 4 but median stripe much narrower, submedian spots rounded and confined to posterior half of the tergite, and lateral spots smaller; usually an extremely narrow median line on tergite 5, a short stripe on either side of it, and a very obscure posterolateral spot. Terminalia (Fig. 142-145) as described above for genus.

♀. Similar to ♂ but abdomen not all yellow-orange, differing from ♂ as follows: Eye hairs shorter and sparser, rather variable. Front 0.46 head width at antenna, 0.27 head width at vertex; parafrontal at middle of front 2/5 width of frontal vitta, not extending mediad of orbital bristles; frontal vitta with a moderately distinct silvery-grey pollinose median stripe which begins at posterior end of ocellar triangle and narrows to a subacute point at anterior end of front. Front with 9 or 10 pairs of convergent orbitals which extend almost to anterior ocellus, those of lowest pair strong and others slightly weaker, and with 1 pair of short reclinate orbitals beside ocellar triangle; front also with many rather short hairs on its entire length, the hairs mediad, laterad and caudad of orbital

bristles, lateral hairs at midlength of front extending at least 2/3 of distance from orbital bristles to eye margin. Thorax with a pair of submedian anterior black stripes and a postsutural median black stripe which are always distinctly separated by the grey pollinose or yellowish-grey pollinose background, postsutural median stripe extending laterad to, and usually beyond, base of prescutellar acrostichal bristle; median black scutellar stripe narrower. Hairs of beret and of hypopleuron sometimes less abundant. Squamae whitish-yellow. Anteroventral and posteroventral bristles of mid and hind femora generally shorter and weaker, posteroventrals of mid femur weak but distinct, anteroventrals of hind femur moderately strong only towards apex. Abdomen black in ground color, grey pollinose, dark areas blacker and more distinct. Terminalia (Fig. 148): Similar to those of *hypocrita*, but tergite 8 with rounded shallow anterior emargination; sternite 6 slightly broader than long and with more abundant and longer apical setae; sternite 7 long and slender, with a dense cluster of straight setae at base of each posterior branch which do not extend onto membrane or to apex of the sclerite; each half of sternite 8 slightly shorter and broader and with distinctly stronger setae.

DISTRIBUTION. New Guinea (0-1900 m), Bismarck Arch., Micronesia, Hawaii; also Oriental, Ethiopian, Holarctic regions.

Type locality and type. Carniola (NW Yugoslavia). Type presumably lost.

SPECIMENS EXAMINED (BISHOP, BMNH, CNC, UZMC). NW NEW GUINEA: 1 ♂, Enaratoli, Wisselmeren, 1742 m, 12. VII. 1962, J. Sedlacek; 1 ♂, same locality, 1800-1900 m, 27. VII. 1962, Sedlacek; 3 ♀♀, Sacramega Village, W of Lake Anggi Giji, Vogelkop, 1850 m, 1. VIII. 1957, D. E. Hardy; 1 ♀, Irai R., N of Lake Anggi Giji, Vogelkop, 1850 m, 31. VIII. 1957, Hardy. NE NEW GUINEA: 1 ♀, Lae, VII. 1944, F. E. Skinner. BISMARCK ARCH.: 1 ♀, Lorengau, Manus I., 18. VI. 1962; 1 ♀, Rossum, Manus I., 35-125 m, 30. VI. 1959; 1 ♀, Talumalaus, Mussau I., 27. VII. 1962. BONIN IS.: 3 ♂♂, 4 ♀♀, Okimura, Haha Jima; 1 ♂, 1 ♀, Omura, Chichi Jima; 1 ♀, Ogirura, Chichi Jima; 1 ♀, Ani Jima, Chichi Jima grp.; 1 ♂, Tatsumi Wan, Chichi Jima. HAWAII: 1 ♂, Waimanalo, Oahu, 30. V. 1967, S. Shinonaga; 1 ♀, NE end Waianae Mts, Oahu, 427-610 m, 29. I. 1967, J. R. Vockeroth.

DISCUSSION. *Graphomyia maculata* of authors is either an extremely variable species or a complex of species. Zimin (1951) and Hennig (1955-64) give a detailed treatment of the Palaearctic forms which have been distinguished on the basis of differences in frontal width, leg color and bristling, mesonotal and abdominal pattern, and other characters. *G. tienmushanensis* Ouchi, 1939, is probably another of these forms. The late Dr J. G. Chillcott was of the opinion, after careful study of extensive material, that the Nearctic populations known as *maculata* were a complex of 9 distinct species. The Ethiopian *Graphomya melas* (Wiedemann), 1830, (treated by van Emden (1939) as a subspecies of *maculata*) is certainly a member of this complex, as are almost certainly some of the Neotropical species.

The differences between the forms here treated as the species *maculata* and *rufitibia* are discussed below under *rufitibia*. The Oriental and Pacific *maculata* I have seen show considerable variation; of the regional specimens the 2 most distinctive (with very narrow postsutural median thoracic stripe) are those from Hawaii. The species was first collected there in 1948 (Joyce, 1949) and the Hawaiian population is almost certainly derived from a population other than those in New Guinea and Micronesia. *G. maculata* is the only species of the subfamily Mydaeinae in Hawaii.

Graphomya rufitibia Stein

Graphomyia rufitibia Stein, 1918, *Ann. Hist.- Nat. Mus. Natn. Hung.* **16:** 147; 1919, *Nova Guinea* **13:** 200; Mackerras, 1932, *Proc. Linn. Soc. N. S. W.* **57:** 361; Kano & Shinonaga, 1965, *Illustrated Keys to Filth Flies of Japan, 406th Med. Labor., U.S. Army Med. Command, Japan*, p. 7.

Graphomya rufitibia, Hennig, 1955-64, *Fliegen Palaearkt. Reg.* **63:** 237.

Graphomya maculata rufitibia, Hardy, 1936, *Proc. R. Soc. Qd* **48:** 28.

Graphomya stipata rufitibia, Snyder, 1965, *Insects Micronesia* **13**(6): 317.

Graphomyia stipata rufitibia, van Emden, 1965, *Fauna India, Diptera* **7**(1): 550.

Length 6.7 to 7.8 mm. Very similar to *maculata*, differing as follows.

♂. Head with pollen of front, parafacial and cheek silvery-grey, without yellowish tinge. Frontal width as in *maculata* but frontal vitta narrower, at narrowest part of front slightly narrower than parafrontal; hairs of front slightly shorter and less abundant, laterad of orbital bristles in an irregular single row. Pollen of mesonotum and scutellum pale grey, without yellowish tinge. Mesonotum with black markings slightly less extensive than in paler specimens of *maculata*, median dark stripe always divided into 2 anterior submedian stripes and a posterior median one, latter usually not extending cephalad of the suture and extending laterad at most as far as bases of prescutellar acrostichal bristles. Lower squama yellowish-white. Terminalia as in *maculata*.

♀. Front with fine hairs less abundant, more restricted in distribution on parafrontal, at middle of front extending only halfway from orbital bristles to eye margin. Pollen of mesonotum and scutellum grey. Median postsutural dark stripe of mesonotum extending laterad at most to base of prescutellar acrostichal bristles. Terminalia as in *maculata*.

DISTRIBUTION. Micronesia, India, Australia, Taiwan; presumably also New Guinea and much of the Oriental region.

Type locality and types. Various localities in Formosa (Taiwan). Syntypes presumably in Zool. Mus., Berlin.

SPECIMENS EXAMINED (BISHOP). MICRONESIA: 3 ♂♂, Koror I., Palau, IV, VII, IX, 1953, J.W. Beardsley; 1 ♀, Airai, Ngarsung, Babelthuap I., Palau, 16. V. 1957, C.W. Sabrosky.

DISCUSSION. The status of this form is not yet clear. Specimens from Palau, Micronesia differ as indicated in the key and description above from the many specimens from Bonin Is., Micronesia referred by Snyder (1965), and in the present paper, to *maculata*. I have also examined 3 ♂♂, 4 ♀♀ from Coimbatore, S India (CNC) which agree well with the Palau specimens and differ as indicated above from 2 ♀♀ of *maculata* from Kodaikanal and Yercaud, S India (CNC). However, although Stein (1919b) recorded *rufitibia* from New Guinea, the few specimens of this complex I have seen from New Guinea all appear to be *maculata* rather than *rufitibia*. I have also examined 1 ♂ from Kaohsiung, Taiwan and 3♂♂ from Sydney, Brisbane and Cairns, Australia (CNC, BISHOP) which have the characters of *rufitibia*. However, a series of ♀♀ from Australia (1 ♀, Brisbane; 4 ♀♀, Cairns; 3 ♀♀, Babinda, N Qsld.; 2 ♀♀, Bundaberg, N Qsld.; 1 ♀, Bibra L. nr Perth, W. A.) (CNC, BISHOP), although agreeing generally in thoracic color and markings with the other ♀♀ of *rufitibia*, have the parafrontal

hairs rather more abundant, and in the ♀ from Brisbane they almost reach the eye margin. It seems probable that 2 species are involved with the ♂♂ differing consistently in the relative width of the frontal vitta and the parafrontals, and with the ♀♀ not always distinguishable, but I am not yet sure that this is the correct interpretation.

I have examined 1 ♂ from Chiapas, Mexico (CNC) which is very similar to the ♂♂ of *rufitibia* and is almost certainly conspecific with the Neotropical ♂♂ of *Graphomya stipata* Walker, 1856, discussed by van Emden (1965, p. 552). However, apart from the shorter and sparser hairs and bristles of the hind femur, more or less as described by van Emden, this ♂ has the legs black with the tibiae only faintly tinged with red, and has the front at its narrowest point slightly narrower than the ocellar triangle and with the frontal vitta reduced for a considerable distance to a barely visible line. I do not think it reasonable, on the basis of either morphology or distribution, to consider *rufitibia* as a subspecies of the Neotropical *stipata*.

Graphomya mediolinea Vockeroth, new species

Large species with dark obscurely striped thorax and with yellowish abdomen bearing an irregular broad black median stripe. Length 7.4 mm.

♂. Head black, most of parafrontal and upper part of cheek dark reddish, parafrontal subshining, not distinctly pollinose; parafacial, face, cheek and occiput slightly to moderately dark grey pollinose. Eye with long dense hairs below as well as above; upper anterior eye facets not noticeably enlarged. Front at narrowest point 1.25 × as wide as ocellar triangle, at this point parafrontal as wide as frontal vitta. Front with about 12 pairs of convergent orbitals on lower 3/4 of its length, those of lowest pair strong, others decreasing rather rapidly in length and strength so the upper pairs are almost hair-like, without reclinate upper orbitals, with many rather long fine hairs among orbital bristles and on either side of them and between upper orbitals and ocelli. Antenna black, segment 3 obscurely reddish at extreme base. Palpus dull yellow-orange, apex slightly brownish.

Thorax black, postcallus and scutellum very dark reddish; mesonotum and scutellum with obscure very dark blackish-grey pollen (darkness possibly due to wetting, but not obviously so) leaving an obscure pattern of black stripes very similar to that of *maculata* but with inner branch of sublateral stripe apparently extending narrowly to postcallus and with broad median stripe only very obscurely divided by a forked brownish-grey median stripe. Pleura with faint grey pollen which is weakest on mesopleuron and most of sternopleuron. Beret obscurely dark reddish. Posthumeral bristle absent; presutural bristle strong. Notopleuron with long fine hairs on most of its surface. Anterodorsal mesopleural bristle absent. Beret with about 20 long fine hairs; hypopleuron with about 10 hairs in front of spiracle none of which is bristle-like. Posterior spiracle large, as long as beret. Wing slightly brownish towards base, with apical 1/2 of last section of vein M_{1+2} curved rather strongly forward, apical width of cell R_{4+5} 1.3 × length of anterior crossvein; apex of M_{1+2} closer to wing tip than is apex of vein R_{4+5} and distad of level of apex of R_{4+5}. Squamae dull yellowish, lower lobe slightly darker apically and laterally; haltere yellow brown. Legs black, tibiae very obscurely dark reddish. Mid femur with very weak, hair-like and irregular anteroventrals on basal third, with a series of fine long posteroventrals on basal half. Hind femur with a complete row of long anteroventrals which become stronger towards apex, with a row of long hair-like posteroventrals on basal half.

Abdomen mostly pale dull yellow-orange, weakly and irregularly whitish-grey pollinose; tergite 1 black; tergites 2 to 4 with a broad black median stripe which is about 1/4 width of tergite on most

of 2 and 3 but broadens at about 3/4 length of each of these tergites and becomes about 2/3 width of tergite; on tergite 4 narrowed slightly from base to midlengeh of tergite, then abruptly broadened and narrowly confluent posterolaterally with a posterolateral blackish spot on each side of tergite; tergite 5 obscurely pale anterolaterally, with a broad black median stripe which broadens abruptly at about 1/3 length of tergite, otherwise obscurely blackish. Terminalia not examined.

♀. Unknown.

DISTRIBUTION. New Guinea.

Holotype ♂ (BISHOP 9615), Mt Giluwe, SE New Guinea, 2500 m, 7.VI.1963, J. Sedlacek.

DISCUSSION. This species is very different from the other regional species, none of which have the abdomen yellowish with a single irregular dark median stripe nor the eye of the ♂ with the hairs on the lower half long and dense as on the upper half. It is also the only regional species not known to occur at or near sea level.

LIST OF MYDAEINAE OF NEW GUINEA AND OCEANIA

Papuaia Malloch
- *curvinervis* (Stein) - New Guinea
- *immaculata* n. sp. - New Guinea
- *marginata* (Stein) - New Guinea
- *quadrisetosa* n. sp. - New Guinea
- *asternata* n. sp. - New Guinea

Gymnopapuaia n. gen.
- *albicornis* (Walker) - New Guinea
- *conformis* n. sp. - New Guinea
- (*hypopleuralis* (Malloch)) - Queensland
- *palau* (Snyder) - Micronesia
- *rufiscuta* n. sp. - Tanimbar Is.
- *solomonensis* n. sp. - Solomon Is.
- *clavipalpis* n. sp. - New Guinea, Bismarck Arch.
- *acuta* n. sp. - Bismarck Arch.
- *annulata* (Stein) - New Guinea
- *aquila* n. sp. - Bismarck Arch.
- *bicincta* (Stein) - New Guinea
- *decipiens* (Stein) - New Guinea
- *lativittata* n. sp. - New Guinea
- *multisetosa* n. sp. - New Guinea
- *quadristriata* (Stein) - New Guinea
- *unisetosa* n. sp. - New Guinea
- *clivata* n. sp. - New Guinea
- *laterohirta* n. sp. - New Guinea
- *sexvittata* n. sp. - New Guinea
- *precaria* n. sp. - New Guinea
- *marginisquama* (Stein) - New Guinea
- *diffidentia* n. sp. - New Guinea
- *brunneisquama* n. sp. - New Guinea
- *paula* n. sp. - New Guinea, Bismarck Arch.
- *feminina* n. sp. - New Guinea
- *magnicornis* n. sp. - New Guinea

Papuaiella n. gen.
- *ponti* n. sp. - New Guinea

Chaetopapuaia n. gen.
- *setifrons* n. sp. - New Guinea

Helinomydaea n. gen.
- *acrostichalis* n. sp. - New Guinea
- *punctiventris* n. sp. - New Guinea

Hebecnema Schnabl
- *rufula* n. sp. - New Guinea
- *infuscata* (Bigot) - New Caledonia
- *nigrita* n. sp. - New Guinea
- *gressitti* n. sp. - Solomon Is.

Myospila Rondani
- *laevis* (Stein) - New Guinea, Ternate I., Ceylon, India, Malaya, Philippines, Taiwan.
- *setosissima* n. sp. - New Guinea
- *setinervis* (Stein) - Bismarck Arch., Solomon Is.
- *flavipennis* (Malloch) - New Guinea, Bismarck Arch., Solomon Is., Malaya
- *squalens* (Walker) - New Guinea, Bismarck Arch., Amboina, Kai Is., Moluccas.
- *cincta* (Bigot) - New Guinea, Bismarck Arch., Ternate, Malaya
- *propinqua* (Stein) - New Guinea, Solomon

Is., Amboina
argentata (Walker) - New Guinea, Bismarck Arch., Solomon Is., n and w to India and Taiwan.
aureorufa n. sp. - Solomon Is.
fumidala n. sp. - Bismarck Arch.
novaehebudae n. sp. - New Hebrides
papuensis n. sp. - New Guinea
pallidibasis n. sp. - New Guinea
novaebrittaniae n. sp. - Bismarck Arch.
effeminata n. sp. - Fiji

Graphomya Robineau - Desvoidy
setifrons n. sp. - New Guinea, Bismarck Arch.
hypocrita n. sp. - Solomon Is.
opima n. sp. - New Guinea
eximia Stein - New Guinea
aurantioventris n. sp. - Bismarck Arch., Solomon Is.
maculata (Scopoli) - New Guinea, Bismarck Arch., Micronesia, Hawaii; also Oriental, Ethiopian, Holarctic regions.
rufitibia Stein - Micronesia, India, Australia, Taiwan; presumably also New Guinea.
mediolinea n. sp. - New Guinea

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New names are indicated by **bold face** type, synonyms by *italics*