BOOK REVIEWS AND ANNOUNCEMENTS

SYSTEMATIC INDEX

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REVISION OF THE TRIBE PHYLLYPHANTINI IN THE ORIENTAL REGION, WITH DESCRIPTIONS OF NEW GENERA AND NEW SPECIES (HOMOPTERA: FLATIDAE)

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ABSTRACT. Oriental genera included in the tribe Phyllyphantini are *Geisha* Kirkaldy, *Neosalurnis* Distant, *Pulastya* Distant, *Phyllyphanta* Amyot & Serville, *Salurnis* Stål, *Unnata* Distant, and 4 new genera: *Amasha, Lasura, Umidena,* and *Saurana.* The tribe contains 29 valid species, including 17 new species: *Amasha abrupta, A. decepta, A. inepta, Neosalurnis bonenda, N. decalis, N. insignis, N. insula, N. teralis, Geisha fangi, Lasura separata, Salurnis dilina, S. estora, S. hesita, S. kryala, S. lastendis, Saurana aberrans, and Umidena bilinea.* New synonymy: *Colobesthes taprobana* Kirkaldy, junior synonym of *Pulastya acutipennis* (Kirby); *Salurnis formosanus* Jacobi, junior synonym of *Salurnis marginella* (G-M). New status: *Phyllyphanta dubia* Kirby, restored as a valid species of *Pulastya.* New combination: *Phyllyphanta albopunctata* Kirby transferred to *Cromna albopunctata* (Kirby). Keys and illustrations of the head, tegmen and male genitalia are presented to aid in determinations of the species.

Introduction

Phyllyphantini originally was proposed by Melichar (1923) as a subtribe for an assemblage of 21 species in 9 genera characterized by a more or less pointed conelike head. Metcalf's Catalogue (1957) listed all genera grouped by Melichar, and added *Cromna* Walker, *Meulona* Zia, and *Summanus* Distant, each monotypic. The status of 12 genera and 32 species in this catalog remained unchanged until Medler (1988b) published a preliminary report on reclassification of the subtribes of Flatini. Genera retained in Phyllyphantini at the tribal level were *Phyllyphanta* Amyot & Serville, *Pulastya* Distant, *Salurnis* Stål, and *Neosalurnis* Distant. Genera added were *Geisha* Kirkaldy, and *Unnata* Distant. The remaining genera were transferred to other tribes: *Cromna* Walker and *Neocromna* Distant to Lawanini; *Meulonia* Zia to Selizini; *Mimophantia* Matsumura, *Pulaha* Distant and *Summanus* Distant to Phantiini. *Paracromna* Melichar was left unassigned for the time being because flatids in the New World required future study.

This dismemberment and rearrangement of genera was largely the result of research on type specimens of species assigned by previous authors, and my comparative study of characters of male and female genitalia. Data showed clearly that the assemblage given by Melichar and Metcalf was an unnatural arrangement of several anomalous groups of genera.

In this revision, 4 new genera and 17 new species are added, which results in a total of 10 Oriental genera and 29 species in the tribe.

Methods

Distribution: The species of Phyllyphantini reviewed at this time are distributed throughout the Oriental Region, sensu Wallace (1876). There are 4 sub-regions; (1) Indian, (2) Ceylonese, (32) Indo-Chinese, and (4) Indo-Malayan. The majority of genera and species were recorded from the Indo-Chinese subregion, which comprises Burma, Thailand, Vietnam, and China south of the Palaearctic Region, together with islands of Hainan and Taiwan.

Measurements: To provide comparable morphometric data, all measurements are reported in mm according to the following standardized format: Length: Overall; v (vertex); f (frons); p (pronotum); m (mesonotum); t (tegmen); pcl (postclaval sutural margin); t (tegmen). Width; v (vertex); f (frons); t (tegmen).

The hind leg spine formula gives sequence of metatibial lateral spine (s): metatibial apical spines: metatarsal I basal spines.

Label Data: Two methods were used for presentation of label data because locality names may have changed subsequent to the time specimens were collected, especially those dated prior to WW II. Firstly, to help preserve the historical record, information from type specimens was recorded exactly as given on labels, and the depository museum named in full. Secondly, all other material was recorded by locality in alphabetical sequence with the museum indicated by its acronym in parentheses ( ). Dates on labels were transcribed to a consistent sequence of day, month, and year. Whenever practical, locality names given on these labels were translated to standard names found in Gazetteers of the Board on Geographic Names, Department of the Interior, Washington, D.C.

Acronyms of Depository Museums

BMNH = Natural History Museum, London, England.
BPBM = Bishop Museum, Honolulu, Hawaii, USA.
CAS = California Academy of Sciences, San Francisco, California, USA.
DSMT = Dresden Staatliches Museum fur Tierkunde, Dresden, Germany.
HAMB = Universitat Hamburg Zoologisches Institut und Zoologisches Museum, Hamburg, Germany.
HNHM = Hungarian Natural History Museum, Budapest, Hungary.
IRSN = Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.
ITZA = Instituut voor Taxonomische Zoologie, Amsterdam, Netherlands.
MCSN = Museo Civico di Storia Naturale, Genoa, Italy.
MNHN = Museum National d'Histoire Naturelle, Paris, France.
MNHU = Museum fur Naturkunde an der Humboldt Universitat, Berlin, Germany.
NCSU = North Carolina State University, Raleigh, North Carolina, USA.
NRMS = Naturhistoriska Riksmuseet, Stockholm, Sweden.
RNHL = Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.
USNM = National Museum of Natural History, Washington, DC, USA.
WIEN = Naturhistorisches Museum, Vienna, Austria.

Tribe PHYLLYPHANTINI Melichar

Head more or less conical; pronotum with elevated carinate ridge extending from below eye to antero-ventral margin of lateral lobe; sutural angle of tegmen usually projecting acutely; 2 longitudinal veins comprising R+S, M or R, S+M arising from basal stem; if Cu forked, then Cu1 either obliquely joining M, or freely extending to apical margin; submarginal line of crossveins usually absent, or if present, then weak and irregular. Length overall normally 10-20 mm.

Key to genera of *Phyllyphantini*

1. One metatibial lateral spine. 2
   Two metatibial lateral spines. 6

2. Head conical, bluntly or acutely produced. 3
   Head not conical, shallowly convex or truncate. 4

3. Dorsum of head with sharp median carina. . . . . 1. **Phyllyphanta** Amyot & Serville
   Dorsum of head without median carina. . . . . 2. **Salurnis** Stål

4. Vertex not defined, frons convex in profile, extending to anterior margin of pronotum; frontoclypeal suture strongly arched. . . . . 3. **Unnata** Distant
   Frons and vertex defined by angulate or carinate margin between; frontoclypeal suture usually transverse. 5

5. Anterior margin truncate or nearly so, carinate margin between frons and vertex . . . . . 4. **Umidena,** gen. nov.
   Anterior margin of vertex slightly obtuse; without sharp carina between frons and vertex. . . . . 5. **Lasura,** gen. nov.

6. Tegmen with S+M arising from basal stem. . . . . 10. **Pulastya** Distant
   Tegmen with R+S arising from basal stem. 7

7. Vertex not defined, frons convex, reaching anterior margin of pronotum; or head conical. 8
   Vertex defined, separated from frons by distinct anterior margin. 9

8. Anterior margin of head shallowly convex; sutural angle approximately right angled. . . . . 6. **Geisha** Kirkaldy
   Anterior margin of head conical; sutural angle produced, acute. . . . . 7. **Neosalurnis** Distant

9. Dorsal margin of frons broadly U-shaped;, anterior margin of vertex thick. . . . . 8. **Amasha,** gen. nov.
   Dorsal margin of frons narrowly U-shaped; anterior margin of vertex thin . . . . . 9. **Saurana,** gen. nov.

1. Genus **Phyllyphanta** Amyot & Serville

Phyllyphanta Amyot & Serville 1843, p. 523; Metcalf, 1957, p. 180.
Type species: *Poeciloptera producta* Spinola, monobasic.
Phyllyphanta: Melichar, 1902, p. 54 [Also in part, misidentified *Cromna*].
Phyllyphanta: Distant, 1906, p. 414 [Also in part, misidentified *Lawana* and *Cromna*].

Diagnosis: Head pointed, conical, smooth except sharp dorsal carina on vertex; transverse basal carina of vertex only visible laterally above eyes. Frons longer than wide, without median carina, lateral margins with sharply carinate raised edges, widest where flared above antennal sockets. Pronotum slightly overhanging base of vertex, anterior margin with slight median concavity, sharp median longitudinal carina. Mesonotum wider than head including eyes, 3 longitudinal carinae, median carina raised on disc. Tegmen with sutural angle drawn out, pointed, costal angle obtusely convex, apical margin oblique from sutural margin apex to costal angle. Costal cell at bulla twice wider than precostal area, with network of crossveins; two longitudinal veins (R+S, M) arising from basal stem, R+S stem forking at bulla; Cu and M veins forked at same plane; margins of tegmen with dark pigment spots between vein terminations; postclaval sutural margin with 10-12 cells containing small black spots, spot at claval apex small. Female valvulae I bladelike, enclosed by valvulae III that have ventral margins lined with small spines. Metatibial spines 1:7 or 1:8.

Distribution: SE Asia, Indo-Malayan Subregion, Philippine Islands.

Taxonomic note: Species incorrectly assigned to *Phyllyphanta*, sensu Metcalf, 1957, have been disposed as follows:

Phyllyphanta albidosparsa Distant, 1910b, p. 329. See *Cromna acutipennis* Walker. (Medler, 1990).

Phyllyphanta albopunctata Kirby, 1891, p. 156. See *Cromna albopunctata* (Kirby). NEW COMBINATION.

Phyllyphanta andamanensis Distant, 1906, p. 414. See *Cromna andamanensis* (Distant). (Medler, 1990).

Phyllyphanta angulifera (Walker), 1858, p. 57. See *Cromna angulifera* Walker. (Medler, 1990).

Phyllyphanta bipunctata (Walker), 1862, p. 312. See *Salurnis bipunctata* (Walker). (Medler, 1990).

Phyllyphanta birarae Kirkaldy, 1905, p. 335. See *Colgar chlorospilum* (Walker). (Medler, 1989).

Phyllyphanta cereris (Stål), 1854, p. 247. See *Cromna sinensis* (Walker). (Medler, 1986c).

Phyllyphanta hyalinata Stål, 1859, p. 282. See *Colgar peracuta* (Walker). (Medler, 1986c).

Phyllyphanta sinensis (Walker), 1851, p. 451. See *Cromna sinensis* (Walker). (Medler, 1990).

Phyllyphanta sinensis var. *gracilis* Melichar, 1902, p. 56. See *Neosalurnis gracilis* (Melichar). (Medler, 1986c).

Key to species of *Phyllyphanta*

Vertex acutely conical, tegmen sutural angle acute, prolonged. . . . . 1.1. **producta** (Spinola)

Vertex broadly triangular, tegmen sutural angle nearly right angled, scarcely prolonged. . . . . 1.2. **declivis** (Jacobi)

1.1. **Phyllyphanta producta** (Spinola) (Fig. 1-4)

Poeciloptera producta Spinola 1839, p. 432; Medler, 1991, p. 28. Neotype, M, Batavia, Copenhagen Mus.
Phyllyphanta producta: Amyot & Serville, 1843, p. 523; Metcalf, 1957, p. 184.
Poeciloptera producta Walker, 1851, p. 452; Medler, 1990, p. 155. Holotype, M, (unknown locality), London Mus.
Lawana parcisparsuta Jacobi, 1941, p. 288; Medler, 1986a, p. 110. Holotype, M, Sumatra, Dresden Mus.
Lawana verticiplana Jacobi, 1941, p. 288; Medler, 1986b, p. 52. Holotype, M, Sumbawa, Berlin-Humboldt Mus.
Poekilloptera walkeri: Metcalf, 1955, p. 263 [n. name for *Poeciloptera producta* Walker, not *Poeciloptera producta* Spinola].

Diagnosis: Morphological characters in general same as given for genus. Head acutely pointed, angled at 70° (Fig. 2); frons elongate, widest above antennae (Fig. 3); tegmen postclaval sutural margin extended from apex of clavus at angle of 160 °, meeting apical margin at angle of 65°; vein Cu forked on same plane as fork in vein M; Cu1 entering apex of clavus, Cu2 extending to apical margin (Fig. 1); anal veins not uniting in Y-stem. Color light green, yellow green or faded to ochraceous. No markings other than thin, elongated, interveinal black dashes positioned just inside margins of tegmen; edge of margin often tinged faintly pink; bulla sometimes black.

Illustration of neotype genitalia (Fig. 4) shows different relative lengths of 2 pairs of processes arising dorso-apically from shaft of aedeagus.

Measurements (M, F, Telok Ayer (BPBM)): Length: overall 17.5, 19.0; v 0.83, 1.00; f 2.16, 2.16; p 0.83, 0.83; m 2.49, 2.82; t 10.13, 10.96; pcl 2.99, 3.49. Width: v 1.00, 1.00; f 1.33, 1.33; t 6.47, 6.97. Hind leg spine formula: 1:7:7, 1:7:7.

Specimens examined: COCHINCHINA [SOUTH VIETNAM]: M (Signoret) (*sinensis* det Signoret, *producta* det. Melichar) (WIEN). INDIA: ANDAMAN ISL: Port Blair, M (Roepskorff) (Copenhagen); Port Blair, F (Gigliolugi) (MCSN). INDIA: Bengale, F, 1815 (Diard & DuVaucel) (MNHN). INDONESIA: JAVA: F, (Signoret) (*producta* det Signoret, det Melichar) (WIEN); F, 60-15 (Horsfield) (BMNH); Batavia [Djakarta], neotype M, xii.1815 (Westermann) (Copenhagen); Buitenzorg [Bogor], F, 8.ii.1882 (Oudemans) (ITZA); Semarang, teak forest, 2 F, 26.i.1931 (Kalshoven) (RNHL). INDONESIA: KALIMANTAN: Balikpapan, M, Acc.1959 (Hardonk) (ITZA); Barabei [Barabai], F, 1883 (Pool) (ITZA); Sengeoigi, Kelongai Mt., F, viii.1894 (Moret) (RNHL). INDONESIA: MOLUCCAS: Amboina [Ambon], F, (HNHM). INDONESIA: SULAWESI [Celebes]: Tolitoli, F. (HNHM); Tolitoli, M, xi-xii.1895 (Fruhstorfer) (WIEN). INDONESIA: SUMATRA: F, M (Weber) (AMNH); M, 1887 (WIEN); holotype M (*parcisparsuta* Jacobi) (DSMT); Laut Tador, SE coast, 90 m, 2 F, 20.viii.1950 (Straatman) (RNHL); Medan, 2 F, 1.v.1920, 10.vi.1921 (Corporaal) (ITZA); Padang, F (v. d. Goot) (ITZA); Rembang, Tjepoe, M, 2.viii.1925, 199 (Verbeek) (ITZA). MALAYSIA (EAST): SABAH: Banguey Isl [Banggi Pulau], M, 20.vii.1894 (Kedenburg) (HAMB); Danum Valley, 70 km W. Lahad Datu, next to Nature Trail bridge, 150 m, F, 1.xii.1989 (M. & J. Duffels) (ITZA); Keningan [Keningau], M, 12-17.i.1959 (Maa) (BPBM); Mengalum Isl, 35 mi NW Jesselton [Kota Kinabalu], 8-15.vii.1928 (Kloss) (BMNH); Pengeran, Martapoera, Ragoeman, on citrus, F, 18.V.1930 (Franssen) BM

1948-536 (BMNH); Tawau, C.R.S. Quoin, M, iv.1962 (Conway) (BPBM); Tuaran, 35 km E of Jesselton [Kota Kinabalu], M, 25.iii.1968 (Hardy) (BPBM). MALAYSIA (EAST): SARAWAK: Bidi, F, 1907-1908 (Brooks, BM 1936-681) (BMNH); Kuching, Santubong, 797-1500 m, F, 18-30.vi.1958 (Maa) (BPBM). Mulu Mt. Natl Park [Gunong Mulu], 70 m, M, iii.1978 (Holloway) (BM 1978-206) (BMNH); Ong Tiang Swee Road, F, 18.5.1966, at light (Rothschild) (BMNH); Simanggang, on citrus, F, 13.ix.1963 (Kuch, BM 1974-1) (BMNH); Telok Ayer, 2 M, 5 F, (Muir) (BPBM). MALAYSIA (WEST): Kuala Selangor, M, 30.ix.1916 (*Phyllyphanta sinensis,* BM 1955-354) (BMNH); Penang Isl, M, 9322 (Baker) (BPBM). PHILIPPINES: Palawan Isl, nr Puerto Princessa, F, iii.1945 (Blakemore) (CAS); Palawan Isl, Irawan, 14 km W Puerto Princessa, M, 24-29.xi.1965 (Davis) (USNM). SINGAPORE, 2 M, 9323 (Baker) (BPBM); F, 1904-101 (Ridley) (BMNH).

Taxonomic note: In his catalog of the Spinola Collection, Casale (1982) recorded *Poeciloptera producta* Spinola, Java, Serville Collection. However, the Spinola Collection in Museo Turin contains only a female acanaloniid labeled "Bresil, Thorey, 18.ix.80." As the locality and date do not agree with the original description, this specimen has non-syntype status.

According to Horn and Kahle (1935), specimens from the Serville Collection were passed on to Signoret at the Vienna Natural History Museum. Melichar (1902) cited "Signoret's type in Wien." However, a search by Dr. A. Kaltenbach in response to a request by Dr. L. O'Brien (1988) did not reveal a recognizable specimen of Serville's *producta.* I also searched without success for a syntype of *producta* during my visit at Vienna and Paris in 1988.

There seems no doubt that the type of *Poeciloptera producta* Spinola is lost, or no longer in existence. Therefore, a male specimen, Batavia, Dec 1818, Westerman Mus, deposited in the Copenhagen Museum, was designated NEOTYPE by Medler, 1991, p. 28. The neotype genitalia are reproduced (Fig. 4) to facilitate recognition of the species.

1.2. **Phyllyphanta declivis** (Jacobi) (Fig. 5-6)

Lawana declivis Jacobi, 1941, p. 289; Metcalf, 1957. p. 210; Medler, 1986a, p. 108; 1986b, p. 47. Lectotype, F, Sumbawa, Berlin-Humboldt Mus. Plesiotype, M, Thailand, Blangkassi, Leiden Mus.

Phyllyphanta declivis: Medler, 1986a, p. 108; 1986c, p. 47.

Diagnosis: Head angled obtusely at 115°. Tegmen postclaval sutural margin extended from claval apex at 175° angle, meeting apical margin at angle of 80° (Fig. 6). Overall color dark green except when faded to testaceous; 2 oblique yellowish bands across tegmen sometimes present. Black marginal markings conforming with pattern in the genus. The plesiotype genitalia are illustrated (Fig. 5).

Measurements (plesiotype M, lectotype F): Length: overall 13.5, 9.5; v 0.54, 0.33; f 1.66, 1.33; p 0.75, 0.66; m 3.15, 2.32; t 11.12, 7.80; pcl 3.98, 2.49. Width: v 1.08, 0.83; f 1.33, 1.16; t 7.47, 4.65. Hind leg spine formula: 1:7:10, 1:8:9.

Specimens examined: BURMA: Shwcao Myo, M, x.1885 (Fea) (*Phyllyphanta sinensis* det. Melichar) (MCSN). INDONESIA: Sumbawa Besar, lectotype, F, 24.iv- 2.v.1927 (Rensch). (MNHU); paralectotype, F, same label as lectotype (DSMT). THAILAND:

plesiotype, M, Blangkassi, km 206, x-xi.1943 (Van Veen) (RNHL); Kamburi, F, iv (Fruhstorfer) (WIEN). VIETNAM (SOUTH): Nha Trang, F, 17-26.xi.1960 (Yoshimoto) (BPBM).

Taxonomic note: Although distinctly differing in size, the lectotype and paralectotype from Sumbawa appear to have similar morphological characters relative to specimens examined from Burma, Thailand and Vietnam. This anomaly in sizes and disjunct distribution pattern suggests that a species complex may exist. There is need to study additional material from the Sumbawa population, especially genitalia of a male.

2. Genus **Salurnis** Stål

Salurnis Stål, 1870, p. 773; Metcalf, 1957, p. 193. Type species: *Salurnis granulosa* Stål, monobasic.

Diagnosis: Head smoothly conical, variously angled from 70 to 145°, no dorsal longitudinal carina, transverse basal carina of vertex concealed by anterior margin of pronotum, only visible where joined to lateral carinae; frons without median carina, lateral carinae sharp and raised, flared laterad above antennal bases. Pronotum slightly overhanging base of vertex, anterior margin slightly concave medially, disc shallowly depressed; median longitudinal carina weak or absent, postocular eminence raised, triangular, ventral arm carinate, extending ridgelike to antero-ventral margin of lateral lobe; mesonotum with 3 or 4 longitudinal carinae. Tegmen with 2 longitudinal veins (R+S, M) arising from basal stem; costal cell at bulla twice wider than precostal area, with reticulated crossveins; vein Cu forked, Cu1 either oblique and united with M2, or extending to apical margin, Cu2 reaching apex of clavus; claval veins not united in Y-stem at apex of clavus, ladder like crossveins along claval suture; Color green or faded green orange, strongly contrasting patterns of dark brown or black spots in cells along postclaval sutural margin, usually much larger dark spot at apex of clavus; interveinal spots or dashes along costal, apical and sutural margins variable in size and dark color between species. Metatibial spines 1:6, 1:7 or 1:8,

Two types of female genitalia in the genus: valvulae III of *S. marginella* and related species outspread, showing pad of spines, basal margin extended clasplike along blades of valvulae I. In *S. bipunctata* and related species, valvulae III closely appressed, spines visible only on ventral margins, basal margins not strongly clasplike.

Distribution: Indo-Malayan and Indo-Chinese Subregions, Philippine Islands.

Key to species of *Salurnis*

1. Mesonotum with median longitudinal carina well defined; 1 lateral carina on each side of mesonotum. 4
   Mesonotum with median longitudinal carina absent or obscure; 2 lateral carinae on each side of mesonotum. 2
2. Head acutely conical, apex sharply pointed. . . . . 2.9. **kryala** Medler, sp. nov.
   Head obtusely conical, apex bluntly pointed. 3
3. Head obtuse, angled at 130°; hind leg spine formula 1:7:9. . . . . 2.8. **marginella** (Guérin-M)

Head only slightly obtuse, angled at 145°; hind leg spine formula 1:8:11
. . . . . 2.10. **lastendis** Medler, sp. nov.

4. Pro- and mesonotum uniformly green or stramineous. 9
Pro- and mesonotum with stripes or infuscated band. 5
5. Mesonotum with 3 green and 2 orange longitudinal stripes.
. . . . . 2.5. **dilina** Medler, sp. nov.
Mesonotum without green and orange longitudinal stripes. 6
6. Vein Cu1 oblique, united with vein M2 in short stem. 7
Vein Cu branched normally, Cu1 not united with vein M2. 8
7. Median brown band on pro- and mesonotum not edged with red; sutural margin not red basally (Philippine Isl.). . . . . 2.1. **granulosa** Stål
Median brown band of pro- and mesonotum edged with red, median carina strongly red; sutural margins red basally (Borneo).
. . . . . 2.2. **dulitana** Lallemand
8. Size 10 mm or less; Cu fork near apex of clavus, apicad of M fork.
. . . . . 2.3. **minuta** Lallemand
Size more than 10 mm; Cu and M forks at same plane near middle of clavus.
. . . . . 2.4. **hesita** Medler, sp. nov.
9. Vertex shallowly convex. . . . . 2.7. **estora** Medler, sp. nov.
Vertex obtusely conical. . . . . 2.6. **bipunctata** (Walker)

2.1. **Salurnis granulosus** Stål (Fig. 7-10)

Salurnis granulosa Stål, 1870, p. 774; Metcalf, 1957, p. 195; Medler, 1986c, p. 328. Holotype, M, Philippine Islands, Stockholm Mus.

Diagnosis: Morphological characters same as described for genus. Head acutely conical, angled at 60° (Fig. 7), frons elongate, widest above antennae (Fig. 9); vertex without median carina; tegmen postclaval sutural margin extended from apex of clavus at angle of 160°, meeting apical margin at angle of 55° (Fig. 8); costal cell at bulla twice wider than precostal margin, filled with many crossveins arising from vein R; vein Cu1 oblique, merging with vein M2; anal veins not uniting in Y-stem. The genitalia of a male from Agusan, Philippine Islands, are illustrated (Fig. 10).

Measurements (M, F, Agusan (BPBM)): Length: overall 11.5, 12.0; v 0.79, 0.75; f 1.99, 1.99; p 0.75, 0.79; m 1.99, 2.16; t 8.80, 9.63; pcl 2.82, 2.82. Width: v 0.83, 0.83; f 1.20; 1.20; t 5.48, 5.81. Hind leg spine formula: 1:6:7, 1:6:7.

Specimens examined: PHILIPPINES, MINDANAO: Agusan, Esperanza, 2 F, 4-11.xi.1959 (Yoshimoto) (BPBM); Agusan, S. Francisco, 10 km SE, M, 12.xi.1959 (Yoshimoto) (BPBM); Baraun, F, M (Baker) (USNM); Bihiran Isl, F (Baker) (USNM); Cotobato, M (Taylor) (USNM): Camarines Sur, Mt. Isarog, 500-600 m, M, 15.iv.1963 (Torrevillas) (BPBM); Dinawihan, Gingoog, 36 km E of Gingoog City, Misamis Or, 100-200 m, F, 30.viii.1965 (Torrevillas) (BPBM); Empagatao Mt, Misamis Or, 1050-1200 m, F, 19-30.iv.1961 (Torrevilas) (BPBM). PHILIPPINES, LEYTE: F, (Maasin) (San Carlos Univ); Ormoc, 5 km E, 200 m, M, 3-11.x.1965 (Davis) (USNM). PHILIPPINES, PALAWAN ISL: Tinabog, 3 km NE, F, 6.v.1962 (Holtmann) (BPBM);

Palawan, nr Puerto Princessa, F, v.1945 (Blakemore) (CAS). PHILIPPINES, SAMAR: F, M (Baker) (USNM). INDONESIA, MALACCA: holotype, F (Kinbergen) (*Poeciloptera fimbriolata* Stål) (NRMS).

2.2. **Salurnis dulitana** Lallemand (Fig. 18)

Salurnis dulitana Lallemand 1939, p. 72; Medler, 1987b, p. 37. Lectotype, F, Sarawak, Mt. Dulit, London Mus, here designated. Plesiotype M, Sarawak, Mt. Dulit, Brussels Mus.

Diagnosis: Closely related to *S. granulosus*; differs in slightly less acute shape of head and presence of red coloring on apex of head, pro- and mesonotum and margins of tegmen. Head angled at 85°; tegmen postclaval sutural margin extended from apex of clavus at angle of 160°, meeting apical margin at angle of 65°; costal cell at bulla twice wider than precostal margin, filled with many crossveins arising from vein R; vein Cu1 oblique, merged short distance with vein M2; then separated and extended to apical margin; anal veins not uniting in Y-stem. Illustration of paralectotype male genitalia (Medler, 1987b) is reproduced (Fig. 18).

Measurements (paralectotype M, lectotype F): Length: overall 12.0, 13.0; v 0.50, 0.60; f 1.66, 1.83; p 0.66, 0.75; m 2.32, 2.66; t 10.00, 10.62; pcl 3.00, 3.49. Width: v 0.83, 0.87; f 1.33, 1.33; t 6.00, 6.47. Hind leg spine formula: 1:6:7, 1:6:6.

Specimens examined: MALAYSIA (EAST), SARAWAK: Mt. Dulit, River Koyan, 2,500 ft. (760 m), lectotype F, 16.xi.1932 (Hobby & Moore) (BMNH); Junction Rivers Tinjar & Lejok, paralectotype F, 2.viii.1932, (Hobby & Moore) (BMNH); paralectotype M, same label as lectotype (IRSN); F, (No locality data) (Wallace, det. *Nephesa marginella*) (Museum of Victoria).

Taxonomic note: Known only from syntype specimens and a single female collected by Wallace deposited in the Museum of Victoria. The head shape, 3 mesonotal carinae and tegminal shape and markings are character states shared with *S. granulosa*, but apical processes of the aedeagus differ in the Philippine and Borneo taxa.

2.3. **Salurnis minuta** Lallemand (Fig. 11)

Salurnis dulitana minuta Lallemand 1939, p. 73; Medler, 1987b, p. 39. Lectotype, F, Sarawak, Mt. Dulit, Paralectotype F, same label as Lectotype, London Mus, here designated. Plesiotype M, Sabah, Liawan, Bishop Mus.

Diagnosis: Head acute, projecting at 65° angle; tegmen postclaval sutural margin extended from apex of clavus at angle of 155°, meeting apical margin at angle of 65°; vein Cu forked near apex of clavus, branches extending to apical margin; color of tegmen and black marginal spots consistent with pattern in the genus. The plesiotype genitalia are illustrated (Fig. 11). Slight differences in shape of apical processes of the aedeagus were found in specimens from Sabah and Sarawak

Measurements (plesiotype M, lectotype F): Length: overall 9.5, 10.0; v 0.66, 0.71; f 1.66, 1.83; p 0.62, 0.66; m 1.66, 1.99; t 7.64, 8.30; pcl 1.99, 2.49. Width: v 0.71, 0.75; f 1.08, 1.20; t 4.65, 5.15. Hind leg spine formula: 1:6:7, 1:6:6.

Specimens examined: MALAYSIA (EAST), SABAH: Kalabakan, 19 km N, Forest Camp, M, 12.x.1962 (Hirashima) (BPBM); Liawan, plesiotype M, 14-17.i.1959 (Gressitt) (BPBM); Sandakan Bay (SW), Sapagaya Lumber Camp, 2-20m, F, 8.xi.1957 (Gressitt) (BPBM). SARAWAK: Dulit Mt, at foot, Jct of Rivers Tinjar & Lejok, light trap, lectotype F, paralectotype F, 3-28.ix.1932 (Hobby & Moore, BM 1933-254) (BMNH); paralectotype F, same label as lectotype (IRSN); Mulu Mt. Natl Park, nr Long Melinae Site 17, 30 m, low secondary forest, MV on river bank, 2 m, v.1978 (Holloway, RGS Mulu Exped 31344) (BMNH); Ong Tiang Swee Road, at light, F, 18.v.1966 (Rothschild) (BMNH); Simanggang, on citrus, F, 13.ix.1963 (Kuch, BM 1974-1) (BMNH).

2.4. **Salurnis hesita** Medler, sp. nov. (Fig. 12)

Diagnosis: Head shape similar to that of *granulosus*, but slightly obtuse, angled at 100°; mesonotum with 3 strong carinae, and in addition on each side a basal short carina, apparently in transition between 3 and 4-carinae patterns. Tegmen postclaval sutural margin extended from apex of clavus at angle of 155°, meeting apical margin at angle of 70°; veins Cu and M forked at about same plane on tegmen. Color yellow green overall; broad red orange band across pro- and mesonotum (similar band in *granulosus* is fuscous); tegmen with 6 large black spots along postclaval sutural margin.

Characters of the male genitalia are diagnostic (Fig. 12). Female valvulae III spread apart to show pad of dense spines, clasperlike basally against valvulae I.

Measurements (holotype M, allotype F): Length: overall 9.00, 10.25; v 0.50, 0.54; f 1.33, 1.58; p 0.66, 0.66; m 1.99, 2.32; t 7.80, 8.63; pcl 2.32, 2.82. Width: v 0.71, 0.83; f 1.00; 1.16; t 4.65, 6.47. Hind leg spine formula: 1:8:12, 1:8:11.

Holotype: M (Bishop Mus No 15042) LAOS: Sayaboury, Xaignabouri Prov, 13.iv.1966 (J.L. Gressitt) (BPBM). *Allotype:* F, LAOS: same data as holotype (J.L. Gressitt) (BPBM). *Paratypes:* LAOS: F, Ban Van Eue, Vientiane Prov, 800 m, 11. iv.1965 (Gressitt) (BPBM); M, Savannakhet, 15.iv.1967 (Gressitt) (BPBM); F, Sayaboury, Xaignabouri Prov, 13.iv.1966, (Gressitt) (BPBM); F, Tha Ngone, Vientiane Prov, 6.xi.1965, (Gressitt) (BPBM); M, Houay Kinak, Khammouan Prov, 22.iv.1965, (Gressitt) (BPBM); THAILAND: F, Kum Puang Creek, 26.i.1928 (Cockerell) (*Phyllyphanta producta* Spin, det Uvarov) (CAS).

2.5. **Salurnis dilina** Medler, sp. nov.

Diagnosis: Head slightly obtuse, angled at 105°. Tegmen postclaval sutural margin extended from apex of clavus at angle of 170°, meeting apical margin at angle of 77°; veins Cu and M forked on same plane; branches of Cu extending apicad of claval apex. Distinctive pair of orange stripes crossing mesonotum against green background color.

Measurements (holotype F): Length: overall 11.5; v 0.50; f 1.33; p 0.79; m 2.16; t 9.79; pcl 2.82. Width: v 0.91; f 1.16; t 5.81. Hind leg spine formula: 1:8:10.

Holotype: F (Bishop Mus. No 15040), LAOS, Ban Van Heue, 20 km E of Phoukow-kuei, Vientiane Prov., 1-15.v.1965 (L.A. Rondon).

2.6. **Salurnis bipunctata** (Walker) (Fig. 13)

Poeciloptera bipunctata Walker, 1862, p. 312; Medler, 1990, p. 136. Lectotype, M, Siam, London Mus.
Phyllyphanta bipunctata: Metcalf, 1957, p. 184.
Pulastya abbreviata: Distant 1914, p. 421; Metcalf, 1957, p. 201; Medler 1990, p. 164. Lectotype F, Indo-China, London Mus.
Salurnis uniformis Distant 1906, p. 419; Metcalf, 1957, p. 199; Medler, 1990, p. 183. Holotype, F, Burma, Karen Hills, London Mus.

Diagnosis: Head slightly acute, angled at 85°; Tegmen postclaval sutural margin extended from apex of clavus at angle of 165°, meeting apical margin at angle of 85°; vein Cu forked at plane of M fork, both branches extending to apical margin; color uniformly bright green, black marginal spots small. The genitalia of a male from Thailand are illustrated (Fig. 13).

Measurements (M, Khaophappha (BPBM), F, Nakhon (BPBM)): Length: Overall 11.0, 12.0; v 0.62, 0.62; f 1.66, 1.74; p 0.66, 0.75; m 2.16, 2.49; t 8.63, 9.96; pcl 2.82, 2.99. Width: v 0.91, 0.91; f 1.12, 1.25; t 5.15, 5.96. Hind leg spine formula: 1:8:11, 1:8:11.

Specimens examined: BURMA: Karen Hills, Holotype, F (Doherty) (*Salurnis uniformis* det. Distant) (BMNH). CAMBODIA, Kirirom, 700 m, F, M, 31.iii-7.iv.1961 (Spencer) (BPBM); Pnom-Penh, Battambang, F, 1886, No. 1526 (Pavie) (*Flata sinensis* Walk., det. Noulhier 1896, det. Melichar) (MNHN). CHINA, KWANGTUN: Guizhou, Guilin, M, F, 21-25.ix.1980 (Hammond, BM 1980-491) (BMNH); Hop-po, Hoh-o'u Dist, F, 1-7.viii.1932 (Hoffmann, BM 1964-26) (BMNH); Iu-ling-paai, Yeoshan, Lin-hsien Dist, F, 11-12.ix.1934 (To, BM 1964-26) (BMNH); Loh-Chang Dist, 15 F, 9 M, 5-11.ix.1947 (Gressitts) (BPBM); Tai-Ka, Tin-tong, Loh-Chang Dist., F, 8.viii.1947 (Toang & Lam) (BPBM); CHINA, HAINAN ISL: Fan Ta, M, 17.vii.1935 (Gressitt) (NCSU); Fan Ziang, F, 5.iii.1936 (Gressitt) (NCSU); Liamui, 6 M, 30.vii.-3.viii.1935 (Gressitt) (NCSU); Nodoa, 3 M, 31.v.-29.vi.1935 (Gressitt) (NCSU); Nokyu Chun, M, 22.iii.1936 (Gressitt) (NCSU); Ta Hian, M, 17.vi.1935 (Gressitt) (BPBM); Ta Hian, M, F, 12-15.vi.1935 (Gressitt) (NCSU); Ta Hau, 4 M, 3 F, 3-8.vii.1935 (Gressitt) (NCSU). CHINA, SHENSI: Taipaishan, 2 F (BMNH). HONG KONG: Lantau Isl, Shek Pik Reservoir, 9 F, 5 M, 21.vii.1964 (Voss) (BPBM); N. T., Yuen Lang Dist, Castle Pk. For. Sta., F, 29.vii.1964 (Voss) (BPBM); F, (Mus. Westerm.) (COPENHAGEN). INDONESIA: Penang Isl, M, 9321 (Baker) (BPBM). LAOS: Ban Van Eue, Vientiane Prov, 2 F, 13-15.iv.1965 (Gressitt) (BPBM); Ban Van Eue, Vientiane Prov, M, 15.xii.1966 (Rondon) (BPBM); Ban Van Heue, 20 km E. of Phou-kow-kuei, Vientiane Prov, F, 1-15.v.1965 (Rondon) (BPBM); Ban Van Heue, Phou-kow-kuei, Vientiane Prov, 800 m, F, 17.iv.1965 (Gressitt) (BPBM): Gi Sion Village, Tha Ngone, F, 24-31.x.1966 (native collector) (BPBM); Khong Sedone, Wapi, Vapikhamthong Prov, M, 15-30.vii.1967 (native collector) (BPBM); Namkading nr. Pakkading, Borikhan Prov, 100 m, M, 21.v.1965 (Gressitt) (BPBM); Pakkading, Borikhan Prov, F, 9.ix.1965 (native collector) (BPBM); Pakley, F, viii.1917 (de Salvaza) (BMNH); Paksane, Borikhan Prov, F, M, 19.xi-20.xii.1965 (native collector) (BPBM); Phon Tiou, Khammouan Prov, F, 7.vii.1965 (Wilson) (BPBM); Pon-hom, N. of Pakkading, Borikhan Prov, 2 F, 20.iv.1965 (Rondon) (BPBM); Savannakhet, M, 15.iv.1967 (native collector)

(BPBM); Sayaboury, Xaignabouri Prov, 2 M, 13.iv.1966, M, 15.ix.1966 (Rondon) (BPBM); Vientiane, F, 28.vii.1965 (native collector) (BPBM). MALAYSIA (EAST), SARAWAK: Penang Island, M, 9321 (Baker) (BPBM); MALAYSIA (WEST): Connaught Bridge, 9 m, F, 14.iii.1958 (Maa) (BPBM); KEDAH: Changloon, Jalan Sintok, (no abdomen), 2.iv.-2.vii.1938 (Slatter, BM 1938-127) (BMNH). PAHANG: Pukau Tioman, Kampong Tekek, 4 F, 2 M, 18-20.iii.1962 (Kuncheria) (BPBM). PERAK: F, 10.xii.1901 (Grubauer) (*Salurnis granulosus*, det E. Schmidt) (HAMB). SELANGOR: M, 17.ii.1978 (Phoon, C.I.E. No. 10334) (*Phyllyphanta* sp, det M.S.K. Ghauri, 1978) (BMNH). THAILAND: Bangkok, F (Hillman, BM 1928-366) (BMNH); Bankau, F, iii.1913 (van Veen) (RNHL); Biserat, F (BM 1903-127) (BMNH); Chantaboun, Battambang, M, 1986, No. 1842 (Pavie) (*Flata sinensis* Walk, det Noulhier 1898) (MNHN); Chanthabun, F, 25.i.1963 (BM 183-12, C.I.E. No. A3593) (*Pulastya* sp, det M.S.K. Ghauri, 1970) (BMNH); Chaul, F (Mouhot) (BMNH); Chiangdao, Chiangmai Prov, 450 m, M, 5-11.iv.1958 (Maa) (BPBM); Doi Suthep, Chiangmai Prov, 1278 m, M, 29.iii-4.v.1958 (Maa) (BPBM); Kanchanaburi Woods, F, 29.iii.1982 (BM 1983-377) (BMNH); Khaophappha Khoachang, Trang Prov, 200-400 m, M, 1.i.1964 (Samuelson) (BPBM). Khao Sabap, Chantaboom, M, 1936 (MacBeth, BM 1937-24) (BMNH); Nakhon, S. Banna, 108 m, F, 5-10.v.1958 (Maa) (BPBM); Metah Valley & Lampong area, Me Wang Valley, F (Hedley, BM 1954-571) (BMNH); Patami, F, (BM 1903-127) (BMNH); Prew, SE Chanthaburii, 45 m, F, 25-30.iv.1958 (Maa) (BPBM); Sawee, Chumporn, 2F, 9.xi.-11.xii.1981 (Tawornwong & Amporn, BM 1983-37) (*Phyllyphanta* sp, det M.R. Wilson, 1983) (BMNH); Sriracha Dist, Cholburi Prov, F, 22.x.1966 (Burton) (BPBM); THAILAND: (no locality), M, 68.4 (Mouhot) (BMNH); lectotype M, paralectotype F (Pascoe 93-152); paralectotyupe (no abdomen) (Pascoe 93-60) (BMNH). VIETNAM (NORTH): Chapa, Tonkin [Bac-Phan] (de Salvaza) (BMNH); Hoa-Binh, Tonkin, M (Cooman) (MNHN); Luang Prabang, Ban Saloueme (de Salvaza) (BMNH); Nau Tran, Tonkin, M, 1919 (Oberthur) (MNHN). VIETNAM (SOUTH): Anan [Trung Phan], River de Hue, F, 16.iii.1947 (Wright) (*Phyllyphanta producta*) (CAS); Ban Me Thuot, 500 m, M, 20-24.xii.1960 (Yoshimoto) (BPBM); M'Drak, E of Ban Me Thuot, 4-6000 m, F, 3 M, 8-19.xii.1960 (Yoshimoto) (BPBM); Nha Trang, M, 17-26.xi.1960 (Yoshimoto) (BPBM); Nha Trang, 22 km S, 2 F, M, 20-26.xi.1960 (Yoshimoto) (BPBM); Pleiku, 40 km SW, 300 m, F, 11.v.1960 (Quate) (BPBM). VIETNAM (Indo-China): Lectotype F (A. Vuillet), paralectotype F (A.R. Vitalis) (*Pulastya abbreviata*, det Distant) (BMNH).

Taxonomic note: Detailed distribution data are recorded as this is the most widespread and commonly collected species of Phyllyphantini in the Indo-Malayan Subregion. Specimens have not been properly classified by authors subsequent to original description by Walker. All specimens that carried determination labels were misidentified: for example, *Flata sinensis* Walker, *Phyllyphanta producta* Spinola, *Phyllyphanta* sp., *Pulastya abbreviata* Distant, *Pulastya* sp., *Salurnis granulosus* Stål.

2.7. **Salurnis estora** Medler, sp. nov. (Fig. 14)

Diagnosis: Head obtuse, angled at 115°; tegmen postclaval sutural margin extended from apex of clavus at angle of 170°, meeting apical margin at angle of 75°; vein Cu forked apicad of M fork. Appearance similar to *biguttata,* but larger in size. Male genital characters are diagnostic (Fig. 14).

Measurements (holotype M, allotype F): Length: overall, 13.5, 14.5; v 0.50, 0.50; f 1.66, 1.49; p 0.75, 0.83; m 2.82, 2.99; t 11.62, 12.62; pcl 3.49, 4.15. Width: v 1.00, 1.04; f 1.33, 1.41; t 6.97, 7.64. Hind leg spine formula: 1:8:13, 1:8:11.

Holotype: M (Bishop Mus No 15041) LAOS: Received 9.vi.1967 (no other data) (BPBM). *Allotype*: F, LAOS: Ban Van Eue, Vientiane Prov, 800 m, 11.iv.1965 (J.L. Gressitt) (BPBM).

2.8. **Salurnis kryala** Medler, sp. nov. (Fig. 16)

Diagnosis: Morphology as given for genus. Head obtuse, angled at 135°. Tegmen postclaval sutural margin extended from apex of clavus at angle of 155°, meeting apical margin at angle of 65°; Color green or yellow green when faded; heavily marked with dark brown on margins. Genital characters of the male are diagnostic (Fig. 16).

Measurements (holotype M, allotype F): Length; overall 9.0, 9.5; v 0.50, 0.58; f 1.49, 1.49; p 0.66, 0.66; m 1.83, 2.16; t 6.81, 7.80; pcl 1.99, 2.16. Width; v 0.75, 0.75; f 1.12, 1.16; t 4.15, 4.81. Hind leg spine formula: 1:7:8, 1:7:8.

Holotype: (Bishop Museum No. 15043), M, SABAH: Tawau, Quoin Hill, Cocoa Res Sta., 10.ix.1962 (Y. Hirashima) (BPBM). *Allotype:* F, same label as holotype (BPBM). *Paratypes:* INDONESIA, KALIMANTAN: F, Sampit; F, Telang (MHHU). INDONESIA, JAVA: F, Radjamandala, Preanger, 1200 ft [366 m], xii.1935 (le Moult) (RNHL); M, N. Cent. Java, G. Moeria, 2500-3600 ft [762-1097 m], xii.1935 (le Moult) (RNHL). INDIA (SOUTH): F, S. Malabar, Walayar Forests, 1000 ft [305 m], viii.1952 (Nathan) (NCSU). MALAYSIA (EAST), SABAH: F, Kalabakan, 18 km N, Forest Camp, 31.xi.1962, (Hirashima) (BPBM); F, Sanuakan, i.1927, (Pemberton) (BPBM); F, Tanjung Aru Beach, 3-4.viii.1983, (G.F. Hevel & W.E. Steiner) (USNM); 3 M, Tawau, Quoin Hill, light trap, 3-7.viii.1962, (Holtmann) (BPBM); F, 3 M, same label, (Hirashima) (BPBM); F, Tawau, Quoin Hill, Cocoa Res. Sta., 23.vii.1962, cocoa, B1114, (Conway) (BMNH); M, Tawau, Quoin Hill, Cocoa Res. Sta., 22.ii.1962, cocoa, B628 (Conway) (*Salurnis* sp. ? *marginellus*, det M.S.K. Ghauri 1962) (BMNH). MALAYSIA (EAST), SARAWAK: Miri, M, RGS Mulu Exped, 12.vii.1978 (Eastop, BM 1978-411) (BMNH); M, 3 F, Telok Ayer (Muir) (BPBM). SINGAPORE: M, vi.1929 (Van Zualuwenburg) (BMNH).

2.9. **Salurnis marginella** (Guérin-Meneville) (Fig. 15)

Ricania marginella Guérin-Meneville 1829, pl. 58, fig. 6; Medler, 1988a, p. 17. Holotype, (no abdomen), Cochin China, Naples Mus.

Poeciloptera fimbriolata Stål, 1854, p. 247; Metcalf, 1957, p. 196; Medler, 1986c, p. 326. Holotype, F, Malacca, Stockholm Mus.

Salurnis kershawi Kirkaldy 1913, p. 21; Metcalf, 1957, p. 195; Medler, 1987a, p. 122. Holotype, M, Macao, Bishop Mus.

Salurnis formosanus Jacobi 1915, p. 171; Metcalf, 1957, p. 195; Medler, 1986a, p. 108, Fang, 1989, p. 133. Holotype M, Formosa, Dresden Mus. NEW SYNONYMY.

Salurnis marginella: Metcalf, 1957, p. 196; Medler, 1988a, p. 17; Tsaur, 1989, p. 32 (nymphs).

Diagnosis: Head short, obtuse, angled at 125°; mesonotum with 4 carinae. Tegmen postclaval sutural margin extended from apex of clavus at angle of 165°, meeting apical margin at angle of 75°; vein Cu forked at approximately same plane as vein M fork; both branches of Cu extended to apical margin. Color orange green or faded to testaceous; very heavily marked with dark brown or black spots along margins. Genitalia of a male from Loh-Chang are illustrated (Fig. 15).

Measurements (M , F, Loh-Chang (BPBM)): Length; overall 9.0, 10.0; v 0.33, 0.42; f 1.16, 1.33; p 0.50, 0.66; m 1.99, 1.99; t 7.47, 8.13; pcl 2.32, 2.49. Width; v 0.75, 0.79; f 1.04, 1.16; t 4.32, 4.81. Hind leg spine formula: 1:7:9, 1:7:9.

Specimens examined: CHINA, HUNAN: Changteh, Yangshan, M, 3.x.1938 (Maa) (BPBM); Hengyang, M, 20.iv.1939 (Maa) (BPBM). CHINA, FUKIEN: Chungan, Bohea Hills, plesiotype M, F, 18.xii.1940 (Maa) (BPBM); Fuan, Shehkow, F, 15.vi.1943 (Maa) (BPBM); Kienyang, Lungkiba, M, 30.viii.1940 (Maa) (BPBM); Lungchi, F, 7.ix.1940 (Maa) (BPBM). CHINA, KIANGSI: Shangjao, M, 5.vii.1939 (Maa) (BPBM); M [no data]; Kiang-Si, F, 1869, No. 835-69 (David) (MNHN). CHINA, KIANGSU: Shanghai, F, Novara Exped (WIEN). CHINA, KWANGTUNG: Loh-chang Dist, 7 F, 2 M, 7-11.ix.1947 (Gressitt) (BPBM); Sui-kwan, Tin-Long, Loh-chang Dist., F, 17.viii.1947 (Gressitt) (BPBM); Sun-wui, Sen-hwei Dist, F, 10-11.x.1947 (Gressitt) (BPBM); Tin-wu Shan, W of Canton, F, 7-12.vii.1950 (Gressitt) (BPBM). COCHIN CHINA [VIETNAM]: [no locality data], F, (Signoret) (WIEN). INDONESIA, KALIMANTAN: Sampit, F, 9598 (MNHU); Telang, F, x.1881 (Grabowsky) (MNHU). MACAO: holotype M, 2 F (Muir) (*Salurnis kershawi* Kirkaldy) (BPBM). TAIWAN (Formosa): 2 M (Kato) (BPBM). VIETNAM (SOUTH): Pleiku, 50 km SW, 250 m, F, 14.v.1960 (Quate) (BPBM).

2.10. **Salurnis lastendis** Medler, sp. nov. (Fig. 17)

Diagnosis: Closely similar to *S. marginella*, but anterior margin of head more broadly obtuse, angled at 145°; frons as long as wide; pair of red stripes crossing pro- and mesonotum; veins of tegmen orange, contrasting strongly with stramineous or light green membrane; postclaval and apical margins marked with interveinal black dots and dashes; postclaval sutural margin extended from apex of clavus at 165° angle, meeting apical margin at angle of 70 degree. Holotype genitalia with two pairs of strong processes of nearly equal length arising from apex of aedeagus, outer process straight, inner process evenly curved (Fig. 17)

Measurements (holotype M, allotype F): Length: overall 9.5, 10.5; v 0.33, 0.33; f 1.16, 1.25; p 0.66, 0.66; m 2.16, 2.32; t 7.97, 8.96; pcl 2.49, 2.82. Width: v 0.91, 1.00; f 1.16; 1.20; t 4.98, 5.31. Hind leg spine formula: 1:8:11, 1:8:11.

Holotype: M, CHINA: Szechwan, Chang-Tau-Ching, 800-1000 ft. el. (240-300 m), 18.vii.1948 (Gressitt & Djou) (CAS); *Allotype:* F, Paratype: F, same data as holotype (CAS); *Paratype:* F, CHINA: Hupeh-Szechwan border, Sang-Hou-Ken, 19.vii.1948 (Gressitt & Djou) (BPBM).

3. Genus **Unnata** Distant

Unnata Distant 1906; 437; Metcalf, 1957, p. 382. Type-species: *Poeciloptera intracta* Walker, by original designation.
Nakta Distant 1906, p. 436; Metcalf, 1957, p. 380. Type-species: *Nakta stoliczkana* Distant, by original designation.

Diagnosis: Head in dorsal view consisting of frons and vertex merged without discernible margin, extending posteriorly to transverse carina between eyes. Pronotum anterior margin slightly produced, overlapping base of head, slightly notched medially; postocular eminence triangular, carinate anterior arm extended ridgelike to antero-ventral margin of lateral lobe; two longitudinal veins (R+S, M) arising from basal stem of tegmen, costal cell at bulla twice wider than precostal area; vein Cu with 2 branches, forking apicad position of M fork, Cu1 extending to apical margin, Cu2 joining claval suture at apex of clavus, claval veins not forming Y-stem in claval apex. Metatibial spines 1:8.

Distribution: India, Pakistan.

3.1. **Unnata intracta** (Walker) (Figs. 19-22)

Poeciloptera intracta Walker, 1858, p. 116; Medler, 1990, p. 148. Holotype F, India, Punjab, London Mus. Plesiotype M, Punjab, Ludhiana, London Mus, here designated.
Unnata intracta: Distant, 1906, p. 437; Metcalf, 1957, p. 382.
Nakta stoliczkana Distant, 1906, p. 436; Metcalf, 1957, p. 381; Medler, 1990, p. 181. Lectotype M, India, Sind Valley, London Mus.

Diagnosis. Morphological characters same as given for genus. Anterior margin of head obtuse, angled at 160° (Fig. 21); frons widest at plane above antennae, frontoclypeal suture strongly arched, dorsal median carina short (Fig. 20). Postclaval sutural margin extended from apex of clavus at angle of 160°, meeting apical margin at angle of 90° (Fig. 19); anal veins not uniting in Y-stem. Head, thorax and tegmen green, body ochraceous; precostal margin narrowly yellow, gradually tapering from base to thin line in apical and sutural margins; vein Cu yellow orange, this marking originating from patch of yellow basally and ending midlength of tegmen; apical margin with about 20 small dark brown interveinal spots, adjacent costal and postclaval sutural margin also with dark brown spots (Fig. 19). The plesiotype genitalia are illustrated (Fig. 22).

Measurements (plesiotype M): Length: overall; 8.50; v 0.17; f 1.12; p 0.50; m 1.83; t 6.97; pcl 1.99. Width: v 0.75; f 1.08; t 3.98. Hind leg spine formula: 1:8:9.

Specimens examined: INDIA: Bengal, M, (DuVaucel) (*Paranotus ? praetextus*) (MNHN); Punjab, Ludhiana, plesiotype M, i.1968, on grape vine, (Bindra) (C.I.E. A. 2133, *Unnata intracta* Walk, M.S.K. Ghauri det. 1968) (BMNH); Manali, Kulu Valley, 5,800 ft [1770 m], M, 23.vi.1938 (Pruthi) (*Unnata intracta* Walk, det. W.E. China 1941) (BMNH); Punjab, holotype F, (Hearsay) (*Poeciloptera intracta* Walker) (BMNH); [Sind Valley], F.S. 271, Thelam 3062, 10 Valley, lectotype M, paralectotypes, 2 F, York Exp. (Stoliczka) (*Nakta stoliczkana* Distant) (BM 1911-1913) (BMNH).

PAKISTAN, N.W.F: Swat Valley, nr Murghazar, F, 16.x.1977 (Hevel & Ahmad) (USNM); Khyber Pass, Jamrud, 9 mi W, 1100 ft [340 m], 10.x.1977 (Hevel & Ahmad) (USNM).

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

Type-Species: *Umidena bilinea* Medler, here designated.

Diagnosis: Anterior margin of vertex slightly produced, angulate; sutural margin extended, acutely angulate; costal cell at bulla twice wider than precostal area; Cu vein forked, both branches extending to apical margin; anal veins not united in Y-stem at apex of clavus.

Distribution: Thailand, Vietnam.

4.1. **Umidena bilinea** Medler, sp. nov. (Figs. 23-26)

Diagnosis: Anterior margin of vertex carinate, obtuse, angled at 160° (Fig. 25); frons slightly wider than long (Fig. 25); vertex testaceous, pro- and mesonotum bright green, sometimes faded ochraceous or testaceous, overlaid by pair of red longitudinal bands medially and orange red band on each side, these bands continued on mesonotum. Tegmina sutural margins brown testaceous; postclaval sutural margin extended from apex of clavus at angle of 150°, meeting apical margin at 65° angle (Fig. 23); anal veins not uniting in Y-stem. Green color of tegmen contrasting with veins heavily bordered by orange, giving mottled appearance; postclaval marginal cells filled with black or dark brown. Holotype male genitalia are illustrated (Fig. 24).

Measurements: (holotype M, allotype F). Length: overall 7.5, 8.0; v 0.25, 0.25; f 1.00, 1.00; p 0.50, 0.50; m 1.66, 1.66; t 6.31, 6.64; pcl 1.83, 1.83. Width: v 0.83, 0.87; f 1.08, 1.04; t 3.65, 3.65. Hind leg spine formula: 1:7:9, 1:7:9.

Holotype: M, (Bishop Mus. No. 15045), VIETNAM, 15 km NW of Phan Rang, 8-16.xi.1960 (C.M. Yoshimoto) (BPBM). *Allotype:* F, VIETNAM, Ninh Hoa, N. of Nha Trang, 28.xi.1960 (C.M. Yoshimoto) (BPBM). *Paratypes:* INDO-CHINA, M, (A. Vuillet) (BMNH); THAILAND: M, Ban Muak Lek Nat. Park, Saraburi Prov., 6.vi.1965 (P.D. Ashlock) (BPBM); F, Chantaboun, A Battambang, 1886 (A. Pavie) (*Flata acutipennis* Walk, Noualhier det 1896) (MNHN). VIETNAM (SOUTH): F, Annam [Trung Phan], 1912 (R. Oberthur) (MNHN); F, Kim Lien, Quang Nam Prov., 20.viii.1968 (B.W. Miller) (BPBM); V instar nymph, Nha Hue, 15 km N of Phan Rang, 10.xi.1960 (C.M. Yoshimoto) (BPBM). M, Nha Trang, 17-26.xi.1960 (C.M. Yoshimoto) (BPBM); F, Ninh Hoa, same label as allotype (BPBM); Phan Rang, M, F, same label as holotype (BPBM); F, Song Trao, 12 km N Phan Thiet, 300 m, 1960 (C.M. Yoshimoto) (BPBM).

Taxonomic note: The short, flat vertex along with strong red and blue green pattern of marking is unique among genera and species in the tribe. Specimens superficially resemble some *Sephena* that have a similar color pattern.

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

Diagnosis: Allied to *Salurnis,* but differing in more obtusely conical head shape. Costal cell at bulla twice wider than precostal area. Metatibial spines 1:7 or 1:8.

Distribution: Sri Lanka, S. India.

5.1. **Lasura separata** Medler, sp. nov. (Figs. 27-30)

Diagnosis: Vertex projected obtusely at 135° (Fig. 28); frons narrowed dorsally, clypeus inserted convexly in the frons (Fig. 29). Postclaval sutural margin extended from apex of clavus at angle of 150°, meeting apical margin at angle of 75° (Fig. 27). Vein Cu branched slightly apicad of position of M branch, Cu 1 extending to apical margin; anal veins uniting in short Y-stem. Head and thorax uniformly grass green or faded green; ventral part of body uniformly ochraceous; green tegmen marked only with marginal dashes similar to those found throughout the tribe. The characters of the male genitalia illustrated (Fig. 30) are diagnostic.

Measurements: (holotype M, allotype F): Length; Overall 9.0, 10.25; v 0.33, 0.33; f 1.08, 1.20; p 0.58, 0.66; m 1.99, 2.32; t 7.47, 8.63; pcl 2.32, 2.66. Width; v 0.83, 0.91; f 1.08. 1.25; t 4.32, 5.64. Hind leg spine formula: 1:7:9, 1:8:9.

Holotype: M, SRI LANKA: Hunuwilagama, near Wilpattu, Anu Dist, 200 ft (60 m), black light, 28.x-3.xi.1976 (G.F. Hevel, R.E. Dietz, P.B. Karunaratne, D.W. Balasooriya) (USNM). *Allotype:* F, SRI LANKA: Olaithoduvai, 10 mi NW of Mannar, Man Dist, 0-50 ft [0-15 m], 4-5.xi.1976, black light (G.F. Hevel, R.E. Dietz, P.B. Karunaratne, D.W. Balasooriya) (USNM). *Paratypes:* SRI LANKA: F, Chundikkulam Sanct, Jaf. Dist, 25 ft. [8 m], 7.xi.1976, black light (Hevel, et al.) (BPBM); M, Hunuwilagama, Wilpattu, Wildlife Soc. Bungalow, 200 ft [60 m], 10-19.iii.1970 (Davis & Rowe) (BPBM); F, Mannar Island, 1 mi W Pesalai, Man Dist, 24.iii.1970 (Davis & Rowe); F, 9 mi E Puttalam, Put. Dist, 19.vi.1975, black light trap (S.L. Wood & J.L. Petty) (USNM). SOUTH INDIA, F, Coimbatore, Madras State, 1400 ft [425 m], vi.1961 (P. Nathan) (RNHL); 2 F, Coimbature (P. Nathan) (NCSU). SIAM [THAILAND]: F, Chantaboun, Battambang, 1886 (Pavie) (*Flata acutipennis* Walk, Noulhier det. 1896) (MNHN).

6. Genus **Geisha** Kirkaldy

Geisha Kirkaldy, 1900, p. 296; Metcalf, 1957, p. 356; Fang, 1989, p. 138. Type-species: *Poeciloptera distinctissima* Walker, original designation.

Diagnosis: Head not conical, only slightly produced; frons viewed in profile slightly convex along median longitudinal carina; vertex poorly defined, merged with frons anteriorly, bordered posteriorly by transverse carina between eyes; this carina mostly concealed by anterior margin of pronotum. Median longitudinal carina extending full length of pronotum and mesonotum, the latter tricarinate. Lateral lobe of pronotum with postocular carinate ridge extending nearly to ventral margin. Main veins of tegmen strongly outlined, costal cell with network of crossveins, likewise reticulated in clavus and apical half of corium; costal cell at bulla slightly less than twice as wide as precostal area; two longitudinal veins (R+S and M) arising from basal

stem; Cu forked, Cu1 oblique, joining M2 slightly apicad of M fork; Cu2 extending to apex of clavus; A1 + A2 Y-stem present in apex of clavus; precostal margin extended apically, merging with weak submarginal area formed by irregular line of apical cross veins; costal angle convex, sutural angle bluntly rectangular. Detailed figure of tegmen venation published by Melichar (1902), Chou, et al. (1981) and Fang (1989). Metatibial spines 2:7.

Distribution: Indo-China, Japan, Taiwan.

Taxonomic note: Female and male genital characters show that *Geisha* and *Neosalurnis* are closely related. The two genera are easily distinguished externally, however, by differences in shape of the head and tegmina.

Key to species of *Geisha*

Interveinal black dashes along postclaval sutural and apical margins of tegmen.
. . . . . 6.2. **Geisha fangi** Medler, sp. nov.
Tegmen margins without black dashes, margins usually narrowly orange red.
. . . . . 6.1. **Geisha distinctissima** (Walker)

6.1. **Geisha distinctissima** (Walker) (Figs. 31-34)

Poeciloptera distinctissima Walker, 1858, p. 114; Medler, 1990, p. 141. Lectotype, M, North China, London Mus.

Geisha distinctissima: Kirkaldy, 1900, p. 296; Metcalf, 1957, p. 356; Chou, et al., 1981, pp. 85, 92; Fang, 1989, p. 138; Medler, 1990, p. 141.

Geisha sauteri Jacobi, 1915, p. 169; Metcalf, 1957, p. 360; Medler, 1986a, p. 110. Lectotype, M, Formosa, Koshun, Dresden Mus.

Diagnosis: Morphological characters same as given for genus. Anterior margin of head widely obtuse, angled at 140° (Fig. 31); frons longer than wide (Fig. 32). Postclaval sutural margin of tegmen extended from apex of clavus at angle of 175°, meeting apical margin at angle of 100° (Fig.33). Species normally green: - aged museum specimens show wide range of color variation, light green, stramineous, testaceous, ochraceous, or bleached nearly white. Costal, apical and sutural margins of tegmina narrowly red, without dark spots; membrane with obscure mottled appearance due to lighter color of cells in contrast to orange pigmentation along veins. The male genitalia are illustrated (Fig. 34). Female genitalia figured by Fang (1989).

Measurements (M, F, Lungchi (BPBM)): Length: overall 10.50, 12.00; v 0.33, 0.37; f 1.33, 1.49; p 0.50, 0.54; m 2.32, 2.49; t 8.96, 10.29; pcl 2.66, 2.99. Width: v 0.91, 0.95; f 1.16, 1.25; t 5.15, 5.81. Hind leg spine formula: 2:7:8, 2:7:8.

Specimens examined: CHINA BOREAL: [no locality] F, (Stevens) (NRMS); lectotype M, paralectotypes, 5 F (Pascoe) (BMNH). CHINA, FUKIEN: Changhai, Xantus, 12 specimens, det Melichar (HNHM); Chungan City, M, 8.viii.1943 (Maa) (BPBM); Chungan, Bohea Hills, F, 21.vi.1941 (Maa) (BPBM); Chungking, F, 3.viii.1912 (Brown) (BMNH); Foochow, 2 F, 2 M, 27.vii.1934 (Gressitt) (NCSU); Foochow, 3 F, 10-14.vii.1936 (Yang) (BMNH); Hangchow, F, ix.1922 (Sorenson) (NCSU); Liung Chon San, 1 M, 1 F, 20.vii.1936 (Gressitt) (NCSU); Lungchi, 2.ix.1940 (Maa) (BPBM); Shanghai, 2 F, viii.1925 (Sorenson) (NCSU). Shaowu, M, 25.vi.1941 (Maa) (BPBM);

Shaowu, L. Kiatun, M, 12.ix.1941 (Maa) (BPBM); Shaowu, Tachulan, 1000 m, 2 F, 8-12.viii.1945 (Maa) (BPBM); Suisapa, Lichuan Dist., W Hupeh, F, 1000 m, 2.viii.1948; F, 5.viii.1949 (Gressitt) (BPBM); 2 F, 25.viii.1948 (Gressitt & Djou) (CAS). CHINA, HUNAN: Yachiaolin, SE of Ichang, 4 F, vi.1922 (Bowring) (BMNH). CHINA, KIANGAI: Tai Au Hong, 6.vii.1936 (NCSU); Wang Sa Shui, 2 F, 2 M, 8.vii.1936 (NCSU); CHINA, KWANGTUNG: Canton, Honan Isl, F, 17.vi.1933 (Hoffmann) (BMNH).Lohchang Dist, 3 F, 7.ix.1947 (Gressitt) (BPBM); Mei-hsien, 4 F, 4 M, 30.v.1936 (Gressitt) (NCSU); Sui-kwan, San Tinlong, F, 17.viii.1947 (Tsang) (BPBM); Tai-yong, F, M, 5.viii.1936 (Gressitt) (NCSU); Tin-wu Shan, W of Canton, F, 7-12.vii.1950 (Gressitt) (BPBM); Yim Na San, F, M, 15.vi.1936 (Gressitt) (NCSU). HONG KONG: Hong Kong Isl, Pokfulan, 150 m, F, M, 31.v.1964 (Gressitt) (BPBM); Lantau Isl, Shek Pic Reservoir Area, M, 21.vii.1964 (Voss) (BPBM); N.T., Castle Peak, F, 6-13.viii.1964 (L. & H. Ming) (BPBM). JAPAN, HONSHU: Gifu-ken, Gifu, M, 7.ix.1966, MV light (Gressitt) (BPBM); Hakone [Hakone-Yam], 2 F, M, viii.1886 (Leech) (BMNH); Kamakura, 7 F, 4 M, ix.1913 (Muir) (BMNH); Karuizawa [Karuisawa], M, viii.1913 (Muir) (BPBM); Kobe, 2 F, vii, 16.x.1909 (CAS); 2 F, 4 M, 23.vii.1915 (NCSU). Nagahama, 2 M, vii.1886 (Leech) (BMNH); Narita, 6 F, M, 16-17.viii.1979 (Scudder) (BPBM); Nikko, M, vii.1886 (Leech) (BMNH); Otsu, nr. Lake Biwa [Biwa-ko], F, 13.x.1945 (Gressitt) (BPBM); Tokyo, M, vii.1900 (Kuwana) (CAS); F, 4 M, 4.ix.1948 (Gressitt) (NCSU); Yokohama, 22.viii.1904 (Anderson) (BMNH); viii.1906 (Muir) (BMNH); Yokohama, F, det Melichar (IRSN); Yokohama, F (Haglund), det Melichar (NRMS). JAPAN, KYUSHU: Satsuma [Satsuma-Hanto Peninsula], F, v.1886 (Leech) (BMNH). JAPAN, SHIKOKU: Kogoshima Chiran, 200-300 m, M, 12.vii.1963, Kogoshima City [Gojoshima], M, 11.vii.1963 (Yoshimoto) (BPBM). JAPAN: (No locality), M, 3 F (Donitz) (MNHU); F, M, Cat. No. 9831 (Hilgendorf), det. Matsumura, det. Melichar (MNHU). KOREA: Fusan, S. Ichikawa, 2 F, 3 M, 3.viii.1905 (BMNH). MACAO, 2 M, (Muir) (BPBM). RYUKYU, AMAMI-OSHIMA: 3 F, 7 M, 9-10.vii.1932 (Gressitt) (NCSU); Naze City, 16 F, 6 M, 14.vii.1963 (Gressitt); Yuwan Mt, 3 km to Nishinakama, 6 F, 3 M, 19-20.vii.1963 (Yoshimoto) (BPBM); Yuwan-dake Mt, 550 m, 3 F, 2 M, 17.vii.1963 (Yoshimoto) (BPBM); Yuwan-dake Mt., 300-600 m, 2 F, 2 M, 31.vii.1963 (Gressitt) (BPBM). RYUKYU: ISHIGAKI ISL: F, v.1910 (Thompson) (CAS); 5 M, 6 F, 1910 (Thompson) (CAS); 2 F, M, 28.viii, 1934 (Gressitt) (BPBM); Ishigaki-jima, M, 29.vi.1952 (Sato) (BPBM); Banna, 70 m, 7 F, 13 M, 20-23.v.1964, malaise trap (Gressitt) (BPBM); Omoto Vill., 100 m, F, M, 22.v.1964 (Gressitt) (BPBM); Yoncham 5 km, M, 21.v.1964 (Gressitt) (BPBM). RYUKYU, LOOCHOO ISL: Chizuka N, 3 F, 2 M, 2.ix.1945 (Gressitt) (BPBM); F, Chizuka, vii-ix (Bohart & Harnage) (CAS); Iriomote, M, 4 F, 1.vii, 22-24.viii.1932 (Gressitt) (NCSU); Iriomote, M, viii.1934 (Gressitt) (BPBM); Nago, 4 F, 7 M, vi.1958 (Krauss) (BPBM). RYUKYU, OKINOERABU ISL: Oyama, 254 m, F, M, 29.vii.1963, malaise trap (Yoshimoto) (BPBM). RYUKYU, TOKUNOSHIMA ISL, Mikyo, 200 m F, 3 M, 27.vii.1963, #4204, *Clerodendron* (Gressitt), Mikyo, 130 m, F, M, 24.vii.1963 (Yoshimoto) (BPBM). TAIWAN: Bukai, F, 14.vi.1934 (Gressitt) (NCSU); Chirifu, 18.v.1934 (Gressitt) (NCSU); Chikutoge, paralectotypes M, 2 F, vii.1909 (Sauter) (*sauteri* det Jacobi) (DSMT); Hassanzan, M, 24.vi.1934 (Gressitt) (NCSU); Hoozan, paralectotype M, 1910 (Sauter) (*sauteri* det Jacobi) (DSMT); Hori, F, M, 6.vi.1934 (Gressitt) (NCSU); Keelung, 100 m, F, 16.viii.1958 (Lin) (BPBM); Koshun, lectotype M, paralectotype F,

vii.1909 (Sauter) (*sauteri* det Jacobi) (DSMT); Kuraru, 2 F, M, 9.viii.1934 (Gressitt) (NCSU); Nei-Hu, Hsien, Taipei, F, M, 28.viii.1963 (Maa) (BPBM); Ping Tung Lo, Kenting Bot. Garden, 3 F, 5 M, 10-14.vii.1980 (Davis) (USNM); Rokki, F, 4 M, 17.v.1934 (Gressitt) (NCSU); Rokki, 300 m, F, 17.v.1934 (Gressitt) (BPBM); Sakchen, 4 F, 12.vii.1934 (Gressitt) (NCSU); Shirin, M, 24.vii.1927 (Hadden) (BPBM); Taihanroku, paralectotype M, vii.1909 (Sauter) (*sauteri* det Jacobi) (DSMT); Tsaoshan [Sozan], 3 F, 4 M, 9.vii.1958 (Lin) (BPBM); 200-300 m, F, 2 M, 4-5.viii.1963 (Gressitt & Maa) (BPBM); Tsaoshan nr Taipei, 150-300 m, 2 F, 3 M, 9.vii.1958 (Lin) (BPBM); nr. Taipei, 150-300 m, 2 F, 3 M (Lin); Taipei, M, 27-30.vii.1950 (Lin) (BPBM).

Taxonomic notes: Many of the above specimens collected in Japan and Ryukyu by Yoshimoto and Gressitt resulted from the 1963-1964 US-Japan Co-op Sci. Programme.

A female specimen of *G. distinctissima* in the Amsterdam Museum labeled "N. Guinea" (round label) is considered to be a mislabeled specimen. New Guinea is well outside the known distribution area of *distinctissima.*

The provisional determinations of *distinctissima* reported by Fennah (1956) are valid records. California Academy of Sciences specimens recorded by Fennah were examined (F, Chizuka, Okinawa, and 2 F, Suisapa, China).

This species is common in China, Japan and their offshore islands. Data on host plants were summarized by Wilson and O'Brien (1987).

6.2. **Geisha fangi** Medler, sp. nov. (Fig. 35)

Geisha sauteri, Fang, 1989, p. 141, not Jacobi, 1915, p. 169 (Misidentified).

Diagnosis: Morphology closely similar to that given for *distinctissima,* from which it is separated by pattern of markings in margins of tegmina, such as given in the key, and distinctive characters of the male and female genitalia. The holotype genitalia are illustrated (Fig. 35)

Measurements (holotype M, allotype F): Length: overall 12.75, 13.0; v 0.33, 0.37; f 1.41, 1.49; p 0.62, 0.66; m 2.49, 2.49; t 10.29, 10.79; pcl 3.15, 3.49. Width: v 1.16, 1.16; f 1.33, 1.41; t 5.81, 5.81. Hind leg spine formula: 2:7:8, 2:7:8.

Holotype: M, TAIWAN: Bukai, 11.vi.1934 (Gressitt) (NCSU). *Allotype:* F, TAIWAN: Bukai, 14.vi.1935 (Gressitt) (NCSU). *Paratypes:* TAIWAN, F, (Kato) (BMNH); M, (*G. sauteri* det Lallemand) (IRSN); M, Kosempo, 908 (Sauter) (HNHM); Chirifu, M, 18.v.1934 (Gressitt) (NCSU); Hassanzan, F, 26.vi.1934 (Gressitt) (NCSU); Taiheizan, M, 4.vii.1934 (Gressitt) (NCSU); Tsaoshan [Sozan], F, 200-300 m, 4-5.viii.1963 (Gressitt & Maa) (BPBM).

Specimens examined (not syntypes): CHINA, Kuling, F, M, 1.viii.1920, Acc. 23542 (AMNH); Yen-Ping, 5 F, 5 M, iv-viii.1917, Acc. 5148 (AMNH); SE KIANGSI, Hong San, 5 F, 5 M, 22-29.vi.1936 (Gressitt) (NCSU); CHINA, FUKIEN: Shaowui Techulan, 1000 m, F, 1-7.viii.1945 (Maa) (BPBM). PHILIPPINES, MINDANAO: Carriedo Rest House, 20 km SW Davao, 1000 m, F, 1-7.xi.1965 (Davis) (USNM).

Taxonomic note: G. distinctissima and *G. sauteri* were the only species listed in the Metcalf Catalogue (1957). The former was recorded as common and widespread in Japan and China, and the latter was known only from Formosa [Taiwan]. Fang (1989)

recorded *G. distinctissima* and *G. sauteri* in Taiwan. Medler (1986a) showed that *G. sauteri* Jacobi was a junior synonym of *distinctissima.* However, *sauteri* sensu Fang is a valid taxon. The misidentified species is named *Geisha fangi* in recognition of Fang's contribution to a knowledge of the flatids of Taiwan.

The two species of *Geisha* are very closely related but my identifications by use of tegminal markings have been confirmed by study of characters of the male and female genitalia. Fang (1989) also used ratios of width and length of frons to differentiate the species.

7. Genus **Neosalurnis** Distant

Neosalurnis Distant, 1910a, p. 311; Metcalf, 1957, p. 193. Type-species: *Neosalurnis reticulatus* Distant, monobasic. A junior synonym of *Phyllyphanta sinensis* var. *gracilis* Melichar.

Diagnosis: Head obtusely conical, frons and vertex merging dorsally without definable margin, median longitudinal carina of frons extending ventrally from apex of cone about halfway to fronto-clypeal margin; frons elogate oval, lateral margins evenly convex, not flared outward over antennae. Dorsum of head without median carina. Lateral lobe of pronotum with postocular ledge extending from near eye to ventral margin, ridge usually carinate. Tegmina ochraceous green or stramineous, with two longitudinal veins arising from basal stem (R+S, M), costal cell at bulla slightly less than twice width of precostal area, reticulate with crossveins; vein Cu forked, Cu1 oblique, merging with M2 to form short stem (1 mm or less) which then forks so that Cu1 continues freely to apical margin; claval veins united in Y-stem at claval apex; postclaval sutural margin raised at 165-175° from claval apex; meeting apical margin with slightly produced acute angle, costal margin convex; margins marked with black interveinal dashes. Hind leg spine formula 2:7:9-11. Length: 10.5 - 13 mm.

Distribution: Indo-Chinese and Indo-Malayan Subregions.

Taxonomic note: Certain species in *Neosalurnis* and *Salurnis* have a strong superficial resemblance to each other, but such specimens can be distinguished immediately by the 1- or 2-spined condition of the hind leg. Characters of the male and female genitalia indicate a close phylogenetic relationship between certain species in *Neosalurnis* and *Geisha*, but such specimens have very little resemblance in their external appearance.

Key to species of *Neosalurnis*

1. Head acute; angled at 75°. . . . . 7.5. **insignis** Medler, sp. nov.
   Head obtuse; angled at more than 105°. 2
2. From Hainan Island. . . . . 7.2. **insula** Medler, sp. nov.
   Not from Hainan Island. 3
3. Head angled at 115°. . . . . 7.6. **teralis** Medler, sp. nov.
   Head angled at no more than 110°. 4
4. Complex of 4 very similar species distinguished by characters of the male genitalia. 5

5. Aedeagus with paired recurved filaments arising from enlarged apex of median ventral shaft. 6
   Aedeagus with paired recurved filaments arising apically from rodlike ventral projections. 7
6. Ventral median projection of aedeagus fanlike at apex.
   . . . . . 7.5. **insignis** Medler, sp. nov.
   Ventral median projection of aedeagus narrowed at apex.
   . . . . . 7.4. **decalis** Medler, sp. nov.
7. Preapical paired dorsal processes of aedeagus spinelike at apex.
   . . . . . 7.3. **bonenda** Medler, sp. nov.
   Preapical paired dorsal processes of aedeagus enlarged at apex.
   . . . . . 7.1. **gracilis** (Melichar)

7.1. **Neosalurnis gracilis** (Melichar) (Figs. 45-48)

Phyllyphanta sinensis var *gracilis* Melichar, 1902, p. 56. Lectotype, M, Assam, Humboldt Mus.
Lawana ? bicarinata Distant, 1906, p. 421; Medler, 1990, p. 166.
Neosalurnis reticulatus Distant, 1910a, p. 311; Metcalf, 1957, p. 193; Medler, 1990, p. 178. Lectotype, M, Bhutan, London Mus.
Neosalurnis gracilis: Medler, 1986b, p. 48.

Diagnosis: Head obtusely conical, angled at 110° (Fig. 45); lateral margins of frons evenly convex (Fig. 46). Postocular eminence of pronotum weakly developed below eye, without strong carinate ridge extending to antero-ventral margin of pronotal lobe (unusual deficiency in the tribe). Tegmen postclaval sutural margin extended from apex of clavus at angle of 170°, meeting apical margin at angle of 65° (Fig. 47). Genitalia of the lectotype male are reproduced to expedite determination (Fig. 48). Aedeagus consisting of thick shaft with paired preapical rodlike ventral projections from which recurved filaments arise; dorsum of aedeagus with paired pre-apical projections that are apically enlarged balllike.

Measurements (M, Chungah, F, Shaowa (BPBM)): Length: overall 11.00, 12.00; v 0.46, 0.50; f 1.33, 1.49; p 0.58, 0.58; m 2.16, 2.49; t 9.30, 10.62; pcl 3.15, 3.65. Width: v 0.91, 1.00; f 1.04, 1.16; t 5.64, 6.31. Hind leg spine formula: 2:7:9, 2:7:9.

Specimens examined: BURMA: Bhutan, lectotype M; Karen Hills, paralectotype F, (*Neosalurnis reticulatus* Distant) (BMNH). CHINA, CHEKIANG: Yen-Chou [Yanchow], 21.vii.1926 (Wright) (CAS); CHINA, FUKIEN: Fukien, Chungan, Upper Kuatun, 1400 m, M, 21-25.viii.1945 (Maa); Kienyang City, M, 13.x.1941 (Maa); Kienyang, Nwangkeng, F, 15.viii.1945 (Maa); Shaowu Tachulan, 1000 m, 3 F, 2 M, 8-25.viii.1945 (Maa) (BPBM). CHINA, HUNAN: Changteh, Yang-shan, F, 11.x.1938 (Maa); HONG KONG, N.T., Kowloon, 2 F, 29.v.-27.vii.1965, malaise trap (Ming & Ming) (BPBM). Taipokau, F, 21-22.vi.1964 (Voss & Hui); Taipokau, F, 26.vi.1965, hand net (Ming & Ming) (BPBM). INDIA (NORTH), Vasmat, M, viii.1965 (Nathan) (IRSN). VIETNAM (NORTH): Central Tonkin, M, Chiem-Hoa, viii-ix (Frustorfer) (WIEN).

7.2. **Neosalurnis insula** Medler, sp. nov. (Fig. 41)

Diagnosis: Head obtusely conical, angled at 105°; postocular eminence extended strongly ridgelike to margin of paranotal lobe. Tegmen postclaval sutural margin extended from apex of clavus at angle of 170°, meeting apical margin at 70° angle; vein Cu forked, Cu1 oblique, merged with vein M2. Color uniformly green. Genitalia of the holotype illustrated (Fig. 41). Aedeagus consisting of a single thick shaft, pair of rodlike preapical ventral projections bearing slender recurved filaments; dorsal margin of aedeagus without paired pre-apical projection.

Measurements: (holotype M, allotype F). Length: overall 12.0, 13.0; v 0.66, 0.66; f 1.74, 1.83; p 0.58, 0.66; m 2.32, 2.41; t 9.96, 10.62; pcl 3.15, 3.32. Width: v 1.04, 1.16; f 1.20, 1.33; t 5.96, 6.97. Hind leg spine formula: 2:7:9, 2:7:9.

Holotype: M, HAINAN Isl, Dwa Bi, 25.vii.1935 (J.L. Gressitt) (NCSU). *Allotype:* female, HAINAN Isl, Ta Hau, 7.vii.1945 (J.L. Gressitt) (NCSU). *Paratypes:* HAINAN Isl, Kiungchow, F, 27.v.1935 (J. L. Gressitt) (NCSU); Ta Hian, M, 17.vi.1935 (J. L. Gressitt) (BPBM); You Boi, M, (BM 1911-288) (BMNH).

7.3. **Neosalurnis bonenda** Medler, sp. nov. (Fig. 43)

Diagnosis: Head obtusely conical, angled at 105°. Postocular eminence of pronotum strongly ridged, reaching antero-ventral margin of paranotal lobe. Tegmen postclaval sutural margin extended from apex of clavus at angle of 170°, meeting apical margin at 80° angle; vein Cu forked, Cu1 oblique, merged with M2. Color uniformly green. Genitalia of the holotype are illustrated (Fig. 43). Aedeagus consisting of a single thick shaft, with paired recurved filaments arising from preapical rodlike ventral projection; dorsal pre-apical margin with paired spinelike projection.

Measurements (Holotype M, Allotype F): Length: overall 11.0, 11.5; v 0.54, 0.58; f 1.49, 1.58; p 0.58, 0.58; m 2.32, 2.32; t 9.30, 9.79; pcl 2.99, 3.15. Width: v 0.95, 1.00; f 1.16, 1.16; t 5.64, 5.96. Hind leg spine formula: 2:7:9, 2:7:9.

Holotype: M, NORTH VIETNAM: Tonkin, Hoa-Binh, 1928 (Cooman) (MNHN). *Allotype:* F, same label as holotype (MNHN); *Paratype:* M, same label as holotype (BPBM).

7.4. **Neosalurnis decalis** Medler, sp. nov. (Fig. 44)

Diagnosis: Head obtusely conical, angled at 105°; pronotum postocular eminence ridgelike, extended to ventral margin of paranotal lobe. Tegmen postclaval sutural margin extended from apex of clavus at angle of 165°, meeting apical margin at 60° angle; vein Cu forked, Cu1 oblique, merged with M2. Color uniformly green. Holotype genitalia are illustrated (Fig. 44). Aedeagus divided; with paired recurved filaments arising from apex of ventral aedeagal shaft; main aedeagal shaft with paired bladelike processes arising dorso-apically apically and anteriorly.

Measurements (holotype M, allotype F): Length: overall 10.5, 11.0; v 0,58, 0.62; f 1.66, 1.49; p 0.58, 0.54; m 2.16, 2.16; t 8.47, 9.13; pcl 3.07, 3.32. Width: v 1.00, 0.91; f 1.16, 1.16; t 4.65, 5.31. Hind leg spine formula: 2:7:9, 2:7:9.

Holotype: M, (Bishop Mus No. 15038), SOUTH VIETNAM, DaiLanh, N of Nha Trang, 30.xi-5.xii.1960 (C.M. Yoshimoto) (BPBM). *Allotype:* F, same label as holotype (BPBM). *Paratypes:* 6 F, 6 M, same label as holotype (BPBM).

7.5. **Neosalurnis insignis** Medler, sp. nov. (Fig. 42)

Diagnosis: Head acutely conical, angled at 75°. Postocular eminence of pronotum ridgelike, extended ventrally to paranotal margin. Tegmen postclaval margin extended from apex of clavus at angle of 170°, meeting apical margin at 60° angle; vein Cu forked, Cu1 oblique, merging with M2. Color uniformly green. Holotype genitalia are illustrated (Fig. 42). Median ventrally directed shaft of aedeagus enlarged apically, fanlike, dorso-apical margin giving rise to slender curved process reaching almost to pygofer.

Measurements (holotype M): Length: overall 11.0, v 0.66; f 1.66; p 0.54; m 2.16; t 9.30; pcl 3.32. Width: v 1.00; f 1.16; t 5.48. Hind leg spine formula: 2:7:9.

Holotype: M (Bishop Mus No. 15037), VIETNAM, Ap Hung-Lam, 21 km NW of Dilinh, 1100 m, 29.ix-5.x.1960 (C. M. Yoshimoto) (BPBM). *Paratype:* male, VIETNAM, Fyan, 900-1000 m, 11.vii-9.viii.1961 (N. R. Spencer) (BPBM).

7.6. **Neosalurnis teralis** Medler, sp. nov. (Fig. 49)

Diagnosis: The largest species in the genus, length 12-13 mm. Head obtusely conical, angled at 115°; postocular eminence of pronotum ridgelike, extended to ventral margin of paranotal lobe. Tegmen postclaval sutural margin extended from apex of clavus at angle of 175°, meeting apical margin at 70° angle; vein Cu1 oblique, merged with vein M2, together forming stem. Holotype genitalia are illustrated (Fig. 49). Characters of the aedeagus differing from usual pattern in the genus; in particular, large thumblike process arising dorsally from between pygofers at base of aedeagus; slender recurved dorsal filaments absent.

Measurements (holotype M, allotype F): Length: overall 12.5, 13.0; v 0.50, 0.66; f 1.49, 1.74; p 0.54, 0.66; m 2.32, 2.32; t 10.13, 10,13; pcl 3.82. 3.98. Width: v 1.04, 1.08; f 1.20, 1.20; t 5.96, 6.31. Hind leg spine formula: 2:7:11, 2:7:9.

Holotype: M (Bishop Mus No. 15039), LAOS: Ban Van Eue, Vientiane Prov., 14-15.iv.1965 (J. L. Gressitt) (BPBM). *Allotype:* F, LAOS: Sayaboury, Sayaboury Prov., 12.xii.1965, light trap (Rondon) (BPBM). *Paratype:* THAILAND: F, Prew, Chanthaburi Prov., 45 m, 24.iv.- 1.v.1958 (T. C. Maa) (BPBM).

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

Type species: *Amasha decepta* Medler, here designated.

Diagnosis: Vertex shallowly convex-angulate; with dorsal median carina; anterior margin thick; frons oval, dorsal margin U-shaped, lateral margins evenly convex, not flared over antennae, median carina present. Postocular eminence of pronotum not strongly developed as elongated ridge. Costal cell of tegmen same width as precostal margin, margins lacking black dots, in this respect atypical for the

tribe. Distinct line of apical crossveins delimiting narrow submarginal area, terminal veins in dense array. Vein Cu forked, Cu1 oblique, merged with vein M2; claval veins united in Y-stem at apex of clavus. Metatibial spines 2:6 or 2:7

Distribution: Indo-Malayan.

Key to Species of *Amasha*

1 Anterior margin of vertex truncate; sutural angle acute. . . . . 8.3. **abrupta** Medler, sp. nov.
Anterior margin of vertex produced medially, slightly angulate. 2
2. Strong submarginal line of crossveins; in female, valvulae III with thick marginal teeth close together. . . . . 8.1. **decepta** Medler, sp. nov.
Weak and irregular line of submarginal crossveins; in female, valvulae III with slender teeth well spaced. . . . . 8.2. **inepta** Medler, sp. nov.

8.1. **Amasha decepta** Medler, sp. nov. (Figs. 50-53)

Diagnosis: Morphology as given for genus. Anterior margin of vertex convex, angled at 135° (Fig. 53); frons oval, dorsal margin thickened, U-shaped carina indicated weakly (Fig. 51). Tegmen postclaval sutural margin extended from apex of clavus at angle of 175°, meeting apical margin at angle of 95° (Fig. 50); margins normally red or red orange, black spots absent, or if present, then restricted to postclaval sutural margin; well developed submarginal line of crossveins, submarginal area narrow, 0.5 mm wide. Holotype genitalia illustrated (Fig. 53). Allotype valvulae III with single row of 6 strong teeth closely inserted along ventral margin.

Measurements (holotype M, allotype F): Length: overall 12.0, 11.5; v 0.50, 0.37; f 1.49, 1.33; p 0.66, 0.50; m 2.49, 2.16; t 10,46, 9,13; pcl 3.65, 2.49. Width: v 1.04, 1.00; f 1.37, 1.33; t 4.98, 4.81. Hind leg spine formula: 2:7:8; 2:6:8.

Holotype: M (Bishop Mus. No. 15035), THAILAND: Doi Suthep, N.W. Chiangmai Prov., 1278 m., 29.iii.-4.v.1958 (T.C. Maa) (BPBM). *Allotype:* F, WEST MALAYSIA: Pahang, Cameron Highlands, 4500-4800 ft. [1370-1470 m], 23.vi.1935 (H.M. Pendlebury, BM 1955-354) (BMNH). *Paratypes:* BURMA: M, nr Rangoon, lower Irawata [Irrawaddy R], 1913 (H. Schrader, No. 193,1930) (HAMB). INDONESIA: F, Sumatra, Gun. Teleman, v.1917 (E. Jacobson) (ITZA). THAILAND: M, Doi Suthep, Chiangmai Prov., 1-5.iv.1958 (T.C. Maa) (BPBM). 2 M, MALAYSIA (WEST): Selangor, Bukit Kutu, 3400 ft [1035 m], viii.1915; M, Selangor, Bukit Kutu, 3500 ft [1050 m], 14.iii.1931 (H.M. Pendlebury, BM 1955-354); M, Perak, Larut Hills, at light, 4500 ft [1375 m], 24.ii.1932 (H.M. Pendlebury, BM 1955-354) (BMNH).

8.2. **Amasha inepta** Medler, sp. nov.

Diagnosis: Anterior margin of vertex thick, obscure horseshoe-carina separating frons and vertex. Tegmen apex tattered, but remaining fragments indicate that apical margin is no more than slightly angulate; postclaval sutural margin only slightly

raised from apex of claval apex. Tegmen heavily reticulated by numerous short crossveins, R+S stem short, margins red, without black dots or dashes. Holotype valvulae III with row of 6 slender separated teeth along ventral margin.

Measurements (holotype F): Length: overall 13.0; v 0.33; f 1.41; p 0.58; m 2.32; t 10.13; pcl 3.32. Width: v 1.16; f 1.49; t 5.96. Hind leg spine formula: 2:6:8.

Holotype: F (Bishop Mus No. 15036), VIETNAM, Mt. Lang, Bian, 1500-2000 m, 19.v-8.vi.1961 (N.R. Spencer) (BPBM).

8.3. **Amasha abrupta** Medler, sp. nov. (Figs. 54-55)

Diagnosis: Differs from congeners in short length of truncate vertex (Fig. 54); frons truncate dorsally, margin formed by broad U-shaped carina which medially terminates longitudinal frontal carina (Fig. 55). Postclaval sutural margin extended at angle of 165° from claval apex, meeting apical margin at angle of 65°; numerous closely spaced terminal veins in submarginal area; submarginal area 0.5 mm wide. Tegmen ochraceous, color obscured by dusting of white waxy powder, veins dull green, margins narrowly red, without black spots or lines. Holotype valvulae III with row of heavy spines on ventral margin, same as seen in *decepta.*

Measurements (holotype F): Length; overall, 11.00; v 0.17; f 1.25; p 0.54; m 2.16; t 9.63; pcl 3.82. Width; v 1.00; f 1.33; t 5.31. Hind leg spine formula: 2:6:8.

Holotype: F, Philippines, Mindanao, Carriedo Rest House, 20 km SW of Davao, 1000 m, 1-7.xi.1965 (Davis) (USNM).

9. **Saurana** Medler, gen. nov.

Diagnosis: Related to *Amasha*, but differing in broadly conical shape of vertex; which is separated from narrow U-shaped frons by a relatively thin margin; dorsal surface of vertex finely striate, this sculpturing confined within median triangular area bordered basally by smooth triangular platelike areas; median longitudinal carina shallow. Tegmen with R+S stem, costal cell at bulla same width as precostal marginal area; heavy reticulation of short cross veins on disc, Cu forked, both branches reaching post claval sutural margin, which is elevated, meeting apical margin at acute angle; claval veins united in Y-stem at apex of clavus; submarginal line of crossveins forming narrow submarginal area; terminal veins numerous along apical margin. Metatibial spines 2:6.

9.1. **Saurana aberrans** Medler, sp. nov. (Figs. 56-59)

Diagnosis: Morphology same as given for genus. Vertex broadly conical, blunt apically, angled at about 115° (Fig. 57); frons elongate, narrowly conical at dorsal margin (Fig. 58). Tegmen postclaval sutural margin extended from apex of clavus at angle of 170°, meeting apical margin at angle of 90° (Fig. 56); veins orange, numerous crossveins on disc, margins apically with small black interveinal spots. The holotype genitalia are illustrated (Fig. 59).

Measurements (holotype M): Length; overall, 11.25; v 0.75; f 1.66; p 0.66; m 2.16; t 9.13; pcl 2.99. Width; v 1.00; f 1.33; t 4.65. Hind leg spine formula: 2:6:8.

Holotype: M (Bishop Mus No. 15044) VIETNAM, Bian, Mt. Lang, 1500-2000 m, 19.v-8.vi.1961 (N.R. Spencer) (BPBM).

10. Genus **Pulastya** Distant

Pulastya Distant 1906, p. 417; Metcalf, 1957, p. 201. Type-species: *Phyllyphanta acutipennis* Kirby, original designation.

Diagnosis: Head conical, produced at angle of 90 - 95°. Frons with sharp lateral carinae, widest where flared over antennal bases. Costal cell slightly more than twice wider than precostal area. This is the only genus in the tribe with R and S+M veins arising from basal stem. Metatibial spines 2:6

Distribution: Sri Lanka.

Taxonomic note: Changes in the status of species assigned to *Pulastya* in the Metcalf Catalogue (1957) have been made as follows:

Pulastya abbreviata Distant, 1914, p. 421. See *Salurnis bipunctata* (Walker). (Medler, 1990).

Pulastya cornutipennis Kirkaldy, 1902, p. 53. See *Pulastya dubia* (Kirby).

Pulastya cornutipennis Walker, sensu Melichar, 1902, p. 55 (Error). See *Pulastya dubia* (Kirby).

Pulastya discolorata Distant, 1918, p. 200. See *Lawana imitata* (Melichar). (Medler, 1990).

Pulastya dubia Kirby, 1891, p. 157. Restored as valid species. NEW STATUS.

Pulastya fimbriata Walker, sensu Melichar, 1902, p. 55 (Error). See *Pulastya dubia* (Kirby).

Key to species of *Pulastya*

Anterior margins of head and pronotum bluntly rounded; median carina of pronotum not sharply ridgelike. . . . . 10.1. **acutipennis** (Kirby)

Anterior margins of head and pronotum rather pointed; median carina of pronotum sharply ridge like. . . . . 10.2. **dubia** (Kirby)

10.1. **Pulastya acutipennis** (Kirby) (Figs. 37-40)

Phyllyphanta acutipennis Kirby, 1891, p. 156. Lectotype, M, Ceylon, Pundaloya, London Mus, here designated.

Pulastya acutipennis: Distant, 1906, p. 417; Metcalf, 1957, p. 201.

Flata cornutipennis Kirkaldy, 1902, p. 53. Nom. nov. for *Phylliphanta* [sic] *acutipennis* Kirby, 1891, not *Cromna acutipennis* Walker, 1857.

Phyllyphanta cornutipennis: Melichar, 1902, p. 55.

Diagnosis: Head conical, produced at 90° (Fig. 38); frons elongate, widened above antennal bases (Fig. 39). Tegmen postclaval sutural margin extended from apex of clavus at angle of 165°, meeting apical margin at angle of 65° (Fig. 40). Color bluish

green, dorsum with distinctive red brown stripe extending across vertex, pro- and mesonotum, sutural margins narrowly brown or black. Lectotype genitalia are illustrated (Fig. 37).

Measurements (lectotype M, paralectotype F): Length: overall 12.5, 14.0; v 0.50, 0.33; f 1.49, 1.33; p 0.91, 0.83; m 2.49, 2.49; t 10.62, 10.62; pcl 3.32, 3.32. Width: v 0.87, 0.79; f 1.25, 1.20; t 6.64, 6.81. Hind leg spine formula: 2:6:8, 2:6:6.

Specimens examined: SRI LANKA [Ceylon]: Colombo, Col. Dist, 0-50 ft. [0-15 m], F, 1.x.1976 (Hevel & Dietz) (USNM); Enselwatte, Mata Dist, F, 25.v.1975 (Wood & Petty) (USNM); Inginiyagala, Amp Dist, F, 7-8.ix.1975 (Davis, et al.) (USNM); Kanneliya, Galle Dist, 200 ft. [60 m], F, 15-17.x.1976 (Hevel, et al.) (USNM); Kanneliya Forest, Galle Dist, F, 16.v.1974 (Gans & Prasanna) (USNM); Pundaloya, 30, lectotype M, paralectotypes 3 F, M (Green, 90-115) (BMNH); Pundaloya, F (Atkinson, 92.6) (BMNH); Teldeniya, Kan Dist, 1400 ft. [425 m], M, 18-20.xi.1976 (Hevel, et al.) (BPBM); Uygalkaltota, Rat Dist, F, 23-26.vi.1978 (Krombein, et al.) (USNM). [No locality data], 3 F (Nietner, Cat No. 5108, 5114), *Phyllyphanta acutipennis,* det Melichar (MNHU). F, (Heuser 91); [no abdomen], (Nietner, Cat 5108); F, [no data]; each with labels *acutipennis,* det Melichar, *cornutipennis* det Karny (WIEN).

Taxonomic notes: The specimens from Pundaloya in the London Museum are considered valid syntypes as each have label data in agreement with the original description. In addition each specimen has a small rectangular blue-gray label with the number 30, and accession label BMNH 90-115.

Pulastya acutipennis may be the senior synonym of *Colobesthes taprobana* Kirkaldy, 1908. The approximate size and markings asscribed to *taprobana* could also apply to *acutipennis* except that a "greenish-yellow stripe down the vertex to the apex of the closed clavus" is not typical for *acutipennis*, which has a reddish brown stripe. This enigma cannot be solved positively without examination of the Kirkaldy type whose location is unknown at present.

10.2. **Pulastya dubia** (Kirby), status nov. (Fig. 36)

Phyllyphanta dubia Kirby, 1891, p. 157. Holotype, F, Ceylon [Sri Lanka], Putlam, London Mus. Plesiotype, M, Sri Lanka, Inginiyagala, United States National Mus, here designated.

Phyllyphanta acutipennis: Metcalf, 1957, p. 201 (Error).

Diagnosis: Head conical, produced at angle of 95°; tegmen postclaval sutural margin extended at angle of 160°, meeting apical margin at angle of 65°. This species is closely related to *acutipennis*, but can be separated by attention to headshape and characters of the male genitalia. The plesiotype genitalia are illustrated (Fig. 36).

Measurements (plesiotype M and F, same label (USNM)): Length: overall 11.75, 12.25; v 0.42, 0.50; f 1.49, 1.54; p 1.16, 1.16; m 2.32, 2.41; t 9.63, 10.29; pcl 3.15, 3.32. Width: v 0.75, 0.75; f 1.08, 1.12; t 6.31, 6.31. Hind leg spine formula: 2:6:6, 2:6:6.

Specimens examined: SRI LANKA [Ceylon]: Alutnuwara, M, 17.xii.08 (Fletcher) (Distant coll. 1911-383) (BMNH); Hasalaka Circuit Bungalow, F, 30-31.v.1975 (Messersmith, et al.) (USNM); Inginiyagala, Amp Dist, 250 ft. [80 m], plesiotype M, F, 21-24.xi.1976 (Hevel, et al) (USNM); Palatupana, Ham Dist, F, 3.ii.1975 (Krombein et

al.) (USNM); Putlam, 35, holotype F (Green 90-115) (BMNH); Sigiriya, 800 ft. [250 m], M, 13-14.xi.1976 (Hevel, et al.) (USNM); Yala National Park, Ham Dist, sea level, F, 3.viii.1973 (Ekis) (USNM).

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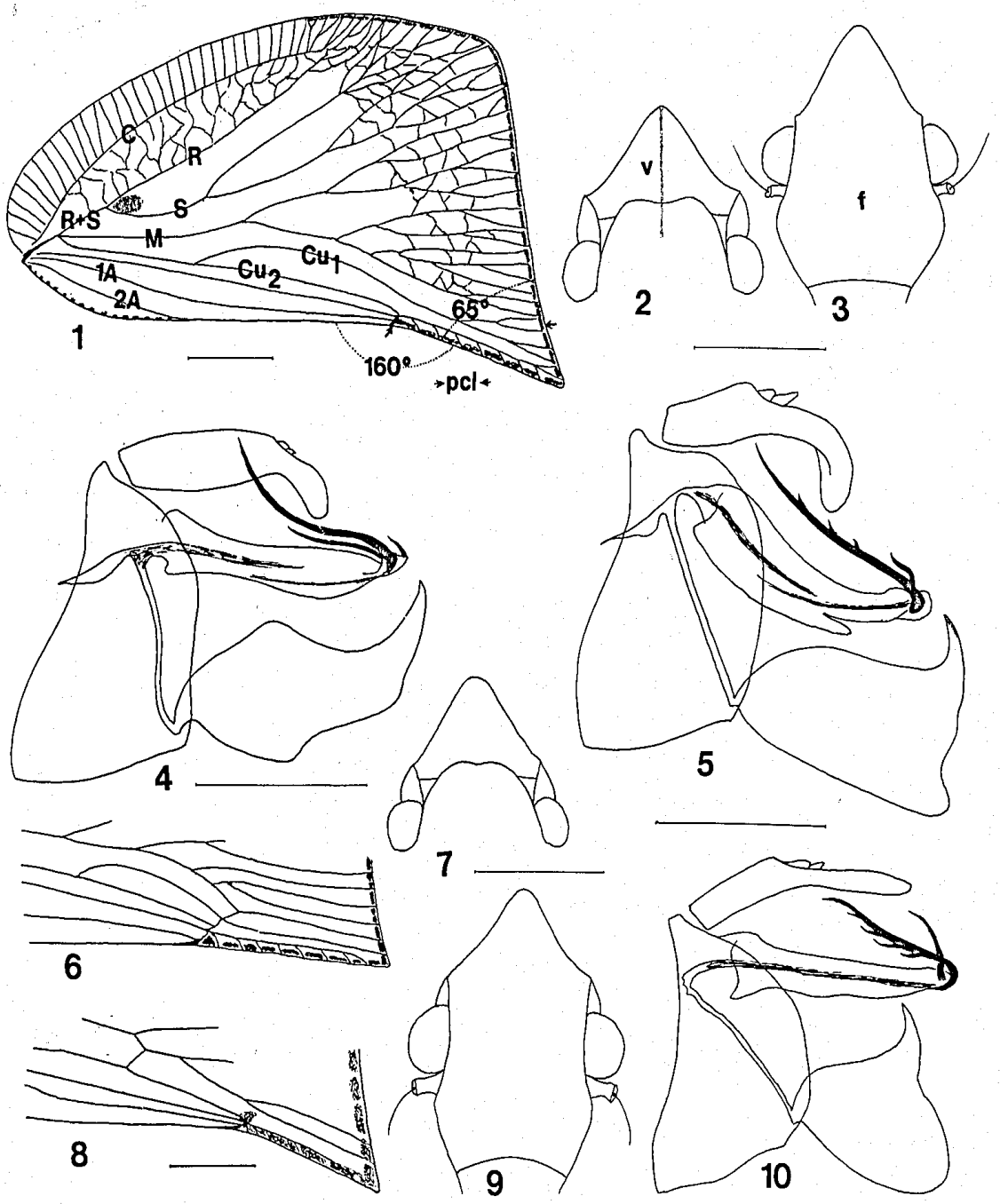

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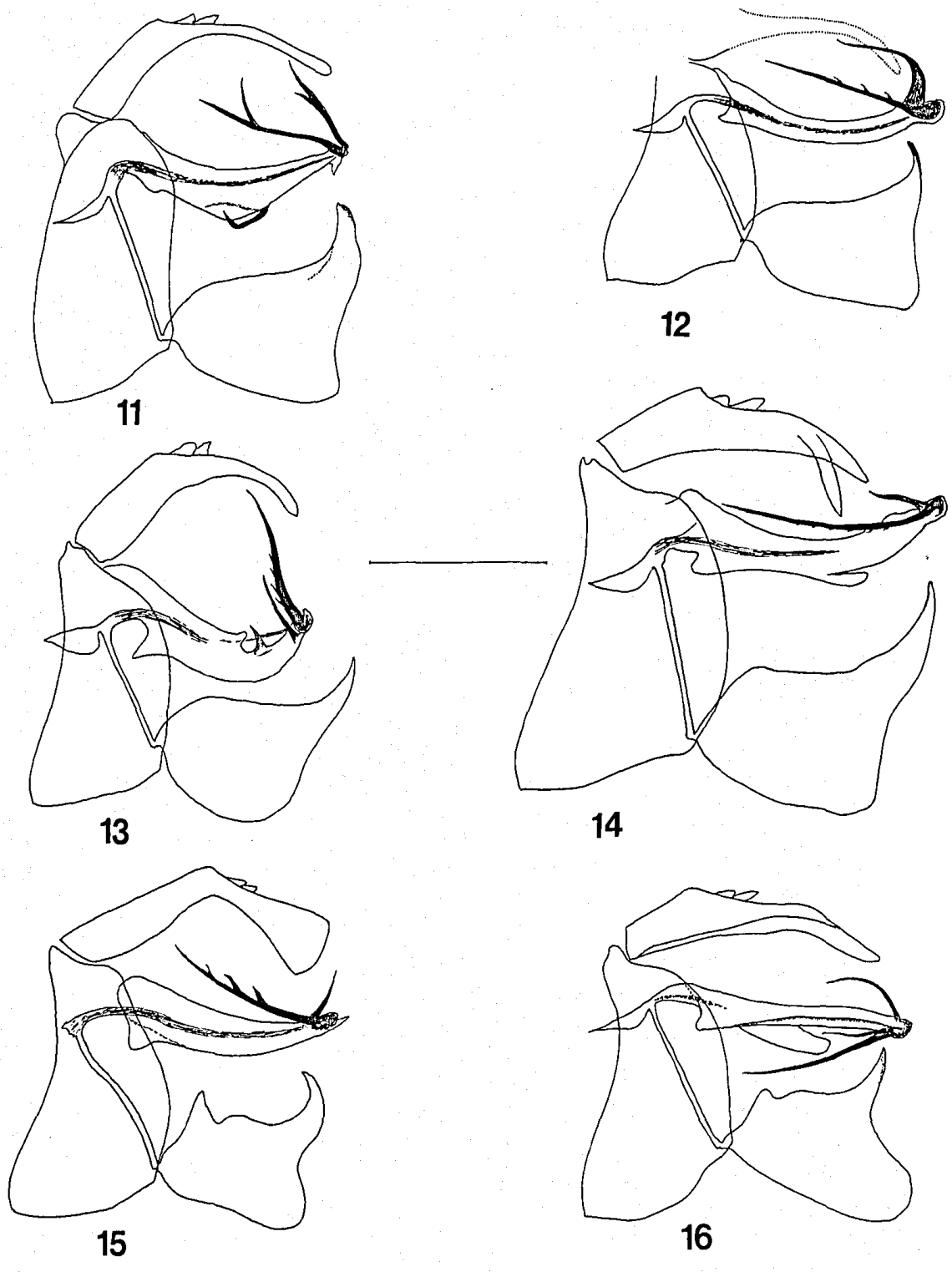

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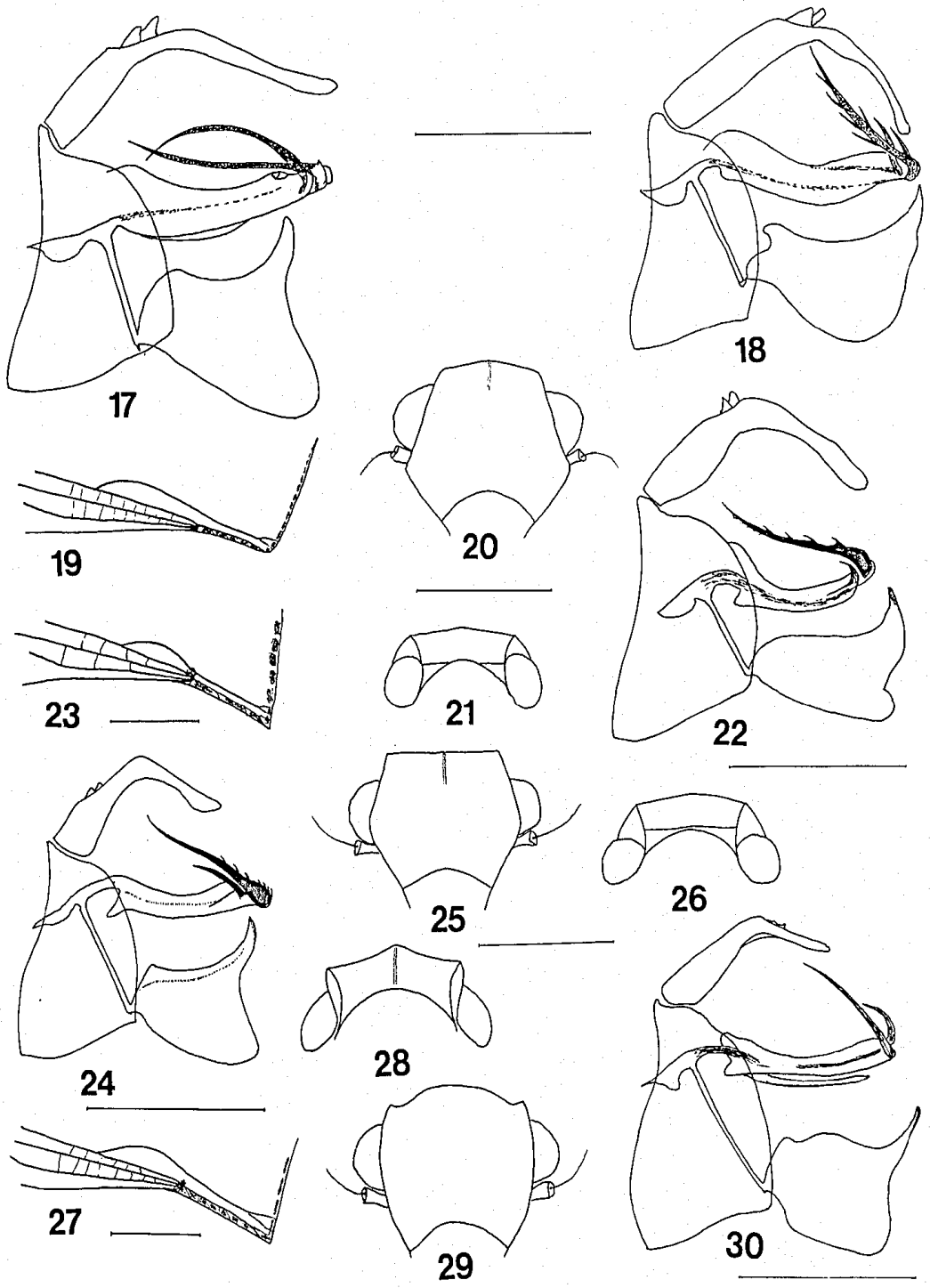

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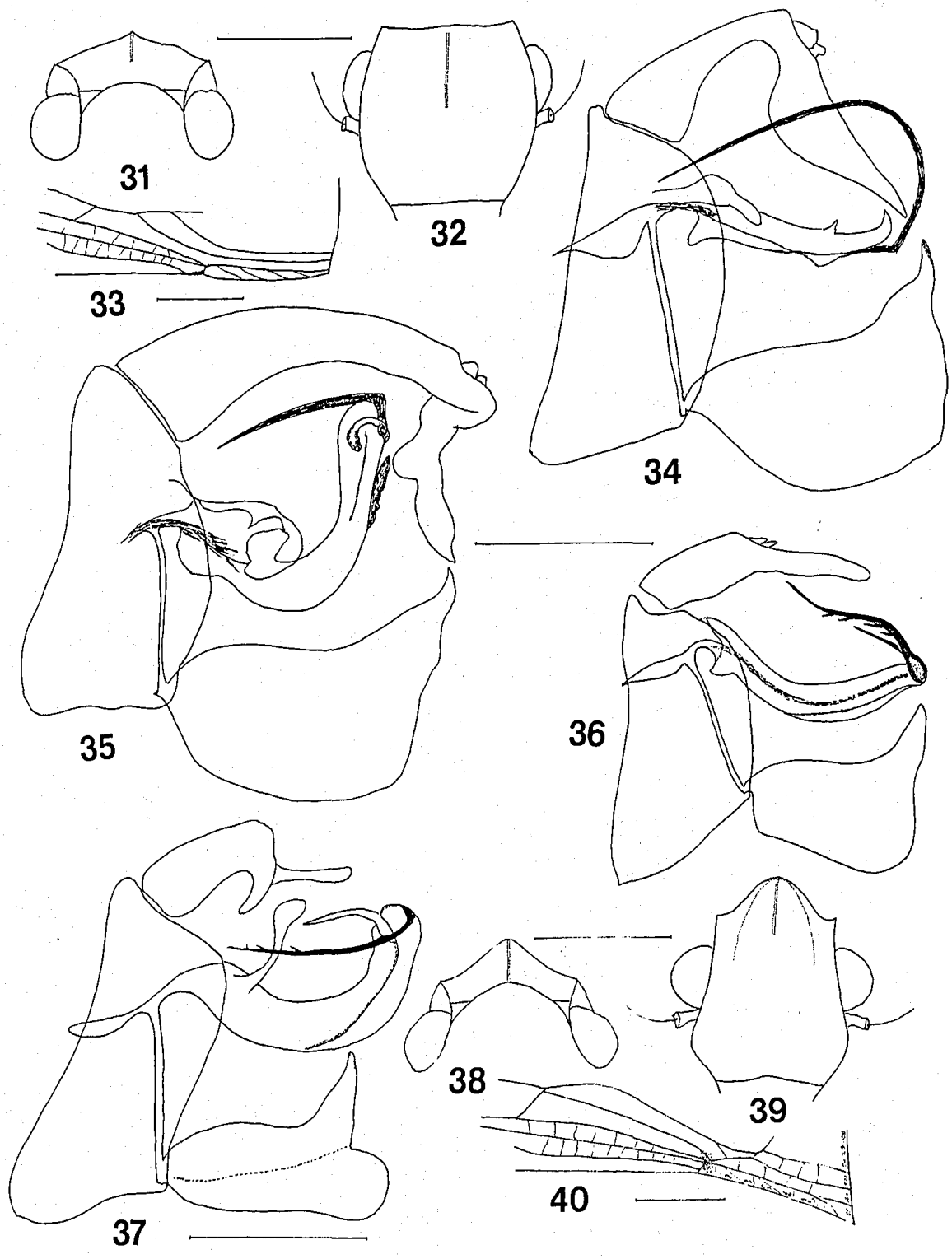

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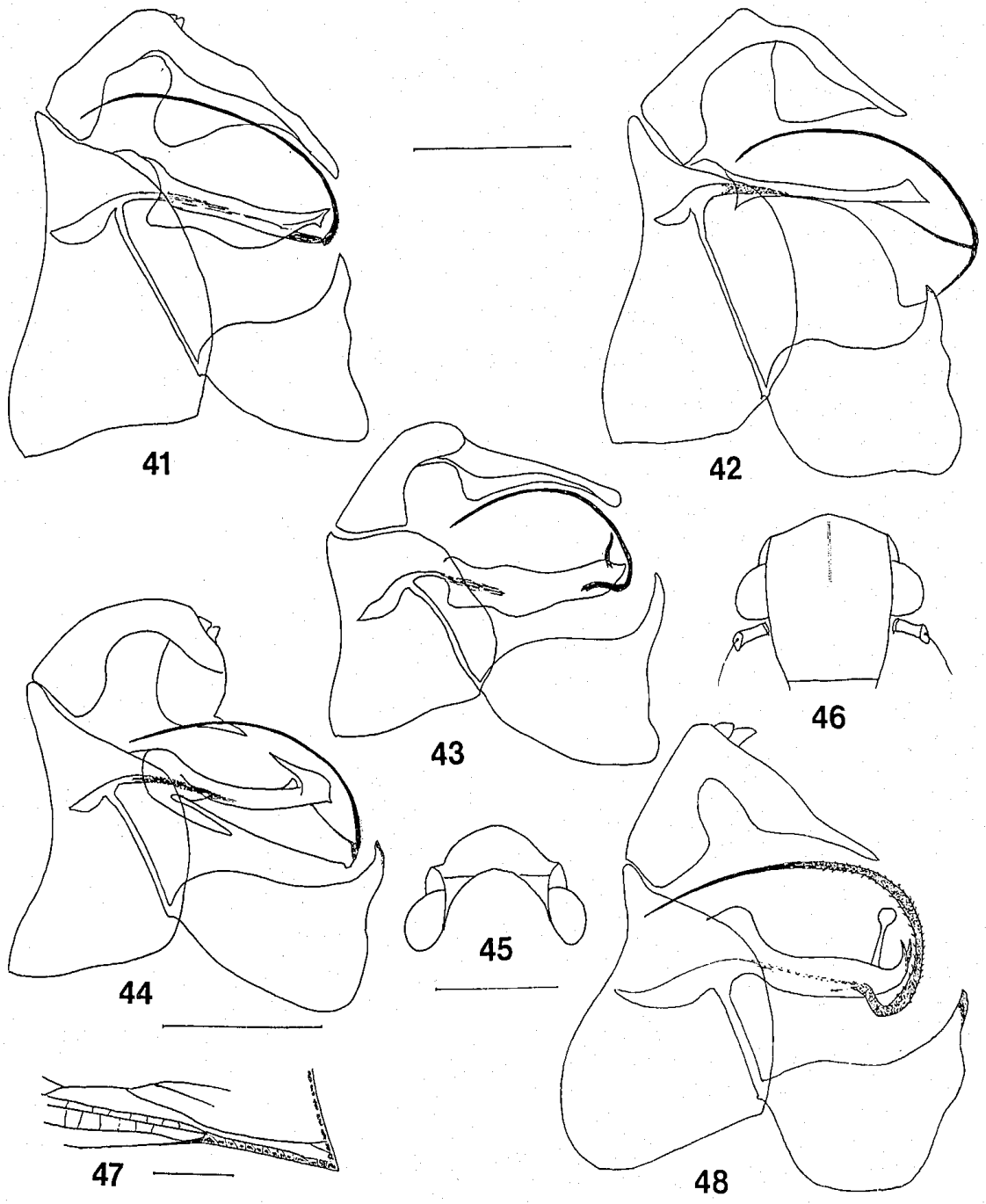

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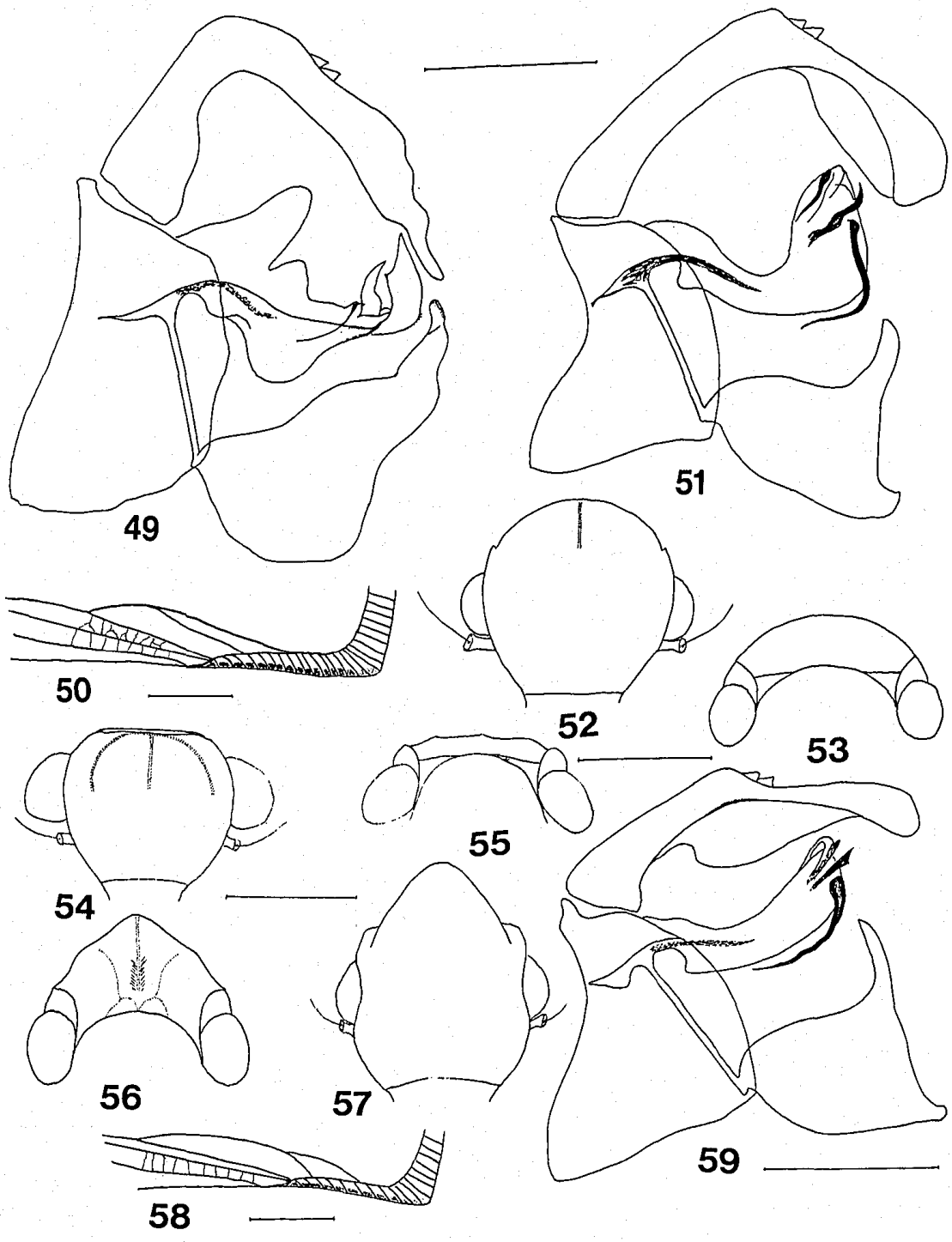

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TAXONOMIC STUDIES ON *TANYTARSUS* V. D. WULP (DIPTERA: CHIRONOMIDAE) IN INDIA

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ABSTRACT. The imagines of nine new species of *Tanytarsus* v.d. Wulp, namely, *Tanytarsus atroxitarsus, cristatus, cultellus, gracilistylus, infundibulus, parvistylus, pollexus, quinspinosus* and *rectistylus* are described. *T. balteatus* Freeman, *dycei* Glover, *glabrescens* Edwards, *nichollsi* Glover, *okuboi* Sasa & Kikuchi and *ponapensis* Tokunaga are newly recorded from India. A key to identify all the known Indian species is provided.

Introduction

Tanytarsus v. d. Wulp (1858) is one of the most well defined chironomine genera occurring in oligotrophic to mesotrophic lakes. Some species are also eurytophic living in stagnant water or may be quite resistant to low oxygen level but also in streams and fast flowing water (Langton, 1984). A few species are known to be marine and at least *Tanytarsus barbitarsus* Freeman has been identified as the most halotolerant and also a pest of small scale organisms (Kokkin, 1986)

Kieffer (1910, 1911a,b, 1912 and 1913) reported 32 species of *Tanytarsus* from the Oriental Region, of which 13 were from India. In his catalogue of Oriental Chironomidae, Sublette & Sublette (1973) placed all but one of Kieffer's species as "Unplaced Species of Tanytarsini" or as "Nomina Dubia". This was evidently because of the inadequate descriptions and figures provided by the original author and also due to the non-availability of types. *Tanytarsus confundenda* Kieffer was placed under *Micropsectra* Kieffer.

Prior to our research, the adults of 14 species were described from India by Singh & Kulshrestha (1975), Chaudhuri et al. (1984, 1988) and Guha et al. (1985). The juveniles of only one species, *Tanytarsus aculeus* were described from India by Chaudhuri et al. (1988). In the present paper, we treat 15 species, of which 9 are described as new from India.

The terminology and morphological descriptions follow the style of Saether (1980). The measurements are in millimeters (mm.) The number before parentheses indicates the mean value while the values within parenthesis denote minimum and maximum values and 'n' denotes the number of specimens examined.

The types and voucher specimens are in the Entomology Unit of the Department of Zoology, University of Burdwan and will be subsequently deposited in the National Zoological Collections, Calcutta, India; The Natural History Museum, London, England; U. S. National Museum, Washington D.C., U.S.A.; and in the Zoologisches Staatssammlung, Munchen, Germany.

Abbreviations: IV - inner verticals; OV - outer verticals; PO - postorbitals; L/W - palpal ratios AR - antennal ratio; ER - eye ratio; CA - head-antennal ratio; CP - heal-palpal ratio; C,Sc,R-R4+5 - veins of wing; r-r4+5 - cells of wing; RM - radio-medial