

FLATIDAE OF SULAWESI, WITH NOTES ON SOME
RELATED PHILIPPINE AND INDOMALAYAN SPECIES
(HOMOPTERA: FULGOROIDEA)

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ABSTRACT. The flatid fauna of Sulawesi is reviewed, based partly on material from the 1985 Project Wallace Expedition in North Sulawesi, and partly on type specimens of previously named species. Related species from the Philippines and Indomalayan Region are included also. Seventeen genera and 46 species are treated, of which *Atracis crenata* and 6 genera and 16 species that follow are new: *Acutisha sulawesiensis*, *Lecopia alabasta*, *Lecopia extensa*, *Lecopia roseda*, *Microliza calixis*, *Microliza desiris*, *Microliza epicis*, *Miniscia adera*, *Miniscia decapita*, *Miniscia fortunata*, *Nullina nigrigans*, *Somisha conmela*, *Somisha dilura*, *Somisha imitacea*, *Somisha minica*, *Somisha retarda*.

New combinations proposed are: *Circumdaksha chloroleuca* (Walker) and *Circumdaksha labeculata* (Distant) from *Flata*, *Circumdaksha roseovenosa* (Melichar) and *Circumdaksha rubropunctata* (Melichar) from *Lechaea*, *Lecopia lurida* (Melichar) from *Sephena*, *Lecopia subjecta* (Walker) from *Nephesa*, *Lecopia uniformis* (Melichar) from *Poeciloflata*, *Somisha calochroma* (Walker) from *Poeciloptera*, *Somisha electa* (Melichar) from *Colgar*, *Somisha spumans* (Breddin) from *Nephesa*, *Miniscia maculata* (Melichar) from *Phlebopterum*.

New synonymies proposed are: *Circumdaksha rufosparsa* Distant, junior synonym of *Circumdaksha rubropunctata* (Melichar), *Flata erubescens* Breddin, junior synonym of *Poeciloflata viridana* (Donovan).

Lectotype male designations are: *Cerynia fulgida* Melichar, *Poeciloptera maria* White, *Sephena lurida* Melichar. Neotype male designations are: *Poeciloptera calochroma* Walker, *Poeciloptera producta* Spinola. *Lechaea* Stål is restricted as a monotypic genus, status nov.

Original keys to genera and species, descriptions, measurements, and illustrations of male genitalia are given to help with identification of species. An alphabetical list of genera and species serves as index.

Introduction

This report is based in part on 106 specimens of Flatidae collected in Northern Sulawesi in 1985 during the expedition sponsored jointly by the Royal Entomological Society of London and the Indonesian Institute of Sciences.

Also reviewed here are type specimens of most species described from Sulawesi, including those named by Distant, Melichar, Walker, and Stål that represent 75 percent of the 25 species recorded from Sulawesi in the Metcalf Catalog, 1957. Species named by Walker were based on material collected by Alfred Russel Wallace. Species described by Melichar were based on specimens sold to several European museums by Hans Fruhstorfer, who collected in Sulawesi during 1895-96.

Knight (1988) reported on objectives, administration, logistics, participants and scientific programs of Project Wallace. Information on collecting sites in Dumoga-Bone National Park that was given by Heppner (1989) in relation to research on Lepidoptera diversity is applicable also to records on flatids.

The Project Wallace collections greatly augmented my research on Indomalayan Flatidae already in progress for several years, during which period the type specimens of most species named by earlier workers had been examined. The Project Wallace data were valuable with respect to recognition and descriptions of 6 new

genera and 17 new species, elucidation of several poorly understood taxa, and substantial new information on distributions and affinities of the fauna. In large part my taxonomic study is based on diagnostic characters of the head, tegmina and genitalia, such as described and illustrated by Medler (1989). Original collection data are transcribed exactly as given on labels. Where necessary, updating of locality names is indicated by brackets [].

Sulawesi is of particular interest because this geographical region apparently is the center of diversity of several unusual generic complexes in the Flatidae. Female specimens in these genera (1-10 listed below) are easily differentiated from those in other taxa by their uniformly elongate-oval anal segment X (wax plate), and modified ovipositor consisting of small lobelike non-sclerotized valvulae I and reduced valvulae III lacking marginal spines or teeth. My use of these terms may be equated with gonopophyses VIII and lateral gonopophyses IX, sensu Müller, 1942. The normally truncated head shows modified development of the frons and vertex, with the latter apparently replaced dorsally by convex extension of the frons without visible separation from a "vertex." In such cases the margin of the frons/vertex appears to be a distinct transverse suture connecting the dorsal margins of the genae above the eyes. The precise relationship of the frons/vertex and triangular plates adjacent to the eyes on posterior margin of the head was not studied. Metatibiae may bear either 0, 1 or 2 lateral spines.

Methods

Measurements were made on type specimens or specimens selected as plesiotypes. The overall length was measured with a mm ruler, and all other measurements were made at 3x with a binocular microscope fitted with a 20 x 20 grid in a 15x eyepiece. Grid units were then converted to mm. Data on the character states are presented in uniform sequence, as follows: Length - overall in side view along the midline from anterior margin of head to apical margin of tegmen; vertex (v) dorsally along midline from transverse posterior carina to anterior margin; frons (f) medially from frontoclypeal suture to margin with vertex; pronotum (p) and mesonotum (m) along longitudinal midline; tegmen (t) from origin of basal stem to middle of apical margin; postclaval sutural margin (pcl) from apex of clavus to tip of sutural angle, or if sutural angle convex, then from intersection of apical margin along a chord projected from preclaval sutural margin through apex of clavus. Precise points used for pcl measurement are shown in Fig. 32. Width - vertex (v) transversely along the basal carina between its junction points with lateral carinae dorsal to eyes; frons (f) at the maximal point; tegmen (t) between apex of clavus and costal margin.

The hind leg spines are recorded by formula, with data listed in sequence of (1) metatibial lateral spine, (2) metatibial apical spines, (3) metatarsal basal segment apical spines: e.g. 1:5:7.

Genitalia drawings were made freehand from NaOH-treated specimens positioned in glycerine in a porcelain spot plate. Accurate dimensions were obtained with the same 20 x 20 grid used for measurements.

Depository Museums

The following acronyms are used to identify museums that provided specimens for study and served as depositories for type materials:

- AM = Amsterdam Museum, Amsterdam, Netherlands.
 BMNH = Natural History Museum, London, England.
 BPBM = Bishop Museum, Honolulu, Hawai'i, USA.
 DSMT = Dresden Staatliches Museum für Tierkunde, Dresden, East Germany.
 EBER = Akademie der Landwirtschaftswissenschaften der DDR, Abt. Taxonomie der Insekten, Eberswalde-Finow, East Germany.
 HAMB = Universität Hamburg Zoologisches Institut und Zoologisches Museum, Hamburg, West Germany.
 HNHM = Hungarian Natural History Museum, Budapest, Hungary.
 IRSN = Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.
 LIPI = Indonesian Institute of Sciences, Museum Zoologicum Bogoriense, Bogor, Indonesia.
 MNHN = Muséum National d'Histoire Naturelle, Paris, France.
 MNHU = Museum für Naturkunde der Humboldt Universität, Berlin, East Germany.
 MZN = Museo di Zoologia di Napoli, Naples, Italy.
 NCSU = North Carolina State University, Raleigh, North Carolina, USA.
 NMWZ = National Museum of Wales, Zoology, Cardiff, Wales.
 NRS = Naturhistoriska Riksmuseet, Stockholm, Sweden.
 RNHL = Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.
 SCU = Biology Department, University of San Carlos, Cebu City, Philippines.
 USNM = National Museum of Natural History, Washington, DC, USA.
 VSCA = Visayas State College of Agriculture, Baybay, Leyte, Philippines.
 WIEN = Naturhistorisches Museum, Vienna, Austria.

Key to genera of Flatidae in Sulawesi

1. Hind tibiae each with one or two lateral spines 2
 Hind tibiae without lateral spines. Small (8 mm), dark specimen without submarginal line of crossveins 9. *Nullina*, gen. nov.
2. Antennal segment I extensible beyond lateral margin of frons, segment II with deep groove lengthwise on outer surface 15. *Cerynia* Stål
 Antennal segment I not extending beyond lateral margin of frons, segment II not grooved. 3
3. Claval vein A2 strongly elevated basally; postclaval sutural margin convexly raised. Small specimen colored brown or black. 4

- Clavus veins not elevated. Specimen not as described above 5
4. Head truncate anteriorly in dorsal view; 1 metatibial lateral spine
 17. **Microliza**, gen. nov.
 Head conical anteriorly in dorsal view; 2 metatibial lateral spines
 16. **Seliza** Stål
5. Head acutely conical; tegmen with sutural angle acutely pointed, apical margin
 nearly truncate 6
 Head not conical; tegmen usually with apical margin convex 9
6. Two longitudinal veins (R+S, M) arising from basal node 7
 Three longitudinal veins (R,S,M) arising from basal node 8
7. Vertex with median longitudinal carina . . . 13. **Phyllyphanta** Amyot & Serville
 Vertex without median carina 12. **Salurnis** Stål
8. Two metatibial lateral spines 14. **Cromna** Walker
 One metatibial lateral spine 6. **Acutisha**, gen. nov.
9. One metatibial lateral spine 10
 Two metatibial lateral spines 13
10. Tegmen with 3 longitudinal veins (R, S, M) arising from basal stem; tegmina held
 vertically 11
 Tegmen with 2 longitudinal veins (R+S, M) arising from basal stem; tegmina of-
 ten extended laterally 12
11. Anterior margin of head truncate or slightly convex. Apical margin of tegmen
 oblique, the costal and sutural angles dissimilar, convex
 7. **Sabaethis** Jacobi
 Anterior margin of head produced obtusely. Apical margin of tegmen truncate, or
 nearly so, sutural angle acute or at 90 degrees
 5. **Somisha**, gen. nov.
12. Vertex elongated; pronotum without postocular eminence; mesonotum strongly
 elevated convexly above pronotum 11. **Cerfennia** Stål
 Vertex not longer than wide; pronotum with nipplelike postocular eminence;
 mesonotum not strongly convex anteriorly 10. **Atracis** Stål
13. Well defined margin between frons and vertex; frons concave between raised
 lateral edges 8. **Miniscia**, gen. nov.
 Without margin between vertex and frons; frons no more than slightly depressed
 between lateral edges 14
14. Apex of tegmen with submarginal line of crossveins. Frons in profile strongly an-
 gulate, bituberculate midway between clypeus and dorsum. Length more
 than 15 mm. 1. **Lechaea** Stål
 Apex of tegmen without submarginal line; frons not bituberculate 15
15. Lateral carinae of frons shallowly convex in profile; pronotum with elevated pos-
 tocular eminence. Length less than 15 mm 4. **Lecopia**, gen. nov.
 Lateral carinae of frons obtusely angulate in profile; pronotum without pos-
 tocular eminence. Length 17 mm or more 16
16. Tegmen with oblique crossvein and large black spot between veins Cu and M
 3. **Poeciloflata** Melichar
 Tegmen without oblique crossvein and large black spot
 2. **Circumdaksha** Distant

Tribe PHROMNIINI Distant

1. Genus *Lechaea* Stål

Lechaea Stål, 1866a: 236 [gen. nov., in key]; Metcalf, 1957: 70 [catalog].

Type species: *Poeciloptera dentifrons* Guérin-Méneville, subsequent designation by Stål, 1866b: 393.

Diagnosis: Head modified, frons strongly angulate about midway between clypeus and transverse carina extending between dorsal margins of genae above eyes, basal part nearly horizontal, dorsal part oblique, margin between with pair of subconical projections; ocelli small. Pronotum tricarinate, lateral carina sharp, downturned convexly, postocular eminence represented by median carinate ridge extending to ventral margin of lateral pronotal lobe. Tegmen elongate oval, more than twice longer than wide, longitudinal veins R, S, and M multiforked, producing dense array of terminal veins, strong network of crossveins apically, submarginal line of crossveins distinct, about 1 mm inside of postclaval and apical margins, indistinct along costal angle.

Female segment X (wax plate) elongate oval; valvulae I modified, small non-sclerotized median lobe; valvulae III reduced in size, margins without spines or teeth. Metatibial preapical lateral spines: 2.

Distribution: Indomalayan Region.

Taxonomic note: *Lechaea* Stål is here restricted as a monotypic genus, status nov.

1.1. *Lechaea dentifrons* (Guérin-Méneville)

Poeciloptera dentifrons Guérin-Méneville, 1844: 360 [sp. nov.]; Medler, 1988: 13, Fig. 2, 1 [holotype female; plesiotype male genitalia illustrated]. Holotype: female, MALACCA (MZN). Plesiotype: male, MALAYA, Bentong (BMNH).

Lechaea dentifrons: Stål, 1866b: 393 [combined]; Melichar, 1901: 232, pl. 3, Fig. 2 [illustrated]; Metcalf, 1957: 70 [catalog].

Diagnosis: Overall color sordid or ivory white, mesonotum laterally with large red orange spot, pro-, mesotibiae and tarsi infuscated. This species is easily recognized by comparison with illustrations of Melichar, 1901, pl. 3, Fig. 2, and male genitalia figured by Medler, 1988a, pl. 2, Fig. 1.

Measurements (plesiotype M, holotype F). Length: Overall 21.0, 25.0; v 1.33, 1.74; f 2.32, 2.49; p 1.08, 1.33; m 3.65, 3.82; t 16.43, 23.50; pcl 3.98, 6.00. Width: v 1.41, 1.49; f 2.08, 2.49; t 8.96, 11.00. Hind leg spine formula: both 2:7:8.

Specimens examined: Not collected during Project Wallace. Not known from Sulawesi. MALAYSIA: Malacca, holotype F (MZN); Malaya, plesiotype M (BMNH); BORNEO: (no data) (BMNH); MALABAR: (? mislabeled) (WIEN).

2. Genus *Circumdaksha* Distant

Circumdaksha Distant, 1910: 328 [gen. nov.]; Metcalf, 1957: 153 [catalog].

Type species: *Circumdaksha rufosparsa* Distant, 1910, monotypic, junior synonym of *Lechaea rubropunctata* Melichar, 1901.

Diagnosis: Frons strongly convex, delimited dorso-posteriorly by transverse carina originating at margins of genae dorsad from eyes; elevated lateral carinae obtusely angulate in profile view, faint remnants dorsally of U-shaped and median carinae; ocelli small; pronotum without postocular eminence. Tegmen wide, broadly convex apically, R, S, and M veins multibranching, about 80 to 90 terminal veins at apical margin, cell between veins S and M wide, M with 6-7 branches basal of disc, strong network of crossveins apical of disc but no submarginal line, weakly developed crease or pigmented line in membrane extending diagonally from apex of clavus nearly to costal margin, cell between veins M and Cu wide, no oblique cross vein, other crossveins grouped at pigment spots.

Female segment X (wax plate) elongate-oval; valvulae I modified, small, non-sclerotized lobe; valvulae III reduced in size, margins without spines or teeth. Spread width: 45 - 55 mm. Metatibial preapical lateral spines: 2.

Distribution: Sulawesi.

Key to species of *Circumdaksha*

1. Tegmen with about 10 large yellowish-orange spots that mark aggregations of 3-4 strong cross veins, diagonal crease unmarked if present
 **C. labeculata** (Distant)
 Tegmen without large yellowish orange spots as described, usually cell C and disc of tegmen each with lengthwise row of at least 3 red or reddish purple spots; or membrane with crease outlined in red extending diagonally from claval apex to near costal margin 2
2. Tegmen with 2 rows of spots aligned lengthwise 3
 Tegmen without alignments of spots; apical crease outlined by red
 **C. roseovenosa** (Melichar)
3. Spots on tegmen red **C. rubropunctata** (Melichar)
 Spots on tegmen dark reddish purple, apical crease outlined in purple
 **C. chloroleuca** (Walker)

2.1. *Circumdaksha labeculata* (Distant), comb. nov. (Fig. 2)

Flata labeculata Distant, 1892: 284 [sp. nov.]; Medler, 1990a: 46, Fig. 58 [holotype male genitalia illustrated]. Holotype: male, Celebes [SULAWESI], Minahasa (BMNH).

Lechaea labeculata: Metcalf, 1957: 71 [catalog].

Lechaea aurantiomaculata Melichar, 1901: 234, pl. 6, Fig. 11 [spec. nov., illustrated]; Metcalf, 1957: 70 [catalog]. Medler, 1990a: 46 [synonymized]. Holotype: female, Celebes [SULAWESI], Tolitoli (EBER). Plesiotype: male, Celebes [SULAWESI], Minahasa (AM), here designated.

Diagnosis: Morphological characters same as given for genus, markings as given in key. Genital characters of *Lechaea labeculata* (Distant) holotype were illustrated by Medler, 1990a, Fig. 58. The same genital characters were found in the plesiotype of *Lechaea aurantiomaculata* Melichar (Fig. 2), thereby confirming synonymy proposed by Medler, 1990a.

Measurements (*labeculata* holotype M, *aurantiomaculata* plesiotype M, *aurantiomaculata* holotype F). Length: Overall 27.5, 28.0, 33.0; v 0.66, 0.75, 1.16; f 2.16, 2.16, 2.16; p 0.91, 0.83, 1.00; m 4.15, 3.32, 4.15; t 22.41, 21.58, 26.0; pcl 4.15, 5.81, 6.00. Width: v 1.37, 1.25, 1.33; f 1.66, 1.49, 1.66; t 13.28, 12.45, 15.00. Hind leg spine formula: 2:5:6, 2:5:6, 2:5:5.

Specimens examined: Not collected during Project Wallace. SULAWESI UTARA: Minahasa, holotype M, BMNH; plesiotype M, F, Minahasa, MacGillavry coll.(AM); F, Minahasa (NRS); Tolitoli, holotype F (EBER).

Taxonomic note: Minahasa is not a specific place, but a name applied in general to the northeastern peninsula of Sulawesi Utara.

2.2. *Circumdaksha chloroleuca* (Walker), comb. nov. (Fig. 1)

Flata chloroleuca Walker, 1870: 180 [sp. nov.]; Medler, 1990a: 11 [holotype male]. Holotype: male, Celebes [SULAWESI], Mak [Makassar] (BMNH).

Pociloflata chloroleuca: Metcalf, 1957: 65 [catalog].

Diagnosis: The 6-9 round spots and postdiscal crescent band on tegmen deep reddish purple, contrasting strongly with white, wax-dusted membrane. Median carina of frons black dorsally. Aedeagus of holotype apically with distinctive elongate triangular plate (fig.1) as found throughout the genus.

Measurements (holotype M). Length: Overall 22.0; v 0.83; f 1.91; p 0.91; m 3.32; t 17.93; pcl 4.32. Width: v 1.37; f 1.74; t 11.29. Hind leg spine formula: 2:5:7.

Specimens examined: Not collected during Project Wallace. SULAWESI: Makassar, holotype M (BMNH); W. SUMATRA: Lebong Tandai, M, 1920-23 (C.J. Brooks), BM 1936-681 (BMNH).

Taxonomic note: Walker's original publication gave the locality of *F. chloroleuca* as "Makian; Celebes". The type specimen examined by Medler (1990a: 11) had labels "Mak, Celeb/Wallace". MAK actually referred to Makassar [Ujung Padang, SULAWESI], not Makian. Since Walker's original description the pale green tegmen with deeper green patch basally has faded, except the bulla has persisted faintly green. The dots and curved apical streak described as black are actually deep reddish purple.

2.3. *Circumdaksha rubropunctata* (Melichar), comb. nov.

Lechaea rubropunctata Melichar, 1901: 234 [sp. nov.]; Metcalf, 1957: 71 [catalog]; Medler, 1986c: 52 [holotype female]. Holotype: female, Celebes [SULAWESI] (MNHU).

Circumdaksha rufosparsa Distant, 1910: 328, pl. 22, Fig. 7 [sp. nov., illustrated]; Metcalf, 1957: 153 [catalog]; Medler, 1990a: 54, Fig. 69 [holotype male genitalia illustrated]. Holotype: male: Makassar, [SULAWESI], Malay Archipelago [sic], (BMNH). Syn. nov., here designated.

Diagnosis: Arrangement of red spots on tegmen pictured by Distant, 1910, Fig. 7, and male genital characters shown by Medler, 1990a, Fig. 69, enable recognition of this species.

Measurements (*C. rufosparsa* holotype M, *L. rubropunctata* holotype F). Length: overall 24.0, 26.0; v 1.00, 1.00; f 1.99, 2.32; p 1.00, 1.00; m 2.99, 3.32; t 18.26, 20.00; pcl 4.98, 6.00. Width: v 1.45, 1.66; f 1.74, 2.16; t 9.96, 10.50. Hind leg spine formula: 2:5:7; 2:5:-.

Specimens examined: Not collected during Project Wallace. SULAWESI: holotype F (MNHU). SULAWESI SELATAN: Makassar [Ujung Padang], holotype M (BMNH).

2.4. *Circumdaksha roseovenosa* (Melichar), comb. nov.

Lechaea roseovenosa Melichar, 1901: 233, pl. 6, Fig. 12 [sp. nov., illustrated]; Metcalf, 1957: 71 [catalog]. Holotype: female, C. Celebes [SULAWESI TENGAH], Kalaena Ebene, (EBER).

Diagnosis: Pattern of tegmen markings illustrated by Melichar, 1901, Fig. 12. Veins and crossveins red basally, curved crescent and associated dots apically in tegmen also red; no indication of round spots aligned lengthwise in 2 rows. Abdomen red laterally.

Measurements (holotype F). Length: overall 26.0; 1.00; f 1.99; p 1.04; m 3.65; t 21.5; pcl 6.0. Width: v 1.45; f 1.83; t 12.0. Hind leg spine formula: 2:5:7.

Specimens examined: Not collected during Project Wallace. SULAWESI: holotype F (EBER).

3. Genus *Poeciloflata* Melichar

Poeciloflata Melichar, 1901: 235 [gen. nov.]; Metcalf, 1957:65 [catalog].

Type species: *Cicada modesta* Donovan, subsequent designation by Melichar, 1923: 321.

Diagnosis: Frons convex, dorsally not differentiated from vertex, delimited postero-dorsally by transverse carina connecting genal margins above eyes; median longitudinal carina extending about 0.75 length of frons, lateral carinae sharp, elevated. Pronotum without postocular eminence, dorsum sloping between head and mesonotum, the latter elevated anteriorly, strongly convex; median longitudinal carina, or trace of carina, extending from apex of head to scutellum, lateral carinae on mesonotum not developed. Apical margin of tegmen broadly convex, costal and sutural angles convex; 3 longitudinal veins rising from basal stem (R,S,M), veins S and M forked so that disc is crossed by 3 and 10-12 branches respectively; terminals numerous, many crossveins in apical area, not aligned as submarginal crossvein; vein Cu not extending closely alongside claval suture, M-Cu oblique vein marked by large black spot rimmed with orange. Female segment X (wax plate) elongate oval; valvulae I small non-sclerotized median lobe; valvulae III reduced in size, margins without spines or teeth. Metatibial preapical lateral spines: 2.

Distribution: Sulawesi.

Key to species of *Poeciloflata*

- Apical margin of tegmen evenly convex at both angles; membrane uniform in color, sometimes with faded wide tawny bands. Aedeagus with dorsal apical spine; tooth of style pointed **P. modesta** (Donovan)
- Apical margin of tegmen oblique, sutural angle obtuse, membrane apically with with 3 red broad cross bands, these sometimes faded. Aedeagus without dorsal spine apically, tooth of style blunt **P. viridana** (Donovan)

3.1. *Poeciloflata modesta* (Donovan)

Cicada modesta Donovan, 1805: (2, pl. 1, Fig. 4) [sp. nov., illustrated]. Type: Syntype(s) not found. Donovan collection sold at auction by Stevens and dispersed, according to Horn and Kahle, 1936.

Poeciloflata modesta: Metcalf, 1957: 66 [catalog].

Poeciloptera combinata Walker, 1858: 110 [sp. nov.]; Medler, 1990a: 11 [lectotype female designated]. Lectotype: female, Celebes [SULAWESI] (BMNH).

Flata combinata: Stål, 1862b: 490 [synonymized].

Poeciloflata viridana luteofasciata Melichar, 1901: 236 [var. nov.]; Metcalf, 1957: 68 [catalog]; Medler, 1986b: 114, Fig. 4 [holotype male genitalia illustrated, synonymized]. Holotype: male, S. Celebes [SULAWESI SELATAN], Samanga (HNHM).

Diagnosis: Usually sordid white or stramineous, tegmen dusted with white waxy powder, conspicuous large black spot basally. Sometimes tegmen crossed by 3 obscure tawny bands apically, and in such cases, examination of male genitalia may be required for precise determination.

Specimens examined: SULAWESI UTARA: Dumoga-Bone National Park: Clark's Camp, 1,140 m, at light, F, 20.IV.1985, (Martin), BMNH 1985-10; Manado, Sta. 007, 2 M, F, X.1985, (Bosmans & Van Stalle), IRSN 29.977. SULAWESI SELATAN: Samanga, holotype M (HNHM); Malino, Sta. 60, 60 km E Ujung Padang, 1,000 m, 2 M, 2 F, 2-3.IV.1985, Duffels (AM). SULAWESI: lectotype F (BMNH).

3.2. *Poeciloflata viridana* (Donovan)

Cicada viridana Donovan, 1805: 1 (pl. 1, Fig. 3) [sp. nov., illustrated]. Type: Syntype(s) not found. Horn and Kahle, 1936, reported Donovan collection sold at auction by Stevens and dispersed.

Poeciloptera viridana: Metcalf, 1957: 67 [catalog].

Poeciloptera helena Walker, 1858: 110 [spec. nov.]; Stål, 1862b: 490 [synonymized]; Medler, 1990a: 19 [lectotype female designated]. Lectotype: female, Celebes [SULUWESI], 55/22 (BMNH).

Poeciloptera helena var.: Walker, 1858: 110 [var. nov.]. Type: Syntypes a-c not found.

Flata viridana erubescens Breddin, 1900: 199 [nom. nov.].

Poeciloflata viridana var. *erubescens*: Metcalf, 1957: 67 [catalog].

Flata erubescens, junior synonym of *Cicada viridana* Donovan, syn. nov., here designated.

Poeciloflata viridana testacea Melichar, 1901: 236 [nom. nov.]; Metcalf, 1957: 68 [synonymized].

Diagnosis: Oblique apical margin of tegmen and strong infusion of red in veins and oblique crossbands help distinguish this species from *modesta*. Color variation ranged from faded, nearly colorless forms to specimens strongly marked with deep red. No differences were found in genitalia of male variants.

Specimens examined: SULAWESI UTARA: Dumoga-Bone National Park: M, II.1985, Duffels (AM); F, 7.IV.1985; M, VI.1985; lowland forest, 200-300 m, M, X.1985; Hog's Back Camp, lowland forest, 492 m, M, XI.1985; Danau Mooat, nr. Kotamobagu, 1,200 m, M, 20-22.X.1985 (unidentified collector), BMNH 1985-10; Lake Mala [0°44'N, 124°27'E], 1,000 m, light trap sample forest, M, 10.IX.1985 (Kirk-Spriggs), NMWZ 1985-078; River Tumpah, Sta. 052, F, X.1985; Picnic Site, 250 m, Sta. 009, M, X.1985; Hog's Back Subcamp, 660 m, Sta. 095, M, 15.XI.1985; Danau Mooat (The Lakes), Sta. 059, M, 28.X.1985, (Bosmans and Van Stalle) IRSN 26.977. Minahasa, F, 1898 Noualhier coll. (var *testacea*, det. Melichar) (MNHN). SULAWESI: (no data), lectotype F (BMNH).

Tribe NEPHESINI Melichar

4. Genus **Lecopia** Medler, gen. nov.

Type species: *Lecopia extensa* Medler, here designated.

Diagnosis: Frons convex, median longitudinal carina 0.5 its length, lateral margins carinate, not strongly elevated, dorsal margin delimited by transverse carinae connecting genal margins above eyes; vertex not differentiated from frons. Pronotum with shallow conical postocular eminence, pro- and mesonotum raised above head only slightly, mesonotum strongly convex anteriorly, weakly tricarinate, disc convex. Tegmen convex apically, 3 longitudinal veins (R, S, M) rising from basal stem, veins multibranched, about 40 terminals, of which many are Y-branched at apical margin, without submarginal line of crossveins, usually shallow crease curving across tegmen from near claval apex. Vein Cu not running closely alongside claval suture (no cell), extending beyond claval apex to form narrow cell along postclaval sutural margin enclosing 10-12 crossveins. Female segment X (wax plate) elongate oval; valvulae I modified, small non-sclerotized median lobe; valvulae III reduced, margins without spines or teeth. Metatibial preapical lateral spines: 2.

Distribution: Sulawesi, Borneo.

Key to species of *Lecopia*

1. Tegmina unicolorous pink, white or white with stramineous veins basally . . . 2
Tegmina not white or pink; usually green or stramineous 3
2. Tegmina unicolorous pink. **L. roseda** Medler, sp. nov.
Tegmina white or mostly white (Muna Is) **L. alabasta** Medler, sp. nov.
3. Postclaval sutural margin curved convexly into apical margin 4
Postclaval sutural margin meeting apical margin at a right angle or nearly so;
margins of tegmen red from claval apex to costal margin
. **L. lurida** Melichar)

4. Head, thorax and tegmina uniformly stramineous 5
 Head and thorax differing in color from tegmina, precostal margin of tegmen narrowly blue green or white **L. *extensa*** Medler, sp. nov.
5. Apical margin of tegmen strongly oblique; 10-12 crossveins terminating along postclaval sutural margin **L. *uniformis*** (Melichar)
 Apical margin of tegmen shallowly convex; 4-6 crossveins terminating along postclaval sutural margin **L. *subjecta*** (Walker)

4.1. ***Lecopia extensa*** Medler, sp. nov. (Fig. 4)

Diagnosis: Morphology same as given for genus. Head, thorax and legs stramineous, tegmina strongly dusted with white waxy powder, underlying color usually green, sometimes ochraceous, precostal margin blue green or ivory white. Faded green or stramineous specimens show remains of precostal contrasting color pattern. Some paratypes show diffuse pink margin from claval apex to costal angle. Genitalia of holotype are illustrated (Fig. 4). Diagnostic character state of aedeagus is elongate curved dorsal process arising apically and directed basally. In some female specimens lateral margins of anal plate rolled inward, so that elongate oval shape is not readily apparent.

Measurements (holotype M, allotype F). Length: Overall 12.0, 13.25; v 0.25, 0.25; f 1.37, 1.49; p 0.50, 0.50; m 2.16, 2.32; t 9.96, 11.12; pcl 2.66, 3.32. Width: v 1.12, 1.16; f 1.41, 1.54; t 4.98, 5.81. Hind leg spine formula: both 2:5:5.

Holotype: Male, SULAWESI UTARA: Molosso Isl, Sta 102, 220-23.XI.1985, (Bosmans & Van Stalle), IRSN 29.977. Allotype: female, same label as holotype. Both deposited in IRSN. *Paratypes:* SULAWESI UTARA: Dumoga-Bone National Park: at light, 2 F, II.1985; M, VI.1985 (unknown collector); Toraut, nr base camp, ca 200 m, F, [no date] (Wilson), BMNH 1985-10; F, II (only data); at light, 660-1,140 m, M, IV-V.1985, (Martin) (LIPI); Toraut, nr base camp, ca 200 m, *Eugenia* sp. cf. *calucos*, woolly colony of green nymphs, M, F, (Martin No. 4632) (BPBM); Toraut, River Tumpah, on forest trail, 211 m, F, 31.VII.1985, (Kirk-Spriggs); light trap, sample forest, 492 m, F, 5.IX.1985, F, (Kirk-Spriggs), NMWZ 1985-078; Hog's Back Subcamp, 660 m, Sta. 018, F, X.1985; Molosso Isl, Sta. 102, 5 M, 3 F, 20-23.XI.1985; Molosso Isl, Sta 102, M, F, 20-23.XI.1985 (Bosmans & Van Stalle) (BPBM); Tangkoko National Park, Gunung Tangkoko, 50 m, Sta. 090, F, 10.XI.1985 (Bosmans & Van Stalle), IRSN 26.977.

4.2. ***Lecopia subjecta*** (Walker), comb. nov.

Nephesa subjecta Walker, 1870: 176 [sp. nov.]; Medler, 1990a: 35 [holotype designated].
 Holotype: [no abdomen], Celebes [SULAWESI], Mak [Makassar] (BMNH).
Sephena subjecta: Metcalf, 1957: 370 [catalog].

Measurements (holotype). Length: Overall 11.0; v 0.33; f 0.91; p 0.50; m 1.99; t 9.46; pcl 2.49. Width: v 1.04; f 1.41; t 5.15. Hind leg spine formula: 2:5:5.

Specimens examined: Not collected during Project Wallace. SULAWESI SELATAN: Makassar (Udjung Padang), holotype (BMNH). SULAWESI: (no data), M, Schutz coll. (HAMB).

Taxonomic note: "Makian; Celebes" was given by Walker as the type locality of *Nephesa subjecta*. The holotype bears label "Mak, Celeb/Wallace". Abbreviation MAK used by Wallace actually referred to Makassar, not Makian, which is a small island off the West coast of Halmahera.

4.3. *Lecopia uniformis* (Melichar), comb. nov. (Fig. 3)

Poeciloflata uniformis, Melichar 1901: 236 [sp. nov.]; Metcalf, 1957: 66 [catalog]; Medler, 1986b: 115, Fig. 6 [lectotype male designated; genitalia illustrated]. Lectotype: male, Borneo [SABAH]: Kudat (HNHM).

Diagnosis: Color uniformly tawny stramineous; tegmen with postdiscal crescent-shaped crease from near claval apex to costal angle; costal and sutural angles convex. Genitalia of the lectotype figured by Medler (1986c: 115, Fig. 6.), and genitalia of a paralectotype from Tolitoli (Fig. 3) represent the same taxon.

Measurements (paralectotype M, Tolitoli). Length: Overall 12.5; v 0.29; f 1.49; p 0.58; m 2.32; t 10.96; pcl 2.66. Width: v 1.20; f 1.58; t 4.93. Hind leg spine formula: 2:5:5.

Specimens examined: Not collected during Project Wallace. SULAWESI UTARA: Tolitoli, paralectotype M (HNHM). SULAWESI SELATAN: Samanga, M, XI.1895 (Fruhstorfer) (*rufomarginata* det. Melichar), (HNHM); Makassar, M, F, Rippon coll. NMWZ 1918-93. BORNEO: Kudat, lectotype M (HNHM).

4.4. *Lecopia roседа* Medler, sp. nov. (Fig. 7)

Diagnosis: Color of body and tegmen uniformly rosy red or pink, or tegmina reddish orange basally. White waxy powder may dust tegmina of some specimens. Holotype genitalia are illustrated (Fig. 7).

Measurements (holotype M, allotype F). Length: Overall 11.0, 14.0; v .0.17, 0.33; f 1.49, 1.66; p 0.50, 0.58; m 2.16, 2.66; t 9.46, 11.79; pcl 3.32, 3.65. Width: v 1.16, 1.33; f 1.45, 1.74; t 4.65, 5.81. Hind leg spine formula: 2:5:6, 2:5:6.

Holotype: male, SULAWESI UTARA: Dumoga-Bone National Park: VI.1985, BMNH 1985-10; Allotype: female, Toraut, III.1985 (Martin No. 4632) BMNH 1985-10. Each in BMNH. Paratypes: SULAWESI UTARA: Dumoga-Bone National Park: Toraut, nr base camp, ca 200 m, *Eugenia* sp. cf. *calucos*, woolly colony of pale green nymphs, 5 M, 3 F, III.1985, (Martin No. 4632), BMNH 1985-10; Toraut, M, F, III.1985, same label data as above, (Martin #4632) (LIPI); Toraut, M, F, III.1985, same label data as above, (Martin #4632) (BPBM); Toraut, base camp, at light, ca 200 m, M, V.1985, (Wilson); Edward's Camp, 664 m, F, 12.IV.1985 (Martin) BMNH 1985-10; Hog's-Back Subcamp, 660 m, Sta. 018, M, X.1985; F, Sta. 095, 15.XI.1985 (Bosmans & Van Stalle), IRSN 26.977.

4.5. **Lecopia alabasta** Medler, sp. nov. (Fig. 5)

Diagnosis: Uniformly pale white color, distribution restricted to Muna Island, and diagnostic characters of holotype male genitalia (Fig. 5) serve to distinguish this species. The slender ventral aedeagal process that extends from basal attachment to beyond apex of aedeagus is unique in the genus.

Measurements (holotype M (headless), allotype F). Length: Overall 10.0, 11.0; v ..., 0.25; f ..., 1.33; p 0.33, 0.50; m 1.83, 1.99; t 7.47, 8.80; pcl 2.49, 2.49. Width: v ..., 1.08; f ..., 1.37; t 4.15, 4.48. Hind leg spine formula: 2:5:5, 2:5:6.

Holotype: Male, Celebes [SULUWESI SELATAN]: Raha, Moena Isl [Muna Isl, 5°00'S, 122°30'E], 10.VIII.1939, H. Boschma; Allotype: female, same label as holotype. Each in RNHL. Paratypes: same label as holotype, 4 F (RNHL); F (BPBM).

Distribution: Not collected during Project Wallace. Known only from the type specimens.

4.6. **Lecopia lurida** (Melichar), comb. nov. (Fig. 6)

Sephena lurida Melichar, 1902: 128 [sp. nov.]; Metcalf, 1957: 368 [catalog]; Medler, 1986b: 114 [syntype not found]; Medler, 1987: 39, Fig. 5 [lectotype male designated in error, genitalia illustrated]. Lectotype: male, S. Celebes [SULAWESI SELATAN]: Bua-Kraeng, 5,000' [1,524 m], Feb. 1896, (H. Fruhstorfer) (det. *rufomarginata* Melichar) (HNHM), here designated.

Diagnosis: Body and tegmina stramineous, somewhat paler on disc of tegmen due to thin deposit of white powdery wax. Tarsi and apex of tibiae rosy red. Tegmen strongly red along postclaval sutural margin, apical margin and costal margin, with the latter red progressively diminished and lost before reaching base of tegmen. The angular shape of the sutural angle, slightly oblique and nearly truncate apical margin, and short convex costal angle help distinguish *L. lurida* from other species in the genus. Lectotype male genitalia are illustrated (Fig. 6).

Measurements (lectotype M). Length: Overall 10.0; v 0.25; f 1.25; p 0.54; m 1.91; t 8.47; pcl 3.65. Width: v 0.95; f 1.29; t 4.81. Hind leg spine formula: 2:5:5.

Specimens examined: Not collected during Project Wallace. SULAWESI SELATAN: Bua Kraeng, lectotype M (HNHM); Makassar, M, F, Rippon coll, NMWZ 1918.93. SULAWESI: (no data), M (HAMB).

Taxonomic note: I found 13 syntypes of *Sephena lurida* during my personal search for types in the Budapest Museum in 1988. Each was labeled: S. Celebes, Bua-Kraeng, 5000', H. Frustorfer, det. *rufomarginata* Melichar. A male selected from the series had the same genitalia as the Brussels specimen illustrated by Medler, 1987c, Fig. 5. This male is here designated as the lectotype because only the Budapest Museum was cited as depository in the original publication. The specimen with Melichar's determination found in the Brussels Museum was undoubtedly a part of the original Fruhstorfer collection examined by Melichar, but does not have syntype status, hence was designated lectotype in error. It should be mentioned that various specimens bearing the label "*rufomarginata* det. Melichar" are misidentifications of 3 species: *Sephena lurida* Melichar, *Poeciloflata uniformis* Melichar, and *Somisha retardata* Medler.

5. Genus *Somisha* Medler, gen. nov.

Type species: Poeciloptera calochroma Walker, here designated.

Diagnosis: Front margin of head obtusely conical, frons and vertex not separable, small flattened area on top of head delimited posteriorly by strong transverse carina between genal margins above eyes, small triangular areas adjacent to eyes. Frons with median longitudinal carina, lateral margins carinate, slightly elevated in median area above antennal insertions. Postocular eminence triangular, slightly separated from lateral carina of pronotum. Pro- and mesonotum not raised above level of head, median carina of pronotum weak, mesonotum tricarinate. Tegmen with 3 longitudinal veins (R,S,M) arising from basal stem, no closed discal cell, many terminal veins at apical margin, no submarginal line of crossveins, apical margin truncate, postclaval sutural margin straight, raised moderately, sutural angle nearly at right angle, costal angle rounded, overall angle nearly acute. Vein Cu not running adjacent to claval suture, extending beyond the claval apex to form inner margin of cell along the postclaval sutural margin, and giving rise to crossveins reaching margin.

Female segment X (wax plate) elongated, apical margin oval; valvulae I modified, non-sclerotized small median lobe; valvulae III without marginal spines or teeth. Hind leg spine formula 1:5:6, rarely 1:5:7, lateral spine relatively close to apex of tibia. Length: 8.5 - 14.0 mm.

Usually, but not always, specimens may be assigned to this genus by recognition of the distinctive pattern of white, yellow or orange spots in cells of the tegmina. When not faded, these spots give a strongly maculated appearance.

Distribution: Sulawesi, Philippines.

Taxonomic note: *P. calochroma* Walker was cataloged under *Neomelicharia* Kirkaldy by Metcalf, 1957: 393. My research shows that male and female genitalia of specimens determined by authors as *N. calochroma* represent a complex of taxa that differ considerably from all other species assigned to *Neomelicharia*. This finding leads to erection of the new genus *Somisha*. The new genus is related to *Sabaethis* Jacobi, but the head of *Somisha* is more elongate and its anterior margin more convex than seen in *Sabaethis*. Apical margin of tegmen nearly truncate and angles more or less acute in *Somisha*, whereas apical margin and both angles convex in *Sabaethis*. Species of *Somisha* distributed in Sulawesi have a strong superficial resemblance to members of new genus *Lecopia*, but invariably can be distinguished by presence of 1 metatibial lateral spine.

Key to species of *Somisha*

1. Distribution in Philippine Islands 2
 - Distribution in Sulawesi 5
2. Head produced, obtusely conical 3
 - Head not produced, truncate or nearly so 4
3. Tegmina heavily mottled with lengthwise alignments of yellow or orange cells
 - **S. calochroma** (Walker)

- Tegmina not mottled with yellow or orange, unicolorous or faintly mottled with white cells **imitacea** Medler, sp. nov.
4. Length usually less than 10 mm. Postclaval sutural and apical margins meeting at right angle; tegmina pale green **S. minica** Medler, sp. nov.
Size larger, length more than 10 mm. Postclaval sutural margin elevated, meeting apical margin at acute angle; tegmina pale green or white
. **S. electa** (Melichar)
5. Costal angles of tegmen widely convex to apical margin 6
Costal angle of tegmen not widely rounded, meeting apical margin at almost a right angle **S. conmela** Medler, sp. nov.
6. Tegmina concolorous, green or stramineous. **S. dilura** Medler, sp. nov.
Tegmina stramineous, the margins strongly red **S. retardata** Medler, sp. nov.

5.1. **Somisha dilura** Medler, sp. nov. (Figs. 9, 31)

Diagnosis: Morphological characters as given for the genus; postclaval sutural margin only slightly elevated, sutural and costal angles convex (Fig. 31). Color stramineous, veins of tegmen strongly orange, many cells hyaline white; apical margin, costal angle margin, and postclaval sutural margin thinly red; red color may be faded or lost. This species is best identified by the downturned apex of the ventral process of the aedeagus, as shown by the holotype (Fig. 9).

Measurements (holotype M, allotype F). Length: Overall 11.0, 12.0; v 0.29, 0.33; f 1.49, 1.49; p 0.58, 0.54; m 1.99, 2.16; t 9.30, 10.46; pcl 2.82, 3.15. Width: v 1.00, 1.04; f 1.33, 1.41; t 5.64, 5.64. Hind leg spine formula: each 1:5:6.

Holotype: Male, SULAWESI-UTARA: Dumoga-Bone National Park, II.1985, BM 1985-10. Allotype: female, same label as the holotype. Each in BMNH. *Paratypes:* SULAWESI UTARA: Dumoga-Bone National Park: M, 3 F, II.1985; M, IV-V.1985; M, VI.1985; Kotamobagu Lakes, on ? *Persea*, M, F, (Martin No. 4720); Edward's Camp, M, 29.IV.1985 (Martin), BMNH 1985-10; Clark's Camp, 1,140 m, at light, F, IV.1985 (Martin); 660-1,140 m, at light, M, IV-V.1985 (Martin) (LIPI); M, F, II.1985 (BPBM); light trap sample forest, 492 m, M, 5.IX.1985, (Kirk-Spriggs); Toraut, River Tumpah, on forest trail, 211 m, F, 31.VII.1985 (Kirk-Spriggs), NMWZ 1985-078; Hog's Back Subcamp, 660 m, Sta. 051, M, X.1985; Rentice II, 2,980 m, Sta. 073, M, XI.1985; Picnic Site, 250 m, Sta. 009, M, X.1985; River Tumpah, Sta. 052, M, X.1985; Danau Alta, 1,300 m, Sta. 069, F, 10.X.1985; Danau Mooat (The Lakes), Sta. 059, M, 28.X.1985, (Bosmans & Van Stalle); Danau Mooat, 1,000 m, Sta. 071, M, X.1985, (Bosmans & Van Stalle), IRSN 26.977; Danau Mooat, 1,000 m, Sta. 071, M, X.1985, (Bosmans & Van Stalle) (BPBM); Tangkoko National Park, Gunung Tangkoko, 50 m, Sta. 090, M, 10.XI.1985, (Bosmans & Van Stalle), IRSN 26.977. SULAWESI: Bohsoi [?, label partly illegible], F, 1896 (AM).

Taxonomic note: The genitalia illustrated by Medler, 1990a, Fig. 26, is the same as that illustrated for the holotype of *S. dilura*.

5.2. *Somisha conmela* Medler, sp. nov. (Fig. 10)

Diagnosis: Color green, except mesonotum, clypeus, and ventral aspect of body light ochraceous. Front and hind legs with green on each side of joints between femora and tibiae. Tegmen narrowly red on postclaval sutural margin, apical margin and short distance on costal angle, then narrowly ivory to near base of costal margin. Small white spots scattered in cells of tegmen, with alignment of spots in cells between veins S and M tinged with yellow. Sutural angle relatively sharp, slightly more than 90 degrees. Holotype genitalia are illustrated (Fig. 10).

Measurements (holotype M, allotype F). Length: Overall 11.5, 14.0; v 0.21, 0.29; f 1.33, 1.49; p 0.54, 0.66; m 1.99, 2.66; t 9.46; 11.62; pcl 3.49, 4.32. Width: v 1.08, 1.25; f 1.45, 1.62; t 5.64, 7.30. Hind leg spine formula: each 1:5:6.

Holotype: Male, S. Celebes [SULAWESI SELATAN], Patuhuang, I.1896, (H. Frustorfer) (with label "*Geisha distinctissima*, det. Melichar") (WIEN). Allotype: female, Celebes [SULAWESI], (with labels "ex Schulz coll., W. Wagner ded 1956" and "det. *Cryptoflata ferrugata*, F, W. Wagner 1956") (HAMB). Paratypes: Celebes [SULAWESI] (no data), M, ex Schulz coll., W. Wagner ded. 1956 (HAMB); Celebes [SULAWESI], Makassar, 2 F, (Muir) (BPBM); Celebes [SULAWESI], F, (Piepers) (AM). Not collected during Project Wallace.

5.3. *Somisha retardata* Medler, sp. nov. (Fig. 11)

Diagnosis: The external morphology is similar to congeners in the genus. Color uniformly stramineous, with strong red margin of tegmina extending from claval suture to beyond junction point of R+C veins. Characters of the male genitalia (Fig. 11) are similar to those of *S. imitacea* (Fig. 12), but differences in the paired inner and outer processes extending from apex of aedeagus are diagnostic.

Measurements (holotype M). Length: Overall 10.0; v 0.29; f 1.49; p 0.50; m 1.99; t 8.30; pcl 2.49. Width: v 0.95; f 1.16; t 4.07. Hind leg spine formula: 1:5:6.

Holotype: Male, Nord-Celebes [SULAWESI UTARA], Tolitoli, XI-XII.1895 (Fruhstorfer) (with label "*Sephena rufomarginata*, det. Melichar") (HNHM).

5.4. *Somisha calochroma* (Walker) (Fig. 8)

Poeciloptera calochroma Walker, 1858: 113 [sp. nov.]; Medler, 1990a: 10, Fig. 11 [male genitalia illustrated]. Neotype: male, PHILIPPINE ISL: Leyte: Babantagon (BPBM), here designated. Plesiotype: female, PHILIPPINE ISL: Leyte, Ticao (BPBM).

Neomelicharia calochroma: Distant, 1910: 331 [combined].

Diagnosis: Color variation ranges widely in this species, usually consisting of various shades of green or stramineous, presence or absence of yellow spots aligned lengthwise across disc of tegmen, and red color strong, weak, or absent at claval apex and along margins of tegmen. Red margins may be replaced by bluish green in strong contrast with background color of membrane. Also, veins may have deep green color in strong contrast with pale green color of membrane. Neotype genitalia are illustrated (Fig. 8). Apical configuration of aedeagus diagnostic, and visible without recourse to dissection in some specimens.

Measurements (neotype M, plesiotype F). Length: Overall 10.5, 12.0; v 0.33, 0.42; f 1.49, 1.49; p 0.54, 0.58; m 1.91, 2.32; t 8.96, 10.46; pcl 3.32, 3.49. Width: v 0.95, 1.00; f 1.20, 1.33; t 5.64, 6.14. Hind leg spine formula: each 1:5:6.

Specimens examined: PHILIPPINE ISLANDS: Leyte, Mindoro, Negros, and Samar; many specimens deposited in AM, BPBM, IRSN, HNHM, MNHN, NCSU, USNM, SCU and VSCA. Determinations were verified by examination of male genitalia.

Taxonomic note: The original description of *P. calochroma* was based on a male, Philippine Islands, Cummings collection (BMNH). My search in the British Museum disclosed only a single female without data labeled *Poeciloptera calochroma*. As this specimen cannot be verified as a valid syntype, I associated Walker's name with a common species in the central Philippine Islands, and earlier designated a plesiotype male to show characters of the male genitalia (Medler, 1990a: Fig. 11). Designation of the neotype at this time fixes Walker's name.

5.5. *Somisha imitacea* Medler, sp. nov. (Fig. 12)

Diagnosis: Color uniformly greenish stramineous or faded to varying extent. Margins of tegmen thinly red, or when faded, then margins light ivory. Red color especially present in males, and in such cases extended to legs. Median carina well developed on vertex and extended more than half length of frons. Head longer than congeners, vertex shallowly triangular, ratio of median length to half length of anterior margin 2:3. Costal and sutural angles of tegmen approximately 90 degrees, apical margin nearly truncate. Holotype genitalia are illustrated (Fig. 12).

Measurements (holotype M, allotype F). Length: Overall 10.0, 12.5; v 0.37, 0.50; f 1.49, 1.66; p 0.50, 0.66; m 1.70, 1.99; t 8.30, 10.62; pcl 2.99, 3.32. Width: v 0.91, 1.00; f 1.20, 1.33; t 4.98, 6.81. Hind leg spine formula: 1:5:6, 1:5:7.

Holotype: Male (BPBM No. 14,560), Mindanao, Agusan Prov., Esperanza, 4-11.XI.1958 (C.M. Yoshimoto). *Allotype*: female, Mindanao, Agusan Prov., Los Arcos, 19-23.XI.1959 (C.M. Yoshimoto). Both deposited BPBM. *Paratypes*: Mindanao: Zamboanga, 3 M, 7 F (AMNH); Mindanao, Camiguin, Kolambugan, Surigao, Zamboanga, 5 F (AM); Mindanao: Agusan Prov., Esperanza, 4 M, F, 4-11.XI.1959 (Yoshimoto); Los Arcos, 2 F, 19-23.XI.1959 (Yoshimoto); San Francisco, 10 km SE, 4 M, F, 12-18.XI.1959 (Quate & Yoshimoto); Misamis Or. Prov, Mt Balatukan, 15 km SW of Gingoog, 1,000-2,000 m, M, 1-5.V.1960 (Torrevillas); Mt Empagatao, 1,050-1,200 m, F, 19-30.IV.1961 (Torrevillas); Pigtibiran, M, 1-13.V.1961 (Torrevillas); Sulu Prov, Jolo, M, 2.IX.1958; M, F, 24.VIII.1958 (Milliron); Siasi, sea level, F, 24.VIII.1958 (Milliron); Zamboanga Del Norte Prov, Masawan, 1,250-1,400 m, F, 15.VII.1958 (Milliron); Masawan/Gundawan, 1,260-1,350 m, F, 3.VII.1958 (Milliron); Trail to Mt Malindang, 1,290 m, M, 2.VII.1958 (Milliron); Zamboanga Del Sur Prov, 32 km NM of Milbuk, 900 m, F, 6.VII.1958 (Milliron); Surigao Del Norte Prov, Surigao b. Mainit, F, 23.XI-1.XII.1959 (Yoshimoto); all above in BPBM. Basilan, F; Mindanao: Lanao Del Norte Prov, Kolambugan, M, 4 F; Philippine Isl, (no data), M (BMNH). Mindanao: Bukidnon Prov, Silipon, M, F (CAS). Basilan, F; Mindanao: Camiguin Isl, F; Lanao Del Sur, Momungan, F (NCSU). Basilan, 10 M, 5 F; Cebu: Cebu City, M; Mindanao: Cotabato Prov, Cotabato, M, F; Davao Prov, Davao, 5 M, F; Lanao Del Norte Prov, Ilagan, 2 M;

Surigao Del Norte Prov, Surigao, 2 M, 4 F; Zamboanga Del Norte Prov, Dapitan, M; Butuan, M (USNM). Mindanao: Zamboanga Del Norte Prov., Dapitan, 3 F (SCU). Philippine Isl (no data), M (Semper) (NRS).

Taxonomic note: This species was recorded only from the Philippine Islands, with most records from Mindanao. Color in many specimens is labile, and may be faded to whitish shades of original greenish colors.

5.6. *Somisha electa* (Melichar), comb. nov. (Figs 13, 32-34)

Colgar calochroma electa Melichar 1902: 109 [var. nov.]; Medler, 1986c: 48, Fig. 9 [lectotype male genitalia illustrated]. Lectotype: male, PHILIPPINE ISL: Luzon, Tagor (MNHU). *Neomelicharia calochroma* var. *electa*: Metcalf, 1957: 395 [catalog].

Diagnosis: Color pale greenish, often faded to translucent white, margins of tegmina rarely red. Sutural angle of tegmen acute, postclaval sutural margin elevated above line of claval suture (Fig. 32). Head moderately produced, vertex shallowly triangular, slightly more acute in males than in females (Fig. 33). Frons merging with dorsum of head without carinal margin, only slight indication of horseshoe-shaped carina, median longitudinal carina extending about half length of frons (Fig. 34). Overall length of smaller specimens may be within range of *S. minica*, and examination of male genitalia is then needed for positive determination. The original figure of lectotype genitalia given by Medler, 1986e, is reproduced here (Fig. 13) to facilitate identification of the species.

Specimens examined: PHILIPPINE ISLANDS: numerous localities. Determinations were verified by examination of male genitalia of specimens from Basilan, Bohol, Cebu, Leyte, Luzon, Mindanao, Mindoro, Negros, Panay, and Polilo. Determined specimens deposited in AM, BPBM, BMNH, CAS, HAMB, NCSU, USNM, SCU, VSCA.

5.7. *Somisha minica* Medler, sp. nov. (Fig. 14)

Diagnosis: Color light green, margin of tegmen thinly red, especially in males. Genitalia distinctive, as shown by illustration of the holotype (Fig. 14). Normally recognized as the smallest species in the genus. If specimens are 10 mm or less, vertex not angularly produced, and sutural angle slightly obtuse, then probably *S. minica*. If size is about 10.5 mm, vertex angularly produced, and sutural angle acute, then probably *S. electa*.

Measurements (holotype M, allotype F). Length: Overall 8.5, 10.5; v 0.25, 0.25; f 1.16, 1.25; p 0.46, 0.50; m 1.41, 1.83; t 6.81, 8.80; pcl 2.32, 2.99. Width: v 0.79, 0.91; f 1.00, 1.16; t 3.82, 4.98. Hind leg spine formula: each 1:5:6.

Holotype: Male (BPBM No. 14,559), Luzon, College Laguna, 4.III.1981, (L. de Jesus). Allotype: female, Luzon, College Laguna, 5.I.1981, (R. Eborá). Both in BPBM. Paratypes: Luzon, College Laguna, M, 24.II.1981; F, 4.III.1981 (S.S. Ng) (VSCA). Luzon, Camarines Sur, Mt Isarog, 800 m, M, 29.IV.1965 (Torrevillas) (BPBM).

5.8. *Somisha spumans* (Breddin), comb. nov.

Nephesa spumans Breddin, 1900:199 [sp. nov.]. Syntype(s): SULAWESI: Dongola [sic], 282.

Depository and sex unknown.

Geisha spumans: Melichar, 1902: 27 [combined].

Neomelicharia spumans: Melichar, 1923:81 [combined]; Metcalf, 1957:392 [catalog].

Specimen examined: SULAWESI UTARA: Gorontalo, female, No. 5113, *Colobesthes* n. sp., *Geisha spumans* Breddin ?? Melichar det. (MNHU). Not collected during Project Wallace.

Diagnosis: Background color of body greenish orange, pair of orange stripes extending lengthwise from base of head to apex of mesothorax, separated by shallow median carina on prothorax and anterior margin of mesothorax. Tegmina yellowish orange, precostal margin tinged with green basally, discal part of tegmina with scattering of cells containing clear white clear centers, margins narrowly red in apical half of tegmen from apex of clavus. Segment X circular, length 1.66 mm, width 1.66 mm.

Measurements (F, Gorontalo). Length: Overall 10.0 mm; v 0.29; f 1.33; p 0.50; m 1.49; t 9.00; pcl 3.90. Width: v 0.83; f 1.16; t 4.50. Hind leg spine formula: 1:5:6.

Taxonomic note: All previously published generic combinations were undoubtedly erroneous. If the above female specimen from Gorontalo actually represents *Nephesa spumans* sensu Breddin, then this species unquestionably belongs in *Somisha*. Breddin (1900) recorded 1 posttibial lateral spine, and associated the holotype with *Poeciloptera calochroma* Walker in his original description. Positive recognition of this species requires examination of type material along with study of male genitalia. If types cannot be found, then specimens collected from the type locality (Dongola [sic] = Donggala, 0°40'S 119°44'E) may help in disposition of the species.

6. Genus *Acutisha* Medler, new genus

Type species: *Acutisha sulawesiensis* Medler, here designated.

Diagnosis: Head elongate conical, frons with median longitudinal carina, dorsal surface of head with carina which continues on pro- and mesonotum. Ocelli small and weak. Postocular eminence of pronotum triangular, without connection to lateral carina. Apical margin of tegmen truncate, postclaval sutural angle acute, clavus strongly pustulate basally. The genus resembles *Somisha*, but head much more acutely pointed, and sutural angles of tegmina more acute and elevated. Female segment X (wax plate) elongate-oval; valvulae I small non-sclerotized median lobe; valvulae III margins without spines or teeth. Metatibial preapical lateral spine: 1.

Distribution: Sulawesi, Java.

6.1. *Acutisha sulawesiensis* Medler, sp. nov. (Fig. 18)

Diagnosis: Morphological characters same as given for genus. Color uniformly stramineous, except margins of tegmina which are thinly red. The red coloration may be lost in bleached specimens. Holotype genitalia are illustrated (Fig. 18).

Measurements (holotype M, allotype F). Length: Overall 14.0, 18.0; v 1.00, 1.08; f 1.99, 2.16; p 0.66, 0.83; m 2.16, 1.66; t 9.96, 12.62; pcl 3.65, 4.65. Width: v 0.91, 1.00; f 1.29, 1.49; t 6.14, 7.64. Hind leg spine formula: each 1:5:6.

Holotype: Male, Celebes [SULAWESI], Minahasa, Distant, BMNH 1911-383. *Allotype*: female, same labels as holotype. Both in BMNH. (Specimens were labeled "*Colgar celebensis* Distant", an unpublished name). *Paratypes*: SULAWESI UTARA: Dumoga-Bone National Park: Toraut, nr Base Camp, ca 200 m, M, 10.III.1985, *Eugenia* sp, overhanging Tumpah R, pale green in life (Martin); at light, 660-1,140 m, M, IV-V.1985 (Martin No. 4632); Clark's Camp, 1,140 m, at light, M, V-1985 (Martin); F, II.1985 (no data), BMNH 1985-10; 660-1,140 m, at light, M, IV-V.1985, (Martin No. 4632); F, II.1985 (BPBM); River Tumpah, 200 m, Sta. 041, F, X.1985 (Bosmans & Van Stalle), IRSN 26.977; Celebes, Minahasa, M, (Haglund), "*farinosa* det Melichar" (NRS).

6.2. *Acutisha* sp.

A female specimen, Java, Rippon coll, NMWZ 1918.93, is here recorded, but not named. The specimen is indistinguishable from *A. sulawesiensis*, but precise determination of the Java population will require knowledge of the male. Length: 16 mm, spine formula 1:5:6.

7. Genus *Sabaethis* Jacobi

Semidalis Jacobi, 1915: 170 [gen. nov.]. Preoccupied by *Semidalis* Enderlein, 1905.

Sabaethis Jacobi, 1916: 314 [nom. nov.]; Metcalf, 1957: 362 [catalog].

Type species: *Semidalis micholitzii* Jacobi, original designation.

Diagnosis: In lateral view, mesothorax convexly elevated above plane of head and prothorax. Frons slightly longer than wide, 1.66 x 1.25 mm, strong median longitudinal carina, lateral carinae sharp, raised; frons convex dorsally, postero-dorsal margin delimited by interocular transverse carina arising from genal margins, vertex not recognizable. Apical margin of tegmen strongly oblique, costal and sutural angles convex, dissimilar, 3 longitudinal veins (R,S,M) arising from basal stem, S vein forked, veins M1 and M2 extending beyond S fork before second forking. No submarginal line of crossveins, Cu cell present, vein Cu not closely alongside claval suture, extending past claval apex, forming interior margin of cell along postclaval sutural margin. Female segment X (wax plate) elongate oval, valvulae I small non-sclerotized median lobe; valvulae III margins without spines or teeth. Length 12-13 mm. Metatibial preapical lateral spine: 1.

Distribution: Philippines, Flores.

7.1. *Sabaethis micholitzii* Jacobi

Semidalis micholitzii Jacobi, 1915: 170 [sp. nov.]; Medler, 1986a: 110 [holotype female];

Sabaethis micholitzii, Metcalf, 1957: 363 [catalog]. Holotype: female, PHILIPPINE ISL: Mindanao: Davao (DSMT).

Specimens examined: PHILIPPINE ISL: Misamis Or: Hindangon, 20 km S of Gingoog, 600-700 m, at light, F, 20-24.IV.1960 (Torrevillas) (BPBM); Mindanao: Davao, holotype F (DSMT).

7.2. *Sabaethis subflava* (Melichar)

Paratella subflava Melichar, 1902: 119, pl. 3, Fig. 8 [sp. nov., illustrated]; Medler, 1987c: 39 [lectotype designated]. Lectotype female, FLORES: Iles de la Sonde (IRSN).
Sabaethis subflava: Medler, 1987c:39 [combined].

Diagnosis: Morphology of tegmina and female genitalia as described for genus. Color greenish orange, spots of whitish waxy powder giving maculated pattern of tegmina shown in Melichar's illustration (1902, Fig. 8). In lectotype, hind legs lost and female segment X damaged; in paralectotype, metatibial spines 1:5 and anal segment X intact, length 3.5 mm, width 1.99 mm.

Specimens examined: FLORES: lectotype F (IRSN); FLORES: paralectotype F (HAMB); FLORES: F, Fruhstorfer, det Melichar (HNHM), undoubtedly part of the same series as syntypes, but depository not cited in original description.

Taxonomic note: It has not been possible to give better disposition of species in *Sabaethis* or solve the problem of their disjunct distribution, as all known specimens are female and characters of the male genitalia are required for understanding this taxon.

8. Genus *Nullina* Medler, gen. nov.

Type species: *Nullina nigritans* Medler, here designated.

Diagnosis: Frons convex at clypeus, flat in discal area, abruptly angulate at margin with vertex, median longitudinal carina about 0.5 length of frons; margin between frons and vertex with faint trace of carina, disc of vertex flattened; pronotum shallowly depressed, postocular eminence and lateral carina absent; mesonotum with median longitudinal carina. Tegmen with two longitudinal veins (R+S,M) arising from basal stem, R+S stem short, M fork basal of S fork, M1 and M2 forks apical of S fork, distinct space between vein Cu and claval suture, Cu continuing apicad of claval apex as margin of postclaval sutural cell with 4-6 crossveins to sutural margin. Y-stem short, postclaval sutural margin raised convexly, apical margin oblique with irregular pattern of single or forked terminal veins, lengths of pre-terminal branches variable; veins R and C united apically, R+C extended as irregular line of crossveins for short distance in costal margin area. Female anal segment X (wax plate) elongate oval, valvulae I modified as small non-sclerotized lobe, valvulae III margin without spines or teeth. Metatibial preapical lateral spine absent.

Distribution: Sulawesi.

8.1. *Nullina nigritans* Medler, sp. nov.

Diagnosis: Prothorax and tegmina dark fuscous to black, head and venter light brown, legs light brown except femora are darker brown. Vertex anteriorly with pair of ivory maculae on each side of median carina; frons with median and lateral carinae ivory brown, ocelli and base of antennae ivory. Tegulae and costal margins of tegmina narrowly brownish-ivory as far as R+C terminals, ivory spot at apex of clavus between claval suture and vein Cu. Overall dark fuscous color faded to uniform light brown in one paratype.

Measurements (holotype F). Length: Overall 7.75; v 0.17; f 0.79; p 0.33; m 1.16; t 6.47; pcl 2.16. Width: v 0.50; f 0.66; t 3.32. Hind leg spine formula 0:5:5.

Holotype: Female, SULUWESI UTARA: Dumoga-Bone National Park: Clarks Camp, 1140 m, V.1985 (Martin), BM1985-10. Deposited in BMNH. Paratypes: 2 females, same label as holotype. One each in BMNH and BPBM.

Taxonomic note: Lack of any indication of a preapical metatibial lateral spine is a character state found also in *Adelidoria glauca* (Kirby) from Ceylon.

Tribe SISCIINI Melichar

9. Genus *Miniscia* Medler, gen. nov.

Type species: *Phleboterum maculatum* Melichar, here designated.

Diagnosis: Frons slightly concave, without median carina on disc, dorsal margin convex, sharply delimiting anterior margin of vertex; posterior margin of vertex delimited by indistinct transverse carina extending between genal margins above eyes, median longitudinal carina weak, lost on pronotum, outlined by white line on mesonotum. Postocular eminence triangular, elevated, no connection between eminence and lateral carina of pronotum. Tegmen with 3 longitudinal veins (R,S,M), crossveins strong, forming rather large cells, vein S forked once, M1 and M2 elongated, without branching until almost in line with claval apex. Vein Cu extending to relatively wide distance from claval suture, postclaval sutural margin elevated, nearly right angled with truncate apical margin, costal angle broadly convex, apical crossveins forming submarginal line. Vein Cu extended beyond claval apex, parallel to sutural margin, forming cell with about 6 cross veins. Clavus with numerous pustules basally and along sutural margin. Female segment X (wax plate) elongate oval; valvulae I very small non-sclerotized median lobe, valvulae III margins without spines or teeth. Metatibial preapical lateral spine: 2.

Distribution: Sulawesi, Philippines.

Key to species of *Miniscia*

1. Frons circular (Fig. 24); vertex shorter than wide, anterior margin nearly truncate 2
- Frons oval (Fig. 25); vertex as long as wide, anterior margin convex *M. fortunata* Medler, sp. nov.

2. Base color of tegmina light green, spots in cells relatively large, polygonal (Philippines) **M. decapita** Medler, sp. nov.
Base color of tegmina white or yellow, spots in cells small, round (Sulawesi) . . . 3
3. Male, distinguished by genitalia characters 4
Female **M. adera** Medler; **M. maculata** (Melichar)
4. Aedeagus as shown in Fig. 15 **M. adera** Medler, sp. nov.
Aedeagus as shown in Fig. 16 **M. maculata** (Melichar)

9.1. **Miniscia maculata** (Melichar), comb. nov. (Figs 16, 24)

Phleboterum maculatum Melichar, 1902: 2, pl. 4, Fig. 4 (sp. nov.; illustrated); Medler, 1986b: 114 (holotype female). *Holotype*: Female, N. Celebes [SULAWESI], Tolitoli (HNHM). *Plesiotype*: Male, SULAWESI UTARA: Dumoga-Bone National Park, February (BPBM), here designated.

Sephenia maculata: Melichar 1902: 231 (combined).

Diagnosis: Overall color of body and tegmina stramineous, ventral lobe of pronotum red, 4 longitudinal wide stripes on dorsum of pro- and mesonotum bright red or red orange; margins of tegmina red interspersed with white pustules, whitish clear spots in cells giving distinctive maculated appearance. Red stripes along lateral margins of pronotum narrow, not extended on vertex; median stripes extended short distance on vertex, then terminated. Stripes variable, may be reduced or lost, red on vertex and genae variable, may be faded or lost. Red margins of tegmen suffused with black, spot at apex of clavus black, vein A2 thinly carinate, black, bordered with orange along suture, red along interior side. Frons circular (Fig. 24). Genitalia of the plesiotype are illustrated (Fig. 16).

Measurements (plesiotype M, holotype F). Length: Overall 8.5, 9.5; v 0.50, 0.37; f 1.16, 1.08; p 0.62, 0.54; m 1.49, 1.91; t 7.14, 7.47; pcl 2.32, 2.32. Width: v 0.83, 0.83; f 1.08, 1.16; t 3.98, 4.48. Hind leg spine formula: 2:5:5, 2:5:5.

Specimens examined: SULAWESI UTARA: Dumoga-Bone National Park: M, 6 F, II.1985; 660-1,140 m, at light, M, IV/V.1985 (Martin), BMNH 1985-10; plesiotype M, F, II.1985 (BPBM); Tolitoli, holotype F (HNHM).

9.2. **Miniscia adera** Medler, sp. nov. (Fig. 15)

Diagnosis: Distinguished from *M. maculata* by different configuration of processes at apex of aedeagus (Fig. 15).

Measurements (holotype M). Length: Overall 9.05; v 0.33; f 1.16; p 0.58; m 1.49; t 6.97; pcl 2.16. Width: v 0.75; f 1.00; t 3.49. Hind leg spine formula: 2:5:5.

Holotype: Male, SULAWESI UTARA: Dumoga-Bone National Park: February, BMNH 1985-10. *Paratype*: Male, same labels as holotype (BPBM).

9.3. **Miniscia decapita** Medler, sp. nov. (Fig. 20)

Diagnosis: Characters of thorax and tegmina congeneric with those of *M. maculata*; longitudinal bands on pronotum very faint orange, probably faded from red, pronotum unmarked; tegmina with numerous small round white spots in most

cells; costal, apical and sutural margins red as described for genus. Male genitalia similar to that of *M. maculata*, except paired apical processes of aedeagus shaped differently as illustrated (Fig. 20).

Measurements (headless holotype M). Length: m 1.41; t 6.31; pcl 1.83. Width: t 3.57. Hind leg spine formula: 2:5:5.

Holotype: Headless male, PHILIPPINES: Mindanao, Agusan Prov, Los Arcos, 19-23.IX.1959 (L.W. Quate) (BPBM).

9.4. *Miniscia fortunata* Medler, sp. nov. (Figs 19, 25)

Diagnosis: Color of tegmina and red markings similar to *M. maculata*, but black in clavus reduced and less intense. Female head, pro- and mesonotum without any indication of red or orange, tegmina slightly more pointed, apical margin slightly concave next to sutural angle. Male similar to female, but markings reduced, red margins of tegmina not as wide, and vein A2 thinly black. The elongate shape of frons (Fig. 25) and narrowly oval anterior margin of vertex give easy recognition of this species. The holotype genitalia are illustrated (Fig. 19).

Measurements (holotype M, allotype F). Length: Overall 9.25, 11.0; v 0.83, 0.87; f 1.58, 1.83; p 0.62, 0.66; m 1.49, 1.66; t 6.97, 8.47; pcl 2.03, 2.49. Width: v 0.75, 0.87; f 1.00, 0.83; t 3.49, 4.15. Hind leg spine formula: both 2:5:5.

Holotype: Male, Acc. No. 2513. Govt. Lab. Coll., Distant coll, BMNH 1911-383 (with label "*Salurnis granulosa* Stål, det Distant,"). *Allotype*: Female, PHILIPPINES, 1908-228 (C. S. Banks), Acc. No. 2513, Govt. Lab. Coll. Both types in BMNH.

Taxonomic note: The types are specimens of the second species from Manila reported by Banks, 1910:45. Banks correctly stated that "this second species was identified by Distant as *S. granulosa*, but certainly does not conform with Stål's description, either generically or specifically."

Tribe FLATOIDINI Melichar

10. Genus *Atracis* Stål

Atracis Stål, 1866a: 250 [gen. nov.]; Metcalf, 1957:466 [catalog, as *Uxantis*]; Medler, 1988a: 17 [restricted].

Type species: *Flata pyralis* Guérin-Méneville, subsequent designation by Distant, 1906:450.

Diagnosis: Dorsum of head not longer than pronotum along median line, frons about twice longer than wide; in side view, dorsum of head and thorax extended in horizontal plane; lateral margins of frons strongly convex, clypeus nearly horizontal, proboscis extended apicad of hind coxae. Postocular eminence of pronotum variable, either shallow non-carinate ridge, or slightly raised triangular cone. Tegmen with two longitudinal veins, M and long stemmed R+S; cell C closed apically by strongly curved vein R, veins in apex of tegmen bifurcated before terminating at corrugated apical margin; no submarginal line of crossveins. Clavus apex blunt, thickened, with

elongate Y-stem terminating medially at truncate margin. Female segment X (wax plate) enlarged, about twice wider than long; valvulae I reduced, lobelike, non-sclerotized; valvulae III without marginal teeth or spines.

Distribution: New Guinea, Philippines, Indomalayan Region.

Key to species of *Atracis* in Sulawesi

1. Dorsal surface of vertex divided longitudinally by a deep notch; postocular eminence no more than a flattened ridge 2
Dorsal surface of vertex without a median longitudinal notch; postocular eminence nipplelike 3
2. Frons with 3 longitudinal carinae, outer carinae V-shaped (Sulawesi) (Fig. 27)
. ***A. crenata*** Medler, sp. nov.
Frons with median longitudinal carina only (New Guinea) (Fig. 26)
. ***A. pyralis*** (Guérin-Ménéville)
3. Precostal marginal cell with strong median line of zigzag crossveins
. ***A. consputa*** Stål
Precostal marginal cell without zigzag line of crossveins . ***A. solennis*** (Melichar)

10.1. *Atracis solennis* (Melichar)

Uxantis solennis Melichar, 1902: 164 [sp. nov.]; Metcalf, 1957: 469 [catalog]; Medler, 1986b: 115, Fig. 13 [holotype male genitalia illustrated]. Holotype: Male, S. Celebes [SULAWESI SELATAN]: Bua-Kraeng (HNHM)

Atracis solennis, Medler, 1988a: 18 [combined].

Diagnosis: Anterior margin of vertex truncate, length medially not longer than pronotum. Strong brownish black dash on gena extending between anterior margin and eye. Viewed from above, overall color brownish; from below, sides of head, thorax and most of legs with much lighter coloration; frons ivory except light brown along dorsal margin.

Measurements (holotype M). Length: Overall 11.5; v 0.33; f 1.25; p 0.58; m 1.83; t 9.30; pcl 3.32. Width: v 0.83; f 1.16; t 3.32. Hind leg spine formula 1:5:6.

Specimens examined: SULAWESI UTARA: Dumoga-Bone National Park: taken on newly felled *Gnetum gnemon* tree, F, 12.III.1985 (Martin), BMNH 1985-10. SULAWESI SELATAN: Bua-Kraeng, holotype M (HNHM).

10.2. *Atracis crenata* Medler, sp. nov. (Fig. 27)

Diagnosis: Frons tricarinate (Fig. 27); postocular eminence absent; Y-stem elongate, about half length of claval suture from claval apex to tip of scutellum; other morphological characters as given for the genus. Dorsal appearance of thorax dark brown, tegmen lighter shade of brown, color of veins and membrane uniform, 12-18 pustules in base of clavus lighter color than membrane; ventral aspect of body light ochraceous.

Measurements (holotype F). Length: Overall 11.0; v 0.50; f 1.74; p 0.83; m 1.87; t 9.13; pcl 2.99. Width: v 1.00; f 1.49; t 2.99. Hind leg spine formula: 1:5:5.

Holotype: Female, SULAWESI UTARA: Dumoga-Bone National Park: Edward's Camp, 664 m, at light, V.1985 (Martin), BMHN 1985-10. Paratypes: 2 females, same labels as holotype. One each in BMNH and BPBM.

Taxonomic note: One paratype had metatibial spine formula of 2:5:5. This bispinose condition was aberrant, otherwise the 3 specimens were the same. A tricarinate frons is normally not found in the genus *Atracis*.

10.3. *Atracis consputa* Stål

Atracis (Uxantis) consputa Stål, 1870: 776 [sp. nov.]; Medler, 1986d: 326 [lectotype male designated]. Lectotype: male, PHILIPPINE ISL (NRS).

Atracis consputa: Medler, 1988a: 18 [combined].

Uxantis consputa: Melichar, 1902: 163, pl. 9, Fig. 8 [illustrated]; Metcalf, 1957:467 [catalog];

Diagnosis: Tegminal membrane light ochraceous in strong contrast with network of dark brown markings concentrated along veins and crossveins. Precostal cell with strongly zig-zag median line of crossveins; apex of clavus conspicuously dark brown. Mesothorax uniformly brown, lateral carinae weak, median carina absent.

Specimens examined: SULAWESI UTARA: Tondano, headless F, V.25.1939 (R.G. Wind) (NCSU). Known from lectotype M and also many specimens, Philippine Isl: Luzon (USNM).

10.4. *Atracis pyralis* (Guérin-Méneville) (Fig. 26)

Flata pyralis Guérin-Méneville, 1831: pl. 10, Fig. 11 [illustrated]; 1838: 192 [described]; Medler, 1988: 17 [holotype, plesiotype male genitalia illustrated]

Uxantis pyralis: Melichar, 1902: 166 [combined].

Atracis pyralis: Metcalf, 1957: 493 [catalog].

Diagnosis: Morphology as given above for genus. Vertex with longitudinal median suture, anterior margin strongly notched. Pronotal median carina shallow, disc of mesonotum flat, scutellum elevated, flanked by raised margin of clavus. Overall appearance light brown; tegmina covered by fine network of brown lines associated with veins and crossveins; apex of clavus strongly brown.

Distribution: The type species of *Atracis* is known only from New Guinea and its outlying islands. An illustration of the frons (Fig. 26) is presented to show the median carina character state normally found in the genus, with exception of the tricarinate frons present in *A. crenata*.

11. Genus *Cerfennia* Stål

Flatoides (Cerfennia) Stål, 1870: 774 [gen. nov.]. Type species: *Flatoides (Cerfennia) philippinus* Stål, monotypic.

Cerfennia, Metcalf, 1957: 473 [catalog].

Rabocha Melichar, 1923: 109 [gen. nov.]; Metcalf, 1957: 473 [synonymized].

Type species: *Rabocha philippina* Stål, original designation.

Diagnosis: Vertex longer than pronotum. In lateral view, head in much lower plane than thorax, posterior half of pronotum and anterior margin of mesonotum convexly elevated, humplike. Postocular eminence of pronotum absent, antero-ventral

margin of pronotal lobe extended as thin layer, often rolled inward. Veins R+S and M arising from basal stem, vein R crossing elevated pustulate bulla, continuing strongly ridgelike to R+C junction. Vein C clearly giving rise to somewhat irregular apical submarginal line consisting of numerous short crossveins, and terminating at claval apex; apical submarginal area approximately same width as apical one third of precostal margin. Clavus elevated basally, with numerous large pustules. Female anal segment X oval, not enlarged; ovipositor adapted for piercing; valvulae I elongate, strongly sclerotized, apically serrate; valvulae III elongated horizontally, clasping valvulae I distally, distal margin narrow with 3-4 very strong teeth. Metatibial preapical lateral spine: 1.

Distribution: Philippines, Indomalayan Region.

11.1. *Cerfennia celebensis* (Melichar)

Atracis celebensis Melichar, 1902: 183 [sp. nov.]. Holotype: female, Celebes [SULAWESI], Minahassa, Brno Museum.

Cerfennia celebensis: Metcalf, 1957: 474 [catalog].

Specimens examined: The holotype female, length 18-20 mm [sic], supposedly in Melichar's collection, Brno, was not available for study. This species has not been recorded subsequent to original description. Melichar's description of valvulae III applies equally well to *Cerfennia philippina* Stål, and *C. celebensis*, possibly is a junior synonym.

Tribe PHYLLYPHANTINI Melichar

12. Genus *Salurnis* Stål

Salurnis Stål, 1870: 773 [gen. nov.]; Metcalf, 1957: 193 [catalog].

Type species: *Salurnis granulosa* Stål, monotypic.

Diagnosis: Head sharply conical, vertex overlapped by anterior margin of pronotum, transverse dorsal carina connecting margins of genae above eyes obscured medially. No median longitudinal carina on frons or dorsum of head; frons slightly concave medially; convexly widened above antennal insertions, lateral carinae sharp. Postocular eminence well developed, broadly triangular, anterior margin extended as strong ridge to antero-ventral apex of paranotal lobe, dorsal margin nearly joined to lateral carina of pronotum; mesonotal carinae well defined. Tegmen with 2 main longitudinal veins (R+S, M), strongly developed crossveins that enclose large cells on membrane, including discal cell, Cu cell relatively wide between vein Cu and claval suture, clavus with numerous large pustules between veins A1 and A2, postclaval sutural angle elevated, acutely pointed, interveinal cells brown or black at margins; costal cell with strong network of crossveins; dark margins of tegmina contrasting strongly with green or yellow green membrane. Female segment X not elongated, distal margin incurved ventrally to fit contour of valvulae III; valvulae I heavily sclerotized, adapted for piercing, valvulae III not clasping valvulae I basally, apico-ventral inner surfaces with dense pad of rasplike teeth. Metatibial preapical lateral spine 1.

Distribution: Indomalayan Region, Philippine Islands, Southern China.

12.1. *Salurnis granulosa* Stål

Salurnis granulosa Stål, 1870: 774 [sp. nov.]; Breddin, 1901: 34 [Celebes: Tolitoli]; Melichar, 1902: 41, pl. 3, Fig. 20 [illustrated]; Medler, 1986d: 328, Fig. 9 [holotype male genitalia illustrated]. Holotype: male, PHILIPPINE ISL (NRS).

Diagnosis: The venation and shape of tegmina, head morphology, and color pattern as given for the genus enable generic assignment, but study of male genitalia is needed to precisely determine taxa in several closely related species complexes. *S. granulosa* belongs to the complex having 3 longitudinal carinae on the mesonotum, and apex of clavus with large black spot. Length: M, 11.0-11.5 mm; F, 12.0-13.0 mm.

Specimens examined: SULAWESI UTARA: Dumoga-Bone National Park: Toraut, 211 m, on forest trail, river Tumpah, F, 31.VII.1985 (Kirk-Spriggs), NMWZ 1985-078. Tolitoli, N. Celebes, F, det. Melichar (WIEN). Probably this is the specimen recorded by Breddin, 1901: 34.

13. Genus *Phyllyphanta* Amyot & Serville

Phyllyphanta Amyot & Serville, 1843: 523 [gen. nov.]; Metcalf, 1957: 180 [catalog].
Type species: *Poeciloptera producta* Spinola, monotypic.

Diagnosis: Head conical; frons without median longitudinal carina, lateral margins outwardly flared; dorsum of head with strong longitudinal carina, which extends across pro- and mesonotum; postocular eminence of pronotum truncated cone, margin strongly ridged and reaching ventral margin of paranotal lobe; tegmina with 2 longitudinal veins (R+S, M) arising from basal stem, costal cell twice as wide as precostal margin, filled with network of crossveins, sutural angle acutely pointed, raised, clavus heavily pustulated between veins A1 and A2, without Y-stem; female segment X apically triangular, bluntly pointed; valvulae I heavily sclerotized, adapted for piercing; valvulae III apical margin wide, clasping valvulae I basally, inner surface lined with elongate pad of dense rasplike teeth, margin lined with fine hairs. Length: M, 12.5 mm; F, 13.5 mm. Metatibial preapical lateral spine 1.

Distribution: Indomalayan Region.

13.1. *Phyllyphanta producta* (Spinola) (Fig. 17)

Poeciloptera producta Spinola, 1839: 432 [sp. nov.]. Type: Not in Spinola Collection and presumed lost. Neotype: male, JAVA: Batavia, XII.1818, Westermann Mus; here designated. Deposited in Copenhagen Museum.

Phyllyphanta producta: Melichar, 1902: 55, pl. 4, Fig. 3 [illustrated]; Metcalf, 1957: 184 [catalog].

Diagnosis: Morphological characters as given for genus were correctly interpreted by Melichar's illustration (pl. 4, Fig. 3). Color variable, light to dark green, stramineous when green replaced; bulla shiny black or not marked; black spot at claval apex and interveinal black along postclaval margin. Neotype male genitalia as illustrated (Fig. 17).

Specimens examined: Not collected during Project Wallace. SULAWESI UTARA: Tolitoli, M, det Melichar (WIEN); Tolitoli, F, det. Melichar (HNHM).

Taxonomic note: This species was described by Spinola based on specimens from Java. A specimen in the Spinola collection, Museo Regionale di Scienze Naturali, Torino, listed as type by Casale (1981) and O'Brien (1988) was examined, but proved to be a mislabeled acanaloniid. An anomalous feature of the associated label "Bresil, Thorey, 18.IX.80" was the date 23 years after Spinola's death. Signoret's type in Vienna that was cited by Melichar, and presumed to be derived from Audinet-Serville's collection, was not found when I searched the collection in 1988. I conclude that the syntypes of *P. producta* are lost, and therefore here designate the neotype.

Tribe LAWANINI Melichar

14. Genus *Cromna* Walker

Cromna Walker, 1857: 85 [gen. nov.]

Type species: *Cromna acutipennis* Walker, monotypic.

Diagnosis: Character states used to distinguish this genus include conical head, poorly developed longitudinal median dorsal carina, acutely pointed sutural angle of tegmen, 3 longitudinal veins (R,S,M), green or faded green color, 2 metatibial spines and moderate sizes (lengths 10-15 mm). Female segment X quadrate, slightly concave apically; valvulae I heavily sclerotized and adapted for piercing; valvulae III apical margin wide, clasping valvulae I basally; apico-ventral inner surface with circular pad of dense rasplike teeth.

Distribution: Indomalayan Region.

14.1 *Cromna sinensis* (Walker)

Poeciloptera sinensis Walker, 1851: 451 [sp. nov.]. Lectotype: male, HONG KONG (BMNH).

Phyllyphanta sinensis: Distant, 1906: 415, Fig. 216 [illustrated, Celebes]; Metcalf, 1957: 185 [catalog].

Cromna sinensis: Medler, 1990a: 34, Fig. 31 [combined; male genitalia illustrated].

Diagnosis: The uniformly green color may be bleached to stramineous shades. Lectotype male measurements and illustration of the genitalia given by Medler, 1990a: 34, Fig. 31. Length: 12.5 mm. Hind leg spine formula: 2:7:8.

Specimens examined: Not collected during Project Wallace. SULAWESI UTARA: locality unknown. This Celebes record was based on Distant's determination of *Phyllyphanta sinensis*. The record has not been confirmed since original publication. The specimen cited by Distant was not found in the British Museum. My research shows wide distribution of this species in the Indomalayan Region. As there is probability that a valid record of *Cromna sinensis* exists in Sulawesi, the species is included here.

Taxonomic note: Misunderstood by Distant and other authors for many years, this species clearly has characters that preclude placement in the *Phyllyphanta* complex of genera. It properly belongs in the *Lawana* complex of genera, and can be easily recognized by close attention to characters of the head, venation, and metatibial spines given above.

Tribe CERYNIINI Distant

15. Genus *Cerynia* Stål

Cerynia Stål, 1862c: 68 [gen. nov.]; Metcalf, 1957: 94 [catalog].
Type species: *Flata albata* Stål, original designation.

Diagnosis: Antennal segments I and II about equal in length, segment II flattened, excavated on outside face for about 3/4 length of segment. Apex of tegmen broadly convex, submarginal vein present. Three longitudinal veins (R,S,M) arising from node of basal stem, bulla elevated, often colored red, crossed by vein R. Female genitalia not modified; valvulae I heavily sclerotized, adapted for piercing; valvulae III apical margin lined with row of small teeth. Metatibial preapical lateral spines 2.

Distribution: Southeast Asia, Indomalayan Region.

15.1. *Cerynia fulgida* Melichar (Fig. 23)

Cerynia fulgida Melichar, 1901: 221 [sp. nov.]; Metcalf, 1957: 97 [catalog]. Lectotype: male, S. Celebes [SULAWESI SELATAN], Samanga, Nov. 1895 (H. Fruhstorfer) (labeled "*fulgida* det. Melichar") (WIEN), here designated. Paralectotypes: S. Celebes [SULAWESI SELATAN], Patuhuang, M, Jan.1896 (H. Fruhstorfer), (labeled "*fulgida* det. Melichar") (WIEN); S. Celebes, Bua-Kraeng, 5,000 ft [1,524 m], M, Feb.,1896 (H. Fruhstorfer) (labeled "*fulgida* det. Melichar") (HNHM), here designated.

Diagnosis: Head and thorax light green, mesonotum with orange along sides. Tegmina light green, bulla deep red, membrane shaded lightly with red basally, apically with 3 dark lines in pattern that is typical in the genus, slight infuscation along submarginal line of crossveins. In comparison with *C. maria* frons slightly narrower (see measurements); black lines on tegmen slightly wider with margins not as sharply defined. Lectotype genitalia (Fig. 23) with dorsal process of aedeagus similar to that found throughout the genus.

Measurements (lectotype M). Length: Overall 16.0; v 0.75; f 1.33; p 0.83; m 2.41; t 13.28, pcl 4.65. Width: v 0.75, f 0.66; t 8.13. Hind leg spine formula: 2:7:3 (in pad of minute spines).

Specimens examined: Not collected during Project Wallace. SULAWESI SELATAN: Samanga, lectotype M; Patuhuang, paralectotype M (WIEN); Bua Kraeng, paralectotype M (HNHM). The syntype (? F) from SULAWESI UTARA: Bantimoerang, cited by Melichar, 1901: 221, was not located.

15.2. *Cerynia maria* (White) (Fig. 22)

Poeciloptera maria White, 1846: 25, Fig. 3 [sp. nov.]. Lectotype: male, 45/107, Silhet (BMNH), here designated.

Cenestra maria: Breddin, 1901: 34, [Celebes, Tolitoli].

Cerynia maria: Melichar, 1901: 220, pl. 2, Fig. 13 [illustrated]; Metcalf, 1957: 98 [catalog].

Diagnosis: Black markings on tegmen arranged in characteristic pattern of the genus: (1), short diagonal bar originating at apex of clavus, (2), short curved bar parallel to submarginal line and slightly basad of crossveins, (3), elongate oblique bar crossing apex of tegmen, neither reaching costal margin nor diagonal claval bar 1; tegmen normally colored white, dusted with waxy powder, bulla pink or red. Considerable variation exists in extent of red coloration and infuscation of apical margin. The lectotype genitalia are illustrated (Fig. 22).

Measurements (lectotype M). Length: Overall 16.0; v 0.75; f 1.37; p 0.83; m 2.32; t 14.77, pcl 4.32. Width: v 0.75, f 0.83; t 7.80. Hind leg spine formula: 2:8:4 (in pad of minute spines).

Specimens examined: Not collected during Project Wallace. SULAWESI UTARA: Tolitoli. This record of Breddin 1901:30, needs confirmation, as the specimens he listed were not found. Presence of *C. maria* in Sulawesi would be an extension beyond normal distribution range in Southeast Asia.

Taxonomic note: In females, I have distinguished *C. maria* by using shape of valvulae III, which apically are about twice wider than seen in *C. fulgida*.

Tribe SELIZINI Distant

16. Genus *Seliza* Stål

Seliza Stål, 1862a: 312 [gen. nov.]; Metcalf, 1957: 404 [catalog].

Type species: *Poeciloptera vidua* Stål, original designation.

Diagnosis: Head conical, no margin between frons and vertex, posterior transverse carina strong, delimiting triangular area next to pronotum above each eye, ocelli weak or lost. Median dorsal carina on frons short, lateral carinae at maximum width of frons sharply raised; pronotum sloping upward from anterior to posterior margin, mesonotum convex anteriorly, disc flat, scutellum elevated, aligned with basal claval margins of tegmina; postocular eminence of pronotum conical. Tegmen with 3 longitudinal veins (R,S,M), vein S displaced basally against M by strong bulla, vein Cu extending adjacent to claval suture, crossvein M-Cu oblique, claval vein A2 strongly elevated, clavus heavily pustulate basally along vein A2 and in membrane, pustules absent in smooth medial area basad of thick, ridgelike Y-stem. Postclaval sutural margin strongly convex, with about 10 relatively long crossveins reaching margin, about 20 terminal veins along convex apical margin, submarginal line of crossveins, only 2-3 terminal veins forked in submarginal area. Female segment X small, oval; valvulae I heavily sclerotized and bladeliike, valvulae III bulbous, small teeth along apical margin.

Distribution: Southeast Asia, Indomalayan Region.

16.1. *Seliza vidua* (Stål)

Poeciloptera vidua Stål, 1854: 248 [sp. nov.]; Medler, 1986d: 336 [holotype female].

Holotype: female, MALACCA (NRS). Plesiotype: male, BRUNEI, Bukit Retak (BMNH), here designated.

Seliza vidua: Stål, 1862a: 312 (combined); Melichar, 1902: 137, pl. 7, Fig. 11 [illustrated]; Metcalf, 1957: 410 [catalog].

Diagnosis: Color dark brown to black, morphological characters as described for genus. This species easily recognized by shape of tegmina, which appear constricted between base of clavus and postclaval sutural margin, and concave along costal margin at point of R+C junction.

Measurements (plesiotype M, F from Dumoga-Bone National Park, Station 23, IRSN). Length: Overall 8.00, 8.00; v 0.50, 0.50; f 1.00, 1.08; p 0.46, 0.46; m 1.70, 1.74; t 6.64, 6.81; pcl 1.83, 1.66. Width: v 0.75, 0.66; f 1.00, 0.91; t 2.82, 2.99. Hind leg spine formula: 2:7:7, 2:7:8.

Specimens examined: SULAWESI UTARA: Dumoga-Bone National Park: Edward's Camp, 664 m, V.1985, M, at light (Martin) (BMNH 1985-10); Picnic Site, Sta. 23, F, 12.X.1985 (Bosmans & Van Stalle), IRSN 26.977. SULAWESI TENGAH: Lake Lindu, 900 m, 1°18'S, 120°05'E, 1-5.I.1966, F, malaise trap, (Straatman) (BPBM). SULAWESI: (no data), F, (Piepers) (RNHL). BRUNEI: plesiotype M, Bukit Retak, 1,440 m, (Sutton) (BMNH).

Taxonomic note: My study of male specimens of *S. vidua* from Hong Kong, Borneo and Philippines revealed uniformity in genital characters. However, genitalia of specimens from Sumatra and Java represented an undescribed species.

17. Genus *Microliza* Medler, gen. nov.

Type species: *Microliza epicis* Medler, here designated.

Diagnosis: Head in profile strongly convex, margin between frons and dorsum of head convex, median carina of frons extended onto vertex; transverse dorsal carina at base of head connecting genal margins above eyes, medially concealed by front margin of pronotum, small triangular lateral remnants of vertex adjacent to carina posteriorly. Disc of pronotum flattened, surface uneven, postocular eminence small, conical, nipplelike. Two longitudinal veins (R+S, M), with R+S stem short, vein S with one fork only, cell S open to costal margin, vein R united apically with C, forming closed cell, at which point tegmen is constricted concavely. Submarginal line forming relatively narrow submarginal area, several terminal veins forking at the submarginal line. Base of clavus elevated, postclaval margin convexly elevated. Thinly scattered pustules on membrane of tegmina, mostly in costal area. Female genitalia adapted for piercing; valvulae I sclerotized, bladeliike; valvulae III with 4-5 small teeth along apical margin. Metatibial preapical lateral spine: 1.

Distribution: Sulawesi, Philippines, Indomalayan Region.

17.1. *Microliza epicis* Medler, sp. nov. (Figs 21, 29)

Diagnosis: Morphology as given for genus. Head shown in profile (Fig. 29). Color overall blackish brown, clypeus and ventral aspect of thorax light brownish stramineous, legs slightly darker brown; tegmen membrane lighter brown in discal area, costal margin light brown to white, dark brown pustules clustered in basal area of clavus and scattered sparsely on tegmen. Holotype genitalia illustrated (Fig. 21).

Measurements (holotype M). Length: overall 9.5; v 0.21; f 0.91; p 0.50; m 1.66; t 7.64; pcl 2.49. Width: v 0.66; f 1.04; t 3.49. Hind leg spine formula: 1:6:6.

Holotype: Male, SULAWESI UTARA: Dumoga-Bone National Park: Edward's Camp, 664 m, V.1985, at light. BM 1985-10. Deposited in BMNH.

17.2. *Microliza desiris* Medler, sp. nov. (Fig. 28)

Diagnosis: Morphological characters same as given for genus. Size slightly smaller and head profile slightly more oval (Fig. 28) than seen in *M. epicis*. Tegmen ivory white in basal half, faint tinge of light brown basally, remnant of what may have been heavier infuscation, apical half of tegmen entirely dark brown except few small light patches near costal margin. Mesonotum brown dorsally, head and pronotum much lighter color, as also ventral side of thorax and legs. Valvulae III with 5 uniformly small teeth on apical margin.

Measurements (holotype F). Length: overall 8.5; v 0.29; f 0.75; p 0.46; m 1.66; t 6.14; pcl 1.66. Width: v 0.58; f 0.91; t 3.15. Hind leg spine formula: 1:6:6.

Holotype: Female (right tegmen lost), PHILIPPINE ISL: Mindanao: Butuan, Baker coll. (USNM).

17.3. *Microliza calixis* Medler, sp. nov. (Fig. 30)

Diagnosis: This species resembles *M. desiris* from the Philippines, but differs in profile of head (Fig. 30) and brown and white pattern of markings on tegmina. Head and mesothorax brown, pronotum brown laterally, white medially; clypeus, body ventrally, and legs, stramineous. Tegmina ivory, broad brown band across middle third and 5 rectangular brown spots alternating with 4 white spots in submarginal area. Median band constricted to give appearance of two triangular patches uniting at center of disc, centers of 12-15 small cells in preapical area diffused brown, postclaval margin brown. Small white pustules scattered in precostal margin and apical part of clavus. Valvulae III with 4 uniformly small teeth on apical margin.

Measurements (holotype F). Length: overall 8.5; v 0.25; f 0.83; p 0.50; m 1.74; t 6.64; pcl 1.83. Width: v 0.62; f 0.91; t 2.99. Hind leg spine formula: 1:5:6.

Holotype: Female, Borneo [KALIMANTAN TIMUR], Mahakkam [Mahakan Riv, 0° 35' S 117° 17' E], 1894, coll. Dr. Nieuwenhuis, Borneo Exped. (RNHL).

Acknowledgments

I wish to express appreciation to R. Bosman and J. Van Stalle, A.H. Kirk-Spriggs, and J.H. Martin and M.R. Wilson, who kindly made available the specimens of Flatidae from the Project Wallace Expedition. This report is Number 88 of a series on Project Wallace. I am deeply grateful to curators of depository museums for their cooperation and help in providing type material and other specimens for my study. This research was made possible in part by facilities provided by the J. Linsley Gressitt Center for Research in Entomology. I am pleased to acknowledge help given by professional and technical staff of the Bishop Museum during the course of my work.

I especially thank S. E. Miller, N. L. Evenhuis and L. B. O'Brien for reading the manuscript and providing helpful comments.

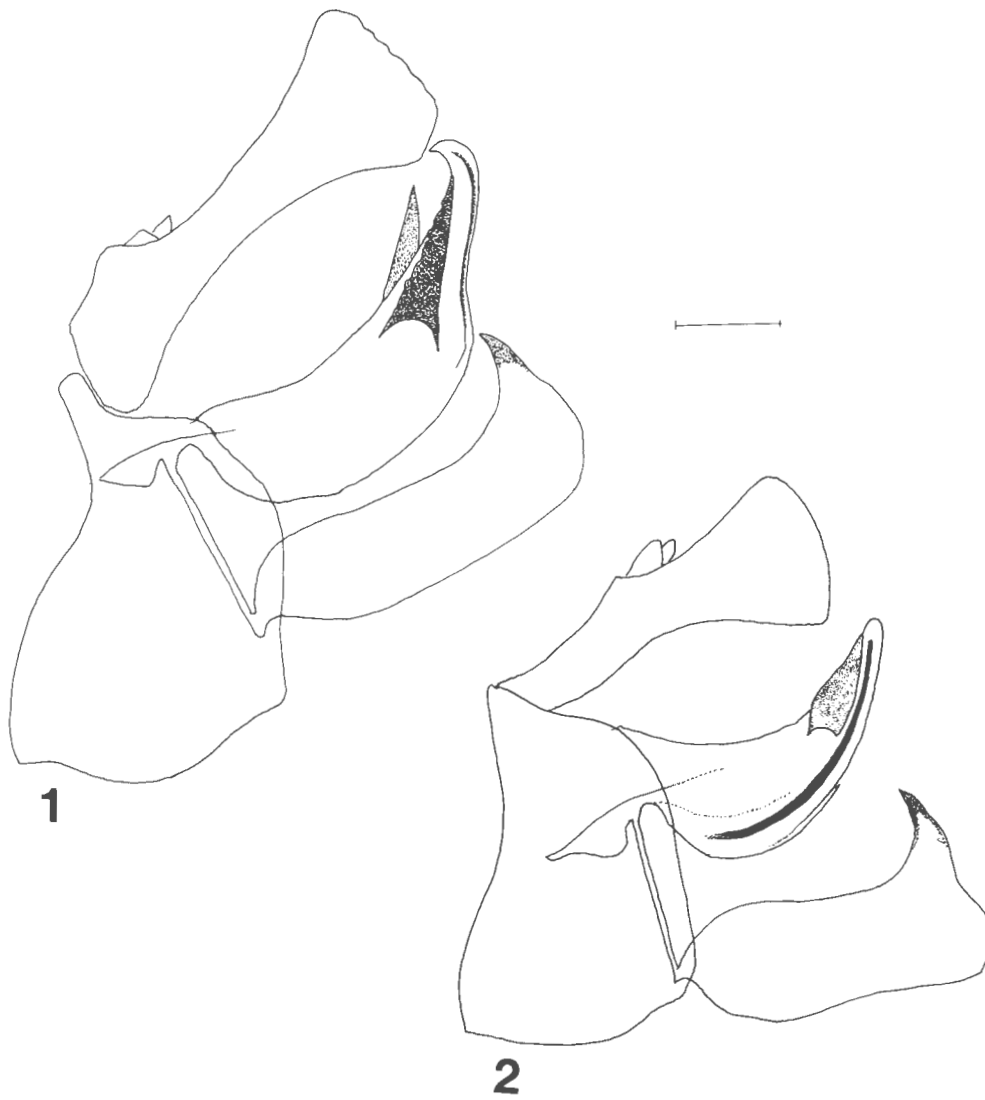
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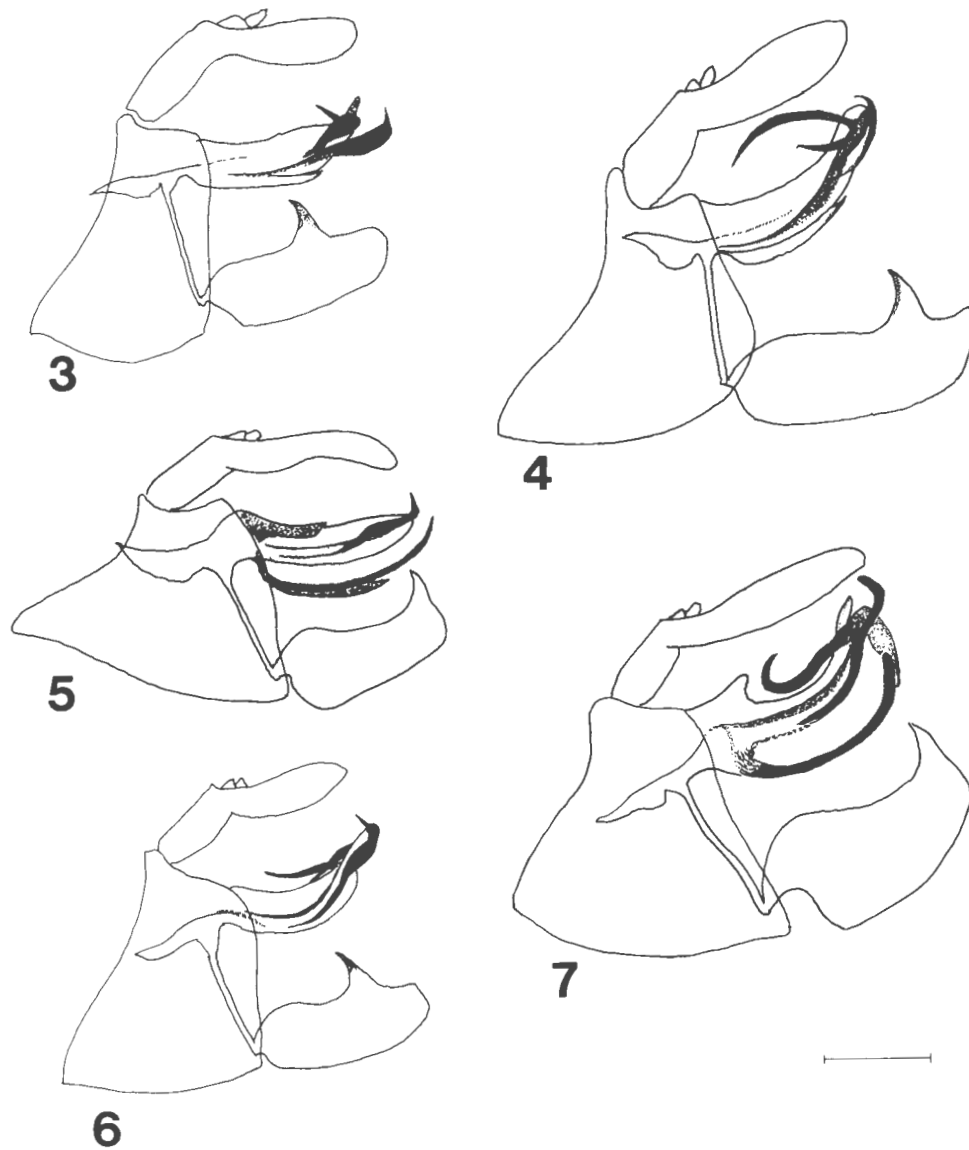
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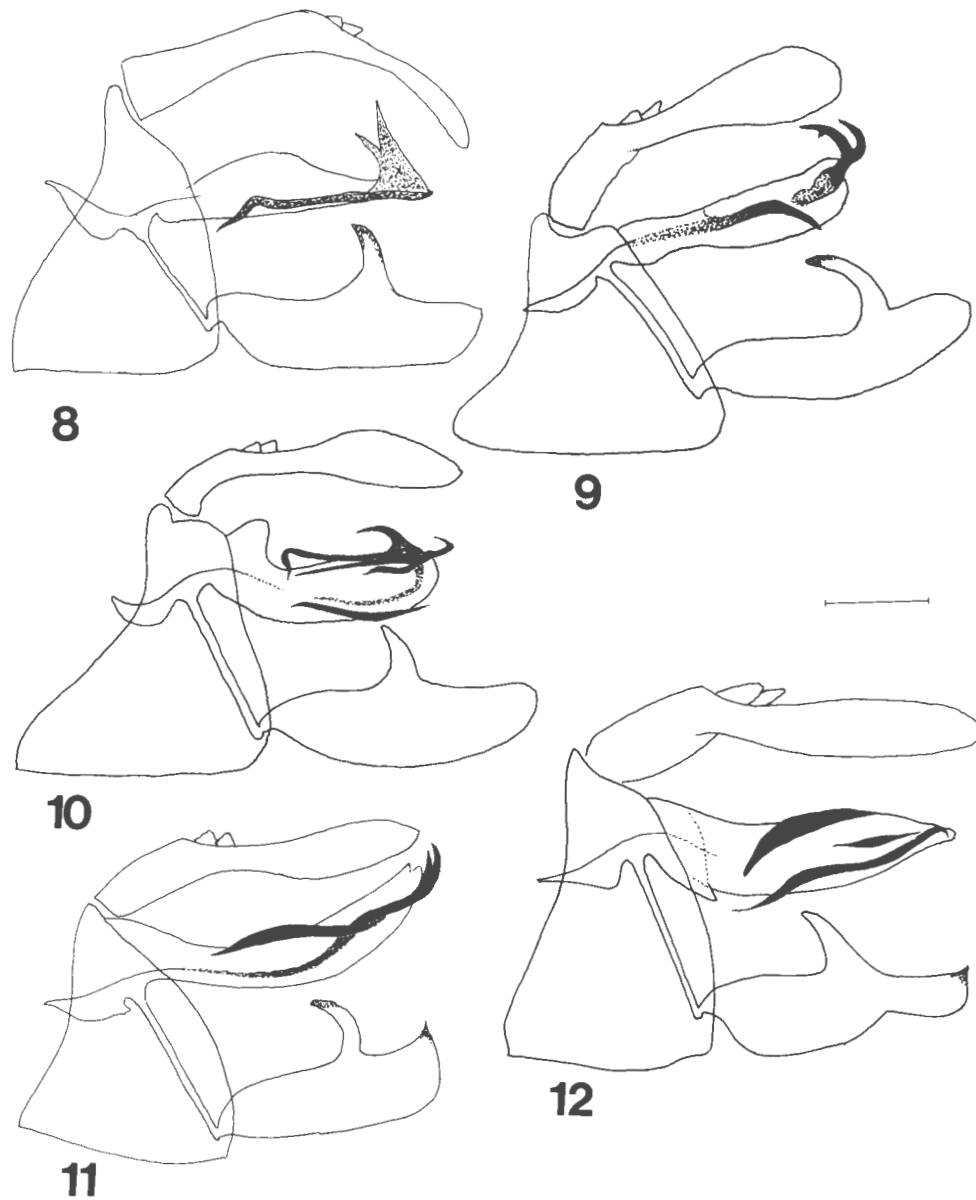
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Lawana Distant 30
Lawanini Melichar 29
Lechaea Stål 5
Lecopia Medler 10
lurida (Melichar), *Lecopia* 13
luteofasciata (Melichar), *Poeciloflata* 9
maculata (Melichar), *Miniscia* 23
maria (White), *Cerynia* 30
micholitzi (Jacobi), *Sabaethis* 20
Microliza Medler 32
minica Medler, *Somisha* 18
Miniscia Medler 22
modesta (Donovan), *Poeciloflata* 9
Nephesini Melichar 10
nigritans Medler, *Nullina* 22
Nullina Medler 21
philippinus (Stål), *Cerfennia* 26
Phromniini Distant 5
Phyllyphanta Amyot & Serville 28
Phyllyphantini Melichar 27
Poeciloflata Melichar 8
producta (Spinola), *Phyllyphanta* 28
pyralis (Guerin-M), *Atracis* 26
Rabocha Melichar 26
retarda Medler, *Somisha* 16
roseda Medler, *Lecopia* 12
roseovenosa (Melichar), *Circumdaksha* 8
rubropunctata (Melichar), *Circumdaksha* 7
rufosparsa (Distant), *Circumdaksha* 7
rufomarginata Melichar, *Sephena* 13
Sabaethis Jacobi 20
Salurnis Stål 27
Seliza Stål 31
Selizini Distant 31
sinensis Walker, *Cromna* 29
Sisciini Melichar 22
solennis (Melichar), *Atracis* 25
Somisha Medler 14
spumans (Breddin), *Somisha* 19
subflava (Melichar), *Sabaethis* 21
subjecta (Walker), *Lecopia* 11
sulawesiensis Medler, *Acutisha* 19
testacea (Melichar), *Poeciloflata* 9
uniformis (Melichar), *Lecopia* 12
viridana (Donovan), *Poeciloflata* 9
vidua (Stål), *Seliza* 31



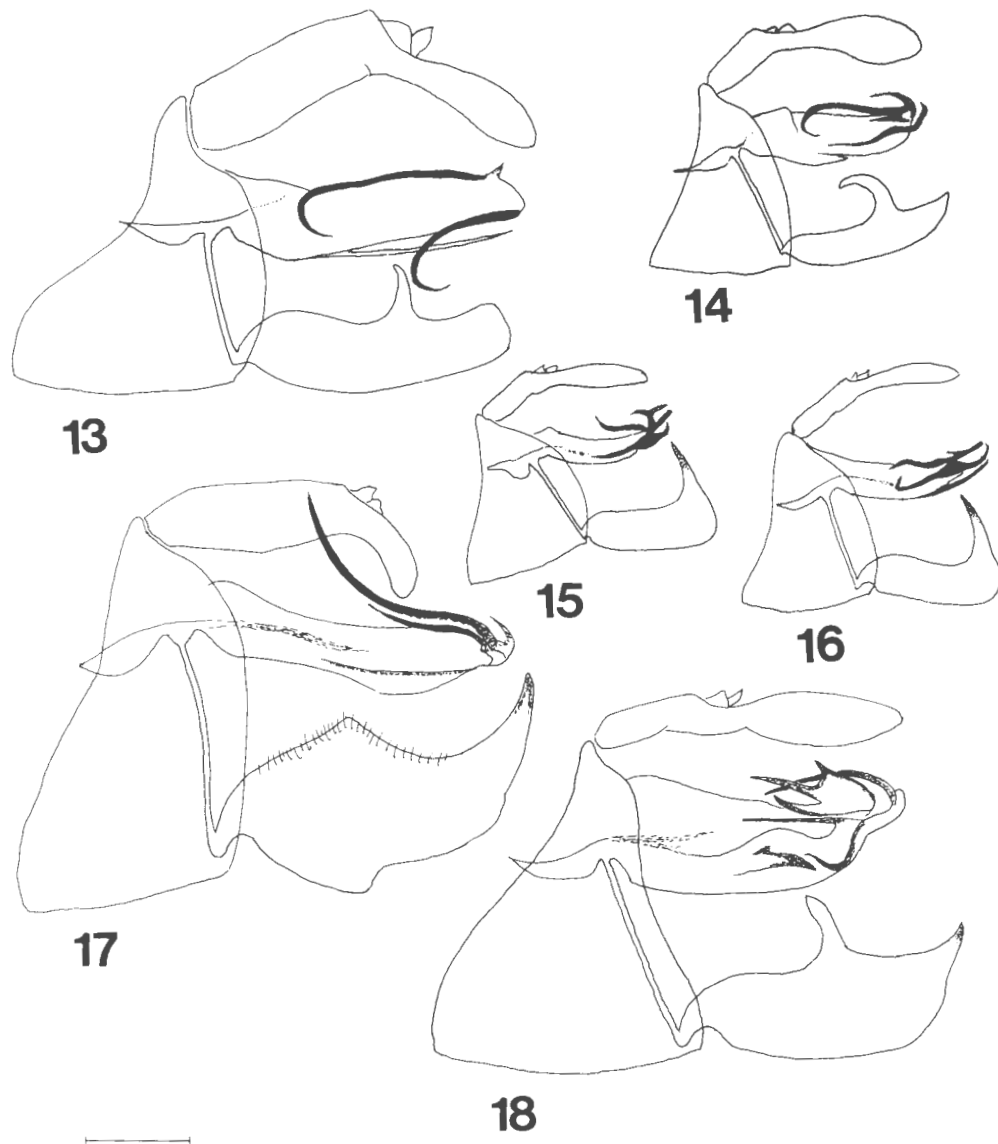
Figs. 1-2. Left lateral view of male genitalia of: 1, *Circumdaksha chloroleuca* (Walker); 2, *Lechaea aurantiomaculata* Melichar (Junior synonym of *Circumdaksha labeculata* (Distant)). -- Scale = 0.5 mm.



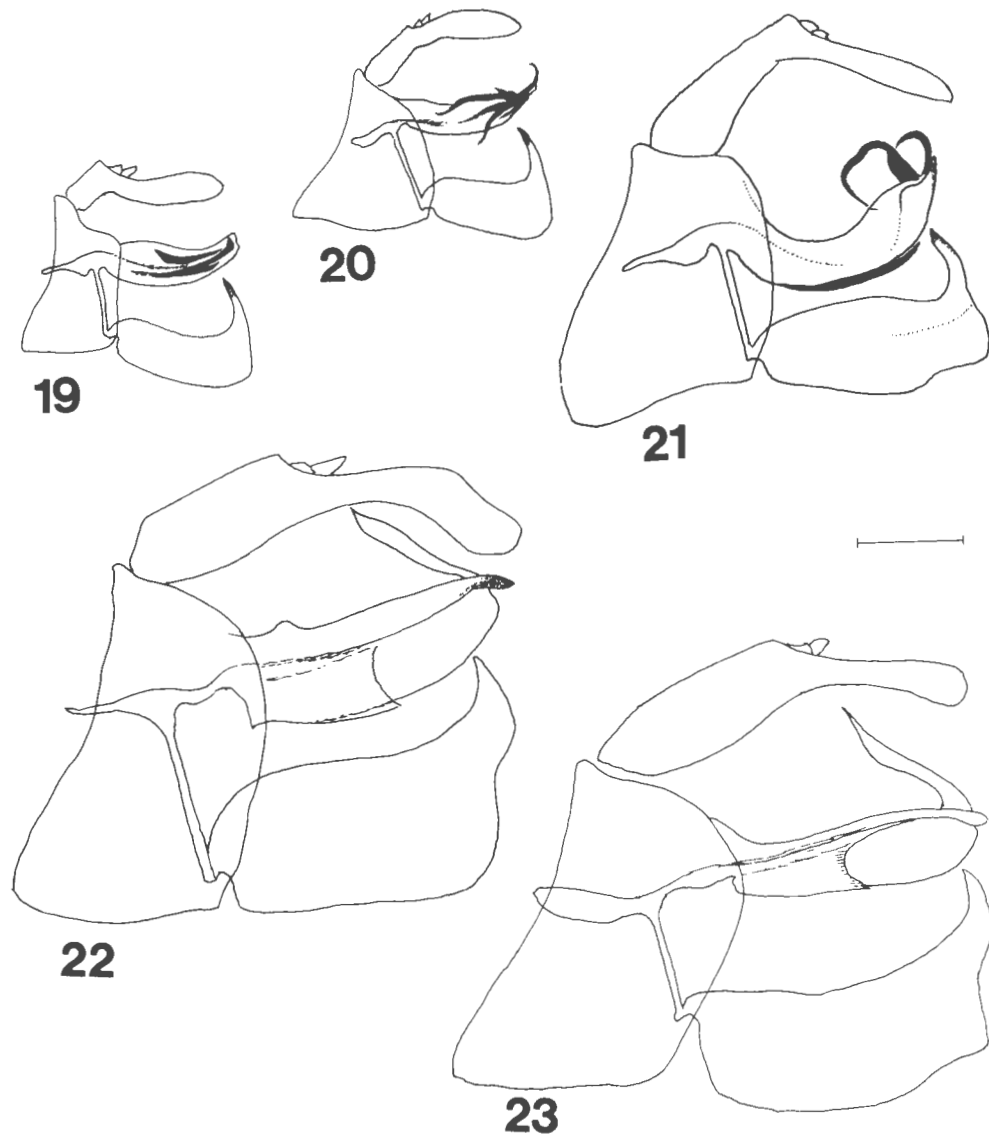
Figs. 3-7. Left lateral view of male genitalia of: 3, *Lecopia uniformis* (Melichar); 4, *L. extensa* Medler; 5, *L. alabasta* Medler; 6, *L. lurida* (Melichar); 7, *L. roseda* Medler. -- Scale = 0.5 mm.



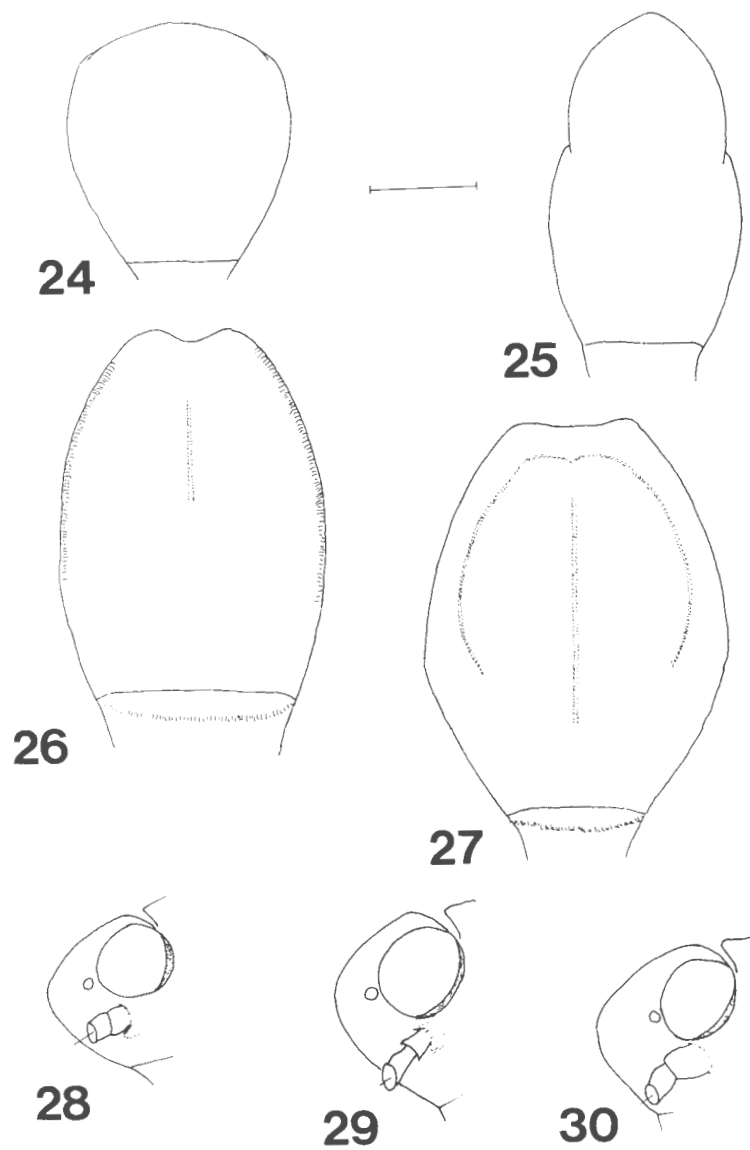
Figs. 8-12. Left lateral view of male genitalia of: 8, *Somisha calochroma* (Walker); 9, *S. dilura* Medler; 10, *S. conmela* Medler; 11, *S. retarda* Medler; 12, *S. imitacea* Medler. -- Scale = 0.5 mm.



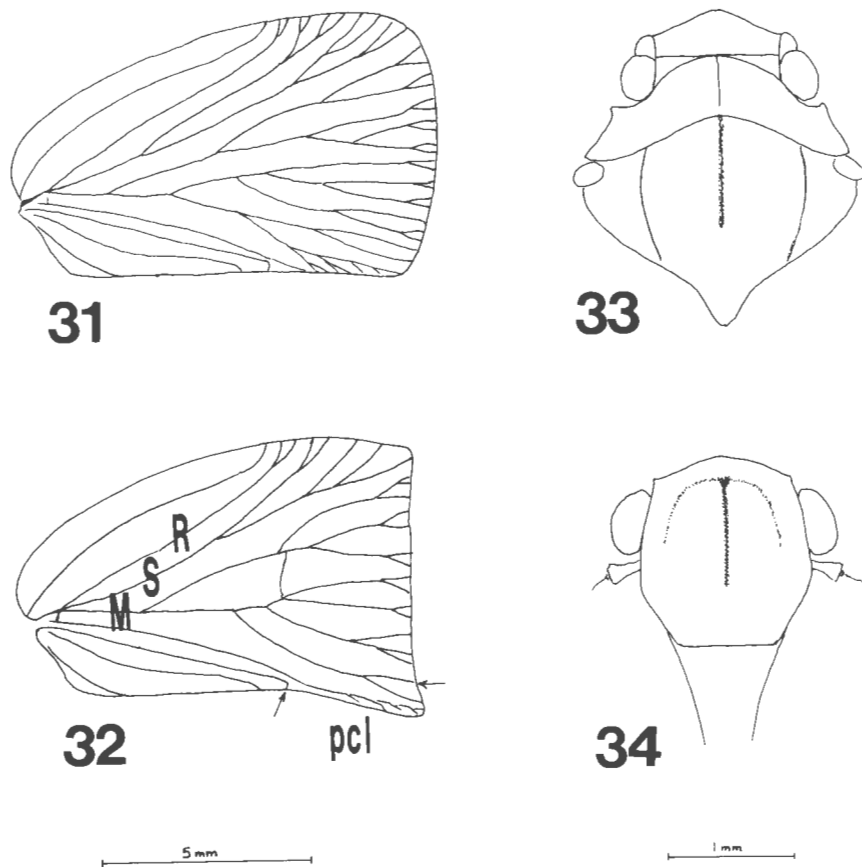
Figs. 13-18. Left lateral view of male genitalia of: 13, *Somisha electa* (Melichar); 14, *S. minima* Medler; 15, *Miniscia adera* Medler; 16, *M. maculata* (Melichar); 17, *Phyllyphanta producta* (Spinola); 18, *Acutisha sulawesiensis* Medler. -- Scale = 0.5 mm.



Figs. 19-23. Left lateral view of male genitalia of: 19, *Miniscia fortunata* Medler; 20, *Miniscia decapita* Medler; 21, *Microliza epicis* Medler; 22, *Cerynia maria* (White); 23, *Cerynia fulgida* Melichar. -- Scale = 0.5 mm.



Figs. 24-30. Frons; profile of head of: 24, *Miniscia maculata* (Melichar); 25, *Miniscia fortunata* Medler; 26, *Atracis pyralis* (Guérin-Ménéville); 27, *Atracis crenata* Medler; 28, *Microliza desiris* Medler; 29, *Microliza epicis* Medler; 30, *Microliza calixis* Medler. -- Scale = 0.5 mm.



Figs. 31-34. Right tegmen of: 31, *Somisha dilura* Medler; 32, *Somisha electa* (Melichar). R = radius, S = sector, M = media, pcl = postclaval sutural margin. -- Scale = 5 mm. 33-34, *Somisha electa* (Melichar), dorsal view of head and thorax; frontal view of head. -- Scale = 1.0 mm.

BOOK REVIEW

MAYFLIES AND STONEFLIES: LIFE HISTORIES AND BIOLOGY. Proceedings of the 5th International Ephemeroptera Conference and the 9th International Plecoptera Conference. Edited by Ian C. Campbell. Series Entomologica No. 44. Published by Kluwer Academic Publishers, Dordrecht, The Netherlands. ISBN No.0792302893. Published December 18, 1989. 366 pages. Price Dfl. 300.00, US\$ 154.00, UK £99.00.

This book is based on papers presented at the 5th International Ephemeroptera Conference and the 9th International Plecoptera Conference held together at Marysville, Australia from 18th to 24th February 1987. Sixty-two participants from 21 countries participated in the conferences. The 44 papers included cover a broad spectrum of research on Ephemeroptera and Plecoptera, with emphasis on life-history, ecology, zoogeography, water quality, and to some extent, morphology, physiology, and taxonomy of these aquatic insects. According to the Editor's introductory note, all included papers are refereed prior to acceptance.

Papers from almost all zoogeographic regions have been included. Each article is well edited and printed. Although no coherent theme is detected, the topics covered are timely and important to understand the biologies of these insects and the role they play in aquatic ecosystems. The applied aspects, like their use in detecting water pollution, etc. have, however, not been stressed.

The printing and get-up of the book are excellent. The publication of this book is an important addition to the literature currently coming out on aquatic insects. It is recommended to all entomological libraries and entomologists, particularly those interested in aquatic entomology.

V. K. GUPTA