

## REVISION OF THE COCKROACH GENUS

### *HOMOPTEROIDEA* SHELFORD

#### (BLATTARIA, POLYPHAGIDAE)

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Eight species of *Homopteroidea* occur in Malaysia, Mentawai I., Philippines, Sabah, Sarawak, Sulawesi, and Sumatra. Five species are redescribed, one is transferred from *Ctenoneura*, another is resurrected from synonymy, and two new taxa are described. Diagnostic characters are given for the genus and a key is presented to distinguish the adults.

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Key words. – *Homopteroidea*; Blattaria, Polyphagidae; cockroaches; taxonomy; redescriptions, new species.

Princis (1963: 104) listed four species of *Homopteroidea* from Malaysia and Indonesia. In the present paper eight taxa are considered to be valid: one species is transferred from *Ctenoneura*, another is resurrected from synonymy, five are redescribed, and two new taxa are described.

The following museums and their curators or collection managers kindly loaned me specimens: HECO – Hope Entomological Collections, University of Oxford, England; Dr. George C. McGavin & Mr. I. Lansbury; MZZB – Museum Zoologi Bogoriense, Bogor, Indonesia; MCZC – Museum of Comparative Zoology, Harvard University, Cambridge, MA, U.S.A.; RMNH – National Museum of Natural History (Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands; Mr. J. van Tol; ZILS – Zoological Institute, Lund, Sweden; Dr. Roy Danielsson.

#### SYSTEMATIC PART

##### Genus *Homopteroidea* Shelford

*Homopteroidea* Shelford, 1906: 274. – Type species: *Homopteroidea nigra* Shelford, by monotypy.

*Fulmekia* Karny, 1926: 152. – Type species: *Homopteroidea nodipennis* (Karny) = *Fulmekia nodipennis* Karny, by monotypy.

Diagnosis. – Eyes reduced, wide apart, lateral, located behind the antennal sockets (fig. 19). Tegmina and wings usually fully developed extending beyond end of abdomen, or tegmina reduced and hind wings vestigial (one species, fig. 53); venation and pigmen-

tation of right and left tegmina usually differ in fully developed winged forms, the major veins thickened or raised, the region of the presutural vein (Hanitsch's terminology) branches of the right tegmen colourless hyaline (fig. 3, right, a; except in *aberrans*). Hind wing without an intercalary vein between the radius and media, cubitus vein with two (fig. 34) or three (fig. 11), branches whose distal regions usually are connected by cross veins (fig. 4; except in *aberrans*). Front femur Type C<sub>1</sub>, the piliform spinules are practically contiguous and appear as a dense fringe (fig. 22); pulvilli absent, tarsal claws symmetrical, distinctly toothed on their proximal halves, arolia usually absent (fig. 5), or if present small and 'fleshy' whitish (fig. 6). Male: Abdomen unspecialized; the supraanal plate usually with a large white or yellowish medial nonsetose macula (fig. 13; absent in male *aberrans* and all females; I do not consider this a tergal gland). I have examined a pair of *Homopteroidea nodipennis* that were collected joined end to end *in copula* with the distal half of the male's supraanal plate bent anteriorly and the female's terminalia were inserted and held by the male's phallomeres in his genital chamber. Apparently the unsclerotized membranous zone on the male's supraanal plate is more flexible than the heavily sclerotized areas and allows the plate to be bent so that the female's genital segments can be inserted and grasped properly; some pinned specimens have the distal half of the supraanal plate bent upwards even though they are not in copula. Subgenital plate symmetrical with a pair of similar widely spaced styli (fig. 14); the anterior margin of the plate often is straight and usually lacks lateral apodemes (fig. 30).



Female subgenital plate incised longitudinally (fig. 50).

### Distribution checklist by species of *Homopteroidea*

(Records for specimens from localities which I have not seen are taken from the literature and are shown in brackets.)

<i>aberrans</i> Hanitsch: Mentawai; Sabah; Sumatra ..	115
<i>biramiata</i> sp. n.: Sumatra .....	112
<i>brachyptera</i> sp. n.: Sumatra .....	114
<i>maculata</i> Hanitsch: Mentawai; Philippines; Sabah. [Java; Sumatra] .....	112
<i>minor</i> Hanitsch: Sabah; Sumatra .....	114
<i>nigra</i> Shelford: [Java]; Malaysia; Mentawai; Sabah; Sarawak; Sulawesi; [Sumatra] .....	109
<i>nodipennis</i> Karny: Malay Peninsula; Sabah; Sarawak; Sumatra .....	106
<i>shelfordi</i> Hanitsch: Sabah; Sarawak. [Borneo; Malacca; Sumatra] .....	104

### Geographical distribution checklist of *Homopteroidea* species

(Specimens from localities I have not seen are taken from the literature and are shown in brackets.)

Borneo: *shelfordi*. – Java: [*maculata*; *nigra*]. – Malacca: [*shelfordi*]. – Malaysia: *nigra*. – Malay Peninsula: *nodipennis*. – Mentawai I.: *aberrans*; *maculata*; *nigra*. – Philippine I.: *maculata*. – Sabah: *aberrans*; *maculata*; *minor*; *nigra*; *nodipennis*; *shelfordi*. – Sarawak: *nigra*; *nodipennis*; *shelfordi*. – Sulawesi: *nigra*. – Sumatra: *aberrans*; *biramiata*; *brachyptera*; *minor*; *nodipennis*; [*maculata*; *nigra*; *shelfordi*]

### Key to species of *Homopteroidea*

1. Tegmina and wings fully developed extending beyond end of abdomen ..... 2
- Tegmina reduced, not reaching end of abdomen, hind wings vestigial (fig. 53) ..... *brachyptera*
2. Left and right tegmina similar in colour and sclerotization. Hind wing branches of the cubitus vein not connected by cross veins (fig. 1E in Roth 1993) ..... *aberrans*
- Right tegmen with a clear hyaline presutural zone which is coloured in the left one (fig. 3). Hind wing branches of the cubitus vein connected by cross veins (fig. 4) ..... 3
3. Tegmina with a pale hyaline macula on their proximal halves (fig. 28) ..... *maculata*
- Tegmina without pale maculae ..... 4

4. Hind wing with two cubitus branches (fig. 34) ..... 5
- Hind wing with three cubitus branches (fig. 4) ..... 6
5. Hyaline presutural zone with four or five oblique branches (fig. 43). Arolia absent ..... *minor*
- Hyaline presutural zone with more than five branches (fig. 34). Arolia present (fig. 33) ..... *biramiata*
6. Pronotum dark reddish brown with the lateral border regions lighter (fig. 20). Antennae brownish or black with as many as 15 white terminal antennomeres. Male genitalia as in fig. 25 ..... *nigra*
- Pronotum with the distal lateral border regions whitish or pale (figs. 1, 7). Antennae without white terminal segments ..... 7
7. Arolia absent (fig. 5). Male genitalia as in fig. 2 ..... *shelfordi*
- Arolia present (fig. 6). Male genitalia as in fig. 8 ..... *nodipennis*

### REDESCRIPTIONS, AND DESCRIPTIONS OF NEW SPECIES

#### *Homopteroidea shelfordi* Hanitsch (figs. 1-5)

*Homopteroidea shelfordi* Hanitsch 1925: 99, fig. 12 (♂ & ♀) (in part, 2♂ from Mt. Murud only); 1929: 266, fig. 6; 1932a: 52; 1932b: 6; 1933a: 328; 1933b: 235; Bruijning 1948: 146; Princis 1963: 104.

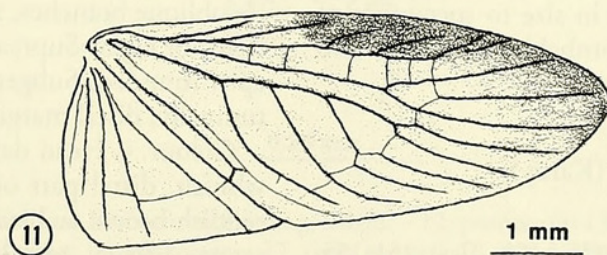
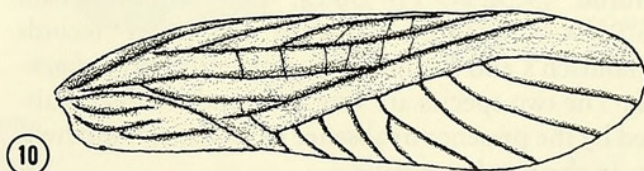
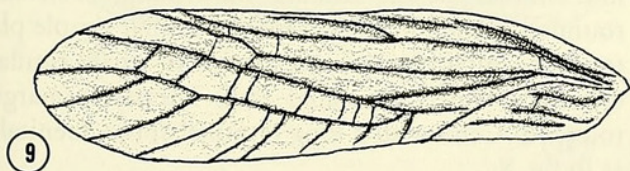
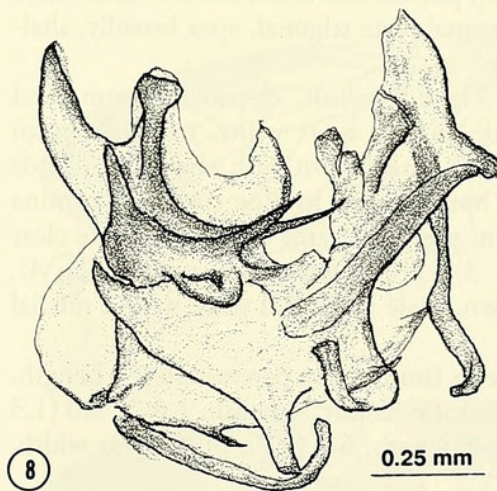
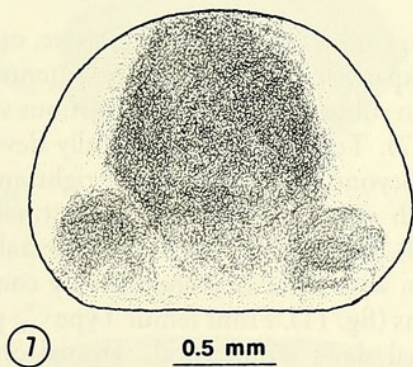
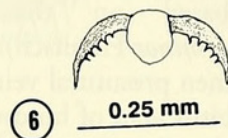
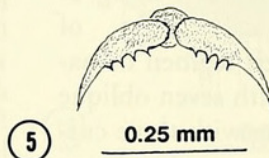
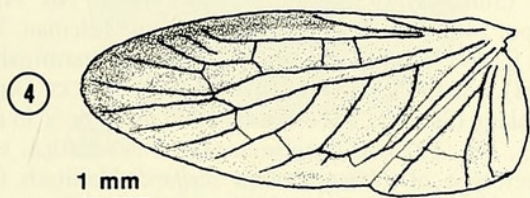
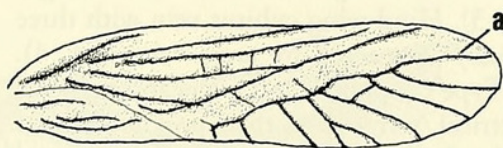
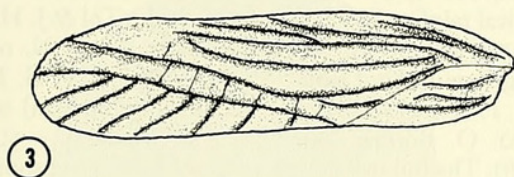
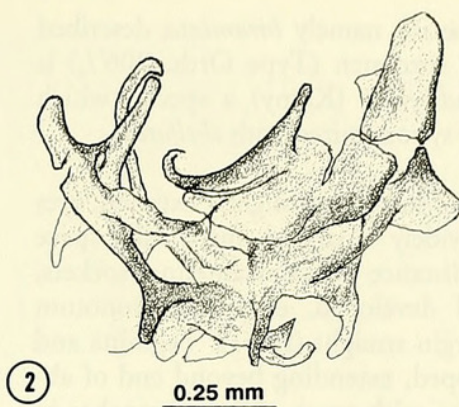
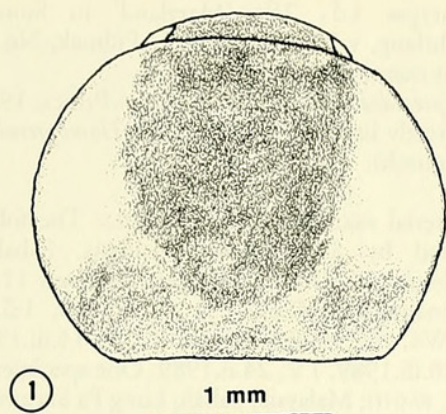
*Fulmekia nodipennis* (nec Karny). Princis, 1963: 105.

Type material. – Lectotype ♂ (terminalia slide 276) (here designated; Princis labelled this specimen lectotype, 1963 but apparently never published the designation), Mt. Murud, Sarawak, 6500 ft., Dr. E. Mjöberg, Sarawak Museum dd 1925; Type Orth. 206<sup>1</sup>/<sub>4</sub> in HECO. Paralectotypes. Sarawak. HECO: same data as lectotype 1♂ (fragmented), Type Orth. 206<sup>2</sup>/<sub>4</sub>. Additional material. – SABAH. HECO: ♀ paralectotype of *Homopteroidea minor* Hanitsch, Type Orth. 389<sup>2</sup>/<sub>2</sub>, B.N. Borneo, Mt. Kinabalu, Kenokok, 3300 ft., 22.iv.1929.

Two other paralectotypes in HECO with the following data are not *shelfordi*: one with the same data as the lectotype, Type Orth. 206<sup>3</sup>/<sub>4</sub>, has on the back of the type label '*Homopteroidea hanitschi* sp. n., K. Princis, 1963', but the description was never published.

Figs. 1-11. *Homopteroidea* spp. – 1-4. *H. shelfordi* Hanitsch, male lectotype: 1, pronotum; 2, genitalia (dorsal); 3, left and right tegmina (a = presutural vein in right tegmen); 4, left hind wing; 5, tarsal claws. – 6-11. *H. nodipennis* (Karny) males: 6, tarsal claws; 7, pronotum; 8, genitalia (dorsal); 9, left tegmen; 10, right tegmen; 11, right wing. (6, 9-11, from Singgalang, Sumatra; 7, 8, from Sipitang, Sabah).







hed. It is a new species, namely *biramiata*, described below. The other specimen (Type Orth. 206<sup>4/4</sup>) is *Homopteroidea nodipennis* (Karny) a species which Princis incorrectly synonymized with *shelfordi*.

Redescription. – Male: Head slightly exposed, eyes reduced, lateral, widely separated, interocular space greater than the distance between antennal sockets, ocellar spots well developed, elliptical. Pronotum suboval, hind margin straight (fig. 1). Tegmina and wings fully developed, extending beyond end of abdomen, left tegmen with seven oblique branches in the presutural zone, the right one with seven or eight branches (fig. 3). Hind wing cubitus vein with three branches distally connected by cross veins (fig. 4). Front femur Type C<sub>1</sub>, pulvilli and arolia absent, tarsal claws symmetrical, serrated on their proximal halves (fig. 5). Abdominal terga unspecialized, supraanal plate hind margin convexly rounded, right and left paraprocts similar simple plates. Genitalia as in fig. 2.

Female (based on the paralectotype of *Homopteroidea minor* Hanitsch): Left tegmen damaged, right tegmen presutural vein with seven oblique branches. Cubitus vein of hind wing with three curved branches distally connected by cross veins. Front femur Type C<sub>1</sub>, pulvilli and arolia absent, tarsal claws serrated. Supraanal plate trigonal, apex broadly, shallowly concave.

Colour. – Head blackish, clypeus, labrum, and mandibles pale, ocellar spots white, maxillary palpi black. Pronotum dark brown with about two thirds of the lateral borders pale, hyaline (fig. 1). Tegmina reddish brown, presutural area of the right one clear hyaline (fig. 3). Hind wing infuscated (fig. 4). Adomen brown, male supraanal plate with a medial pale macula.

Measurements (mm) (♀ in parentheses). – Length, 4.7 (4.0); pronotum length × width, 1.6 × 2.0 (1.3 × 1.7); tegmen length, 6.4 (4.7); interocular width, 0.9 (0.7).

Comments. – So far *shelfordi* is found only on Mt. Murud [3°52'N 115°30'E], and Mt. Kinabalu [6°05'N 116°33'E]. Most of the other records (Hanitsch's and Bruijning's) apparently are *nodipennis*. The two species are very close and are distinguished by the presence or absence of arolia, and differences in their male genitalia.

The female specimen from Mt. Kinabalu is smaller than the male and is similar in size to specimens of *Homopteroidea minor* which probably led Hanitsch to designate it a syntype of that species.

***Homopteroidea nodipennis* (Karny)**  
(figs. 6-11)

*Fulmekia nodipennis* Karny, 1926: 158, figs. 151-155.

Syntypes 1♂, 2♀, 'Maryland' in Sumatra, O.K., Lichtfang, v.1925, leg. Dr. L. Fulmek, No. 2; in MZZB [not examined].

*Homopteroidea nodipennis* (Karny). – Princis 1963: 105 (incorrectly listed as a synonym of *Homopteroidea shelfordi* Hanitsch).

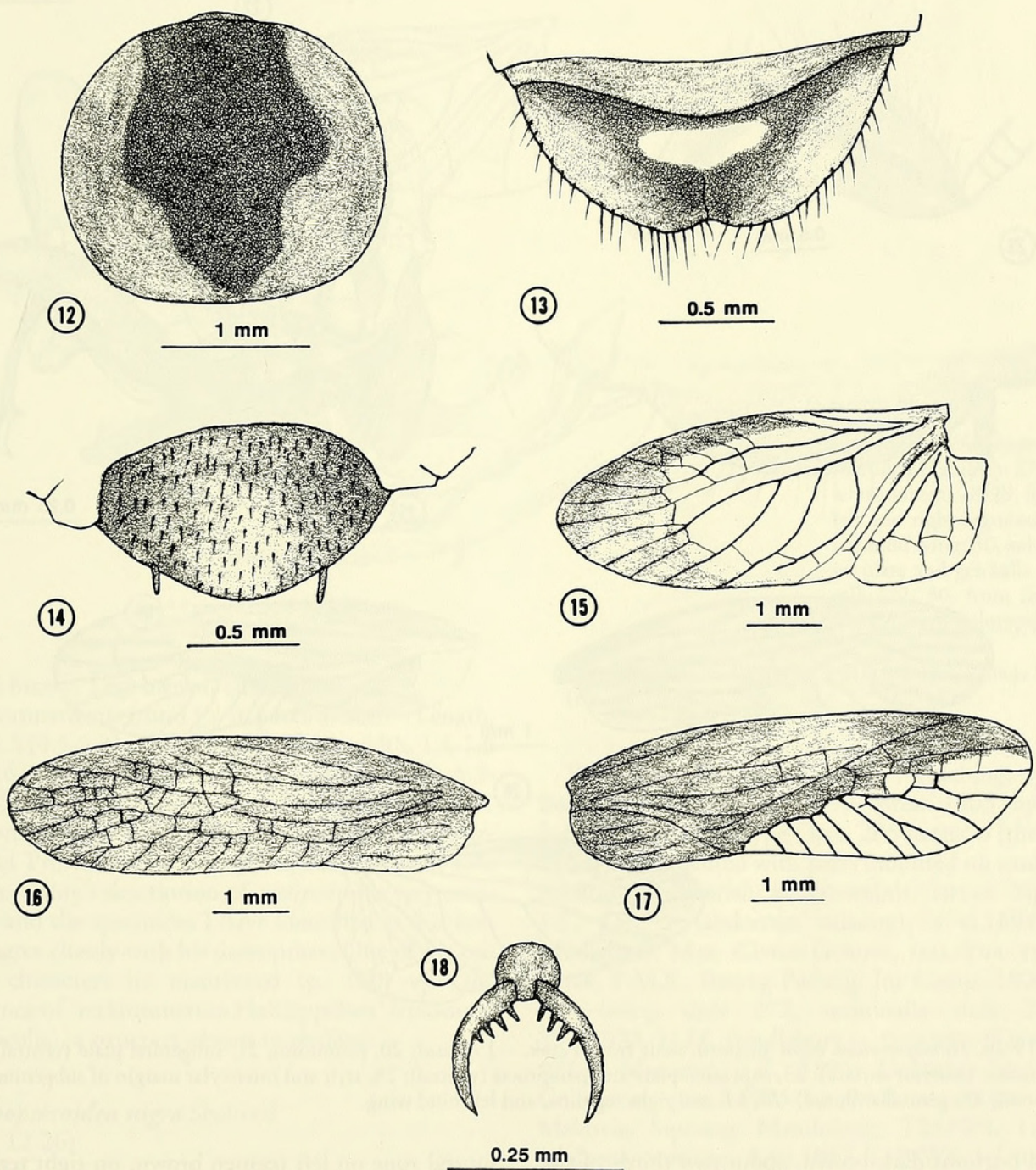
Material examined. – SABAH. ZILS: The following were collected by S. Adebratt: Malaysia, Sabah, Sipitang, Mendolong, T5/R, 1 (abdomen missing), 11.v.1988; 1♂ (terminalia slide 426), 1♀, 28.iv.1988, 1♂, 2.iii.1989, T1B/W4, 1♀, 10.iii.1988, T6/R, 1♀, 14.iii.1989, T3/W5, 1♂, 20.iii.1989, 1♀, 24.ii.1989. One specimen retained in MCZC. RMNH: Malaysia, Sabah, Long Pa Sia airstrip along S. Pa Sia, 115°43'E 4°25'N, 1090 m, 1♀, 14.x.1986, J. Huisman; Beaufort, 105 km S. of Long Pa Sia area, Sg. Ritan, 115°42'E 4°24'N, 1160 m, undisturbed evergreen tropical rainforest, 1♂, 7.iv.1987, J. van Tol & J. Huisman. – SARAWAK. RMNH: Borneo, Sarawak, 16km N. of Bario, Long Rapun, Sg. Dapur, ML, 115°35'E 3°53'N, 1200 m, 1♂, 19-20.ii.1987, J. Huisman. – [Indonesian] BORNEO. HECO: O. Borneo, Pajau R., 1♀, Mjöberg. – SUMATRA. RMNH: The following were collected by E. Jacobson: Fort de Kock (Sumatra), 920 m, 2♂, 2♀, 1925; Air Njuruk Dempu, 1400 m, 1♂, 4♀, viii.1916; Gun. Teleman, Sum., 1♂, 1♀, 1917; Sungai Kumbang, Sum., 1♂ (terminalia slide 208), viii.1915. Two retained in MCZC. HECO: Gunung Singgalang (Sumatra's Westkust), 1800 m, ♂ & ♀ in copula, 5♂, 1♀, 1925, E. Jacobson. MALAY PENINSULA. HECO: paralectotype of *Homopteroidea shelfordi* Hanitsch (Type Orth. 206<sup>4/4</sup>), Perak, Larut Hills, 4000-5000 ft., capt. ii.iii.1905, & pres. by R. Shelford.

Redescription. – Male: Head globose, exposed, eyes wide apart, lateral, behind the antennal sockets. Pronotum subparabolic the dark portions slightly raised (fig. 7). Tegmina and wings fully developed extending beyond end of abdomen; right and left tegmina with six to eight oblique presutural branches (fig. 9-10). Hind wing with three subcostal veins, cubitus vein with three branches distally connected by cross veins (fig. 11). Front femur Type C<sub>1</sub>; pulvilli absent, tarsal claws symmetrical, serrated on proximal halves, very small arolia present (fig. 6). Abdominal terga unspecialized; supraanal plate with a large hyaline whitish median macula, hind margin convexly rounded, right and left paraprocts similar simple plates. Subgenital plate symmetrical with small, similar, cylindrical widely separated styli, interstyler margin rounded. Cerci with a long terminal spine. Genitalia as in fig. 8.

Female: Left tegmen presutural zone with four to six oblique branches, right one with seven (one branched) or eight. Supraanal plate hind margin trigonal, apex rounded. Subgenital plate divided mediolongitudinally, distal margin in lateral view truncate.

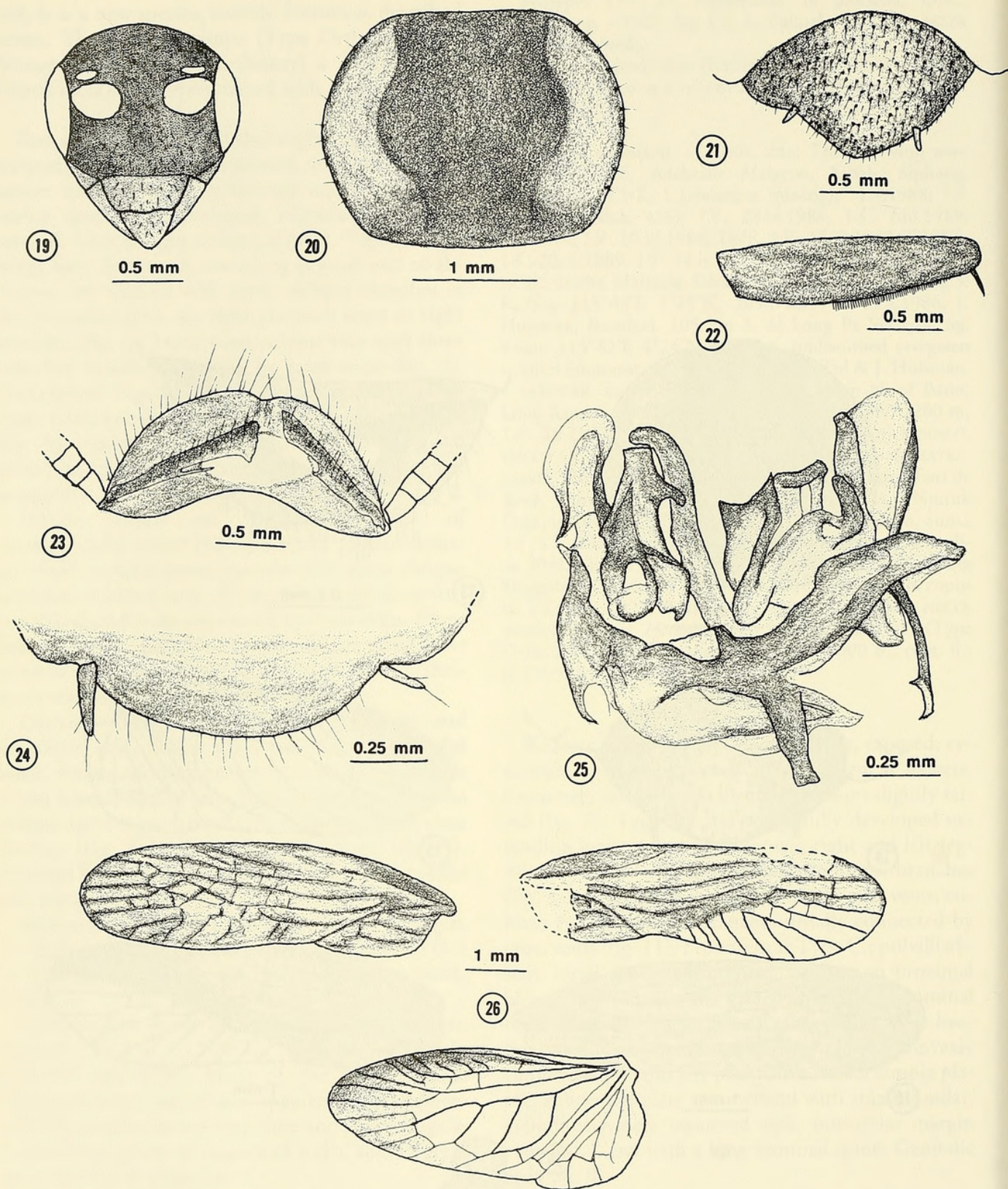
Colour. – Head dark reddish brown, ocellar spots whitish, distal part of clypeus yellowish, palpi dark reddish brown to blackish; proximal segments of antennae brown, remainder blackish. Pronotum with





Figs. 12-18. *Homopteroidea nigra* Shelford, males from Sipitang, Sabah. – 12, pronotum; 13, supraanal plate (dorsal); 14, subgenital plate (ventral); 15, left hind wing; 16, left tegmen; 17, right tegmen; 18, tarsal claws.



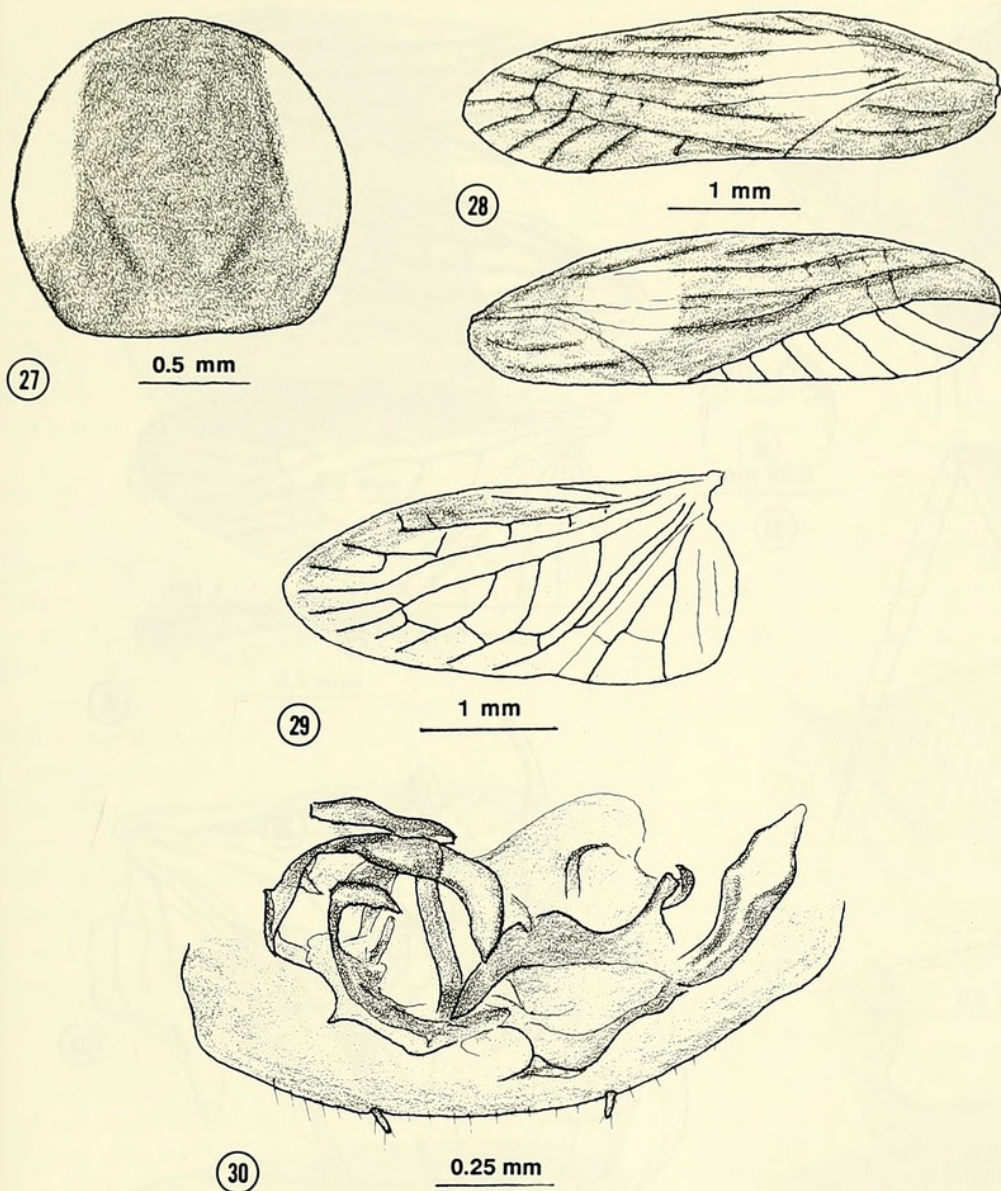


Figs. 19-26. *Homopteroidea nigra* Shelford, male from Perak. – 19, head; 20, pronotum; 21, subgenital plate (ventral); 22, front femur (anterior surface); 23, supraanal plate and paraprocts (ventral); 24, styli and interstyler margin of subgenital plate (dorsal); 25, genitalia (dorsal). 26, left and right tegmina, and left hind wing.

raised portions dark brown, about two thirds of the distal lateral zones yellowish white (in some females, white) (fig. 7). Tegmina brown, raised veins on dorsal surface dull yellowish, on ventral surface white, pre-

sutural zone on left tegmen brown, on right tegmen clear hyaline. Hind wing with subcostal and apical areas darkened, some veins distally white. Abdomen brown, supraanal plate with a clear hyaline macula.





Figs. 27-30. *Homopteroidea maculata* Hanitsch: 27, male pronotum; 28-29, female left and right tegmina, and left hind wing; 30, subgenital plate and genitalia (dorsal). (27, 30, from Sipora; 28, 29, from holotype).

Cerci brown. Legs brown, tarsi lighter.

Measurements (mm) (♀ in parentheses). – Length, 4.6-5.5 (4.5-5.3); pronotum length × width, 1.4-1.6 × 1.6-1.9 (1.3-1.6 × 1.6-1.8; tegmen length, 5.3-6.5 (5.0-6.7); interocular width, 0.7 (0.7-0.8).

Comments. – This species is very similar to *shelfordi* and Princis incorrectly synonymized it with that taxon. Karny's description of *nodipennis* is very complete and the specimens I have identified as this species agree closely with his description. One of the critical characters he mentioned (p. 160) was the presence of 'verkümmerten Haftläppchen' (rudimentary arolia), a structure absent in *shelfordi*.

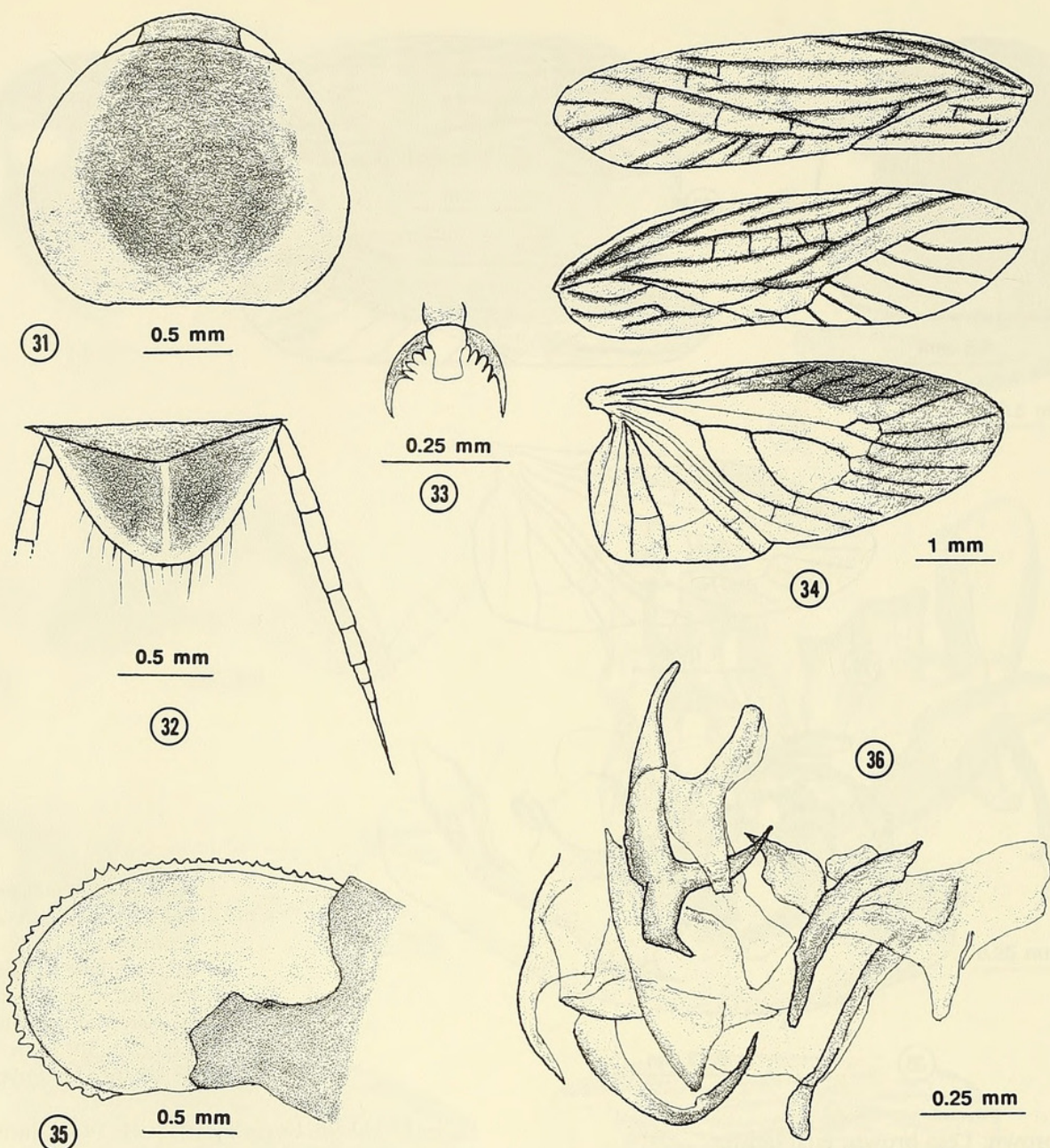
### *Homopteroidea nigra* Shelford (figs. 12-26)

*Homopteroidea nigra* Shelford, 1906: 274, pl. 16, figs. 13, 14 (♀); Hanitsch 1915: 127; 1923: 466; 1928: 37, 43; 1932a: 52, 80; 1932b: 6; 1933a: 303, 328; 1933b: 235;

Hebard 1929: 96; Bruijning 1948: 44, 146; Princis 1950: 162.

Type material. – Holotype ♀, Kuching, N.W. Borneo [SARAWAK], 9.x.1899, pres. 1905 by the Sarawak Museum; Type Orth. 205 in HECO [the specimen is fragmented with parts mounted on cards]. – Additional material: MENTAWE[A]I. HECO: Sipora, 1♂, 1♀, 1 (abdomen missing), v.-vi.1894, E. Modigliani, Mus. Civico Genova. MALAYSIA. HECO: Perak, F.M.S., Batang Padang, Jor Camp, 1800 ft., 1♂ (wing slide 272, terminalia slide 273.), 31.v.1923, H.M. Pendlebury. – SULAWESI (Celebes). HECO: Macassar, 1♂, 1896, Doherty, M. Burr Collection, pres. 1903 by M.B. – SABAH. ZILS: Malaysia, Sipitang, Mendolong, T2A/W4, 1♂, 1 (abdomen missing), 8.xii.1987, T1B/W4, 1♂ (terminalia slide 425), 15.iv. 1988, 1♀, 1 (abdomen missing), 20.iii.1988, 1 (abdomen missing), 8.iii.1989, T4/R, 1♂. 13.v.1988, T5/R, 2♂, 28.iv.1988, 1♂,





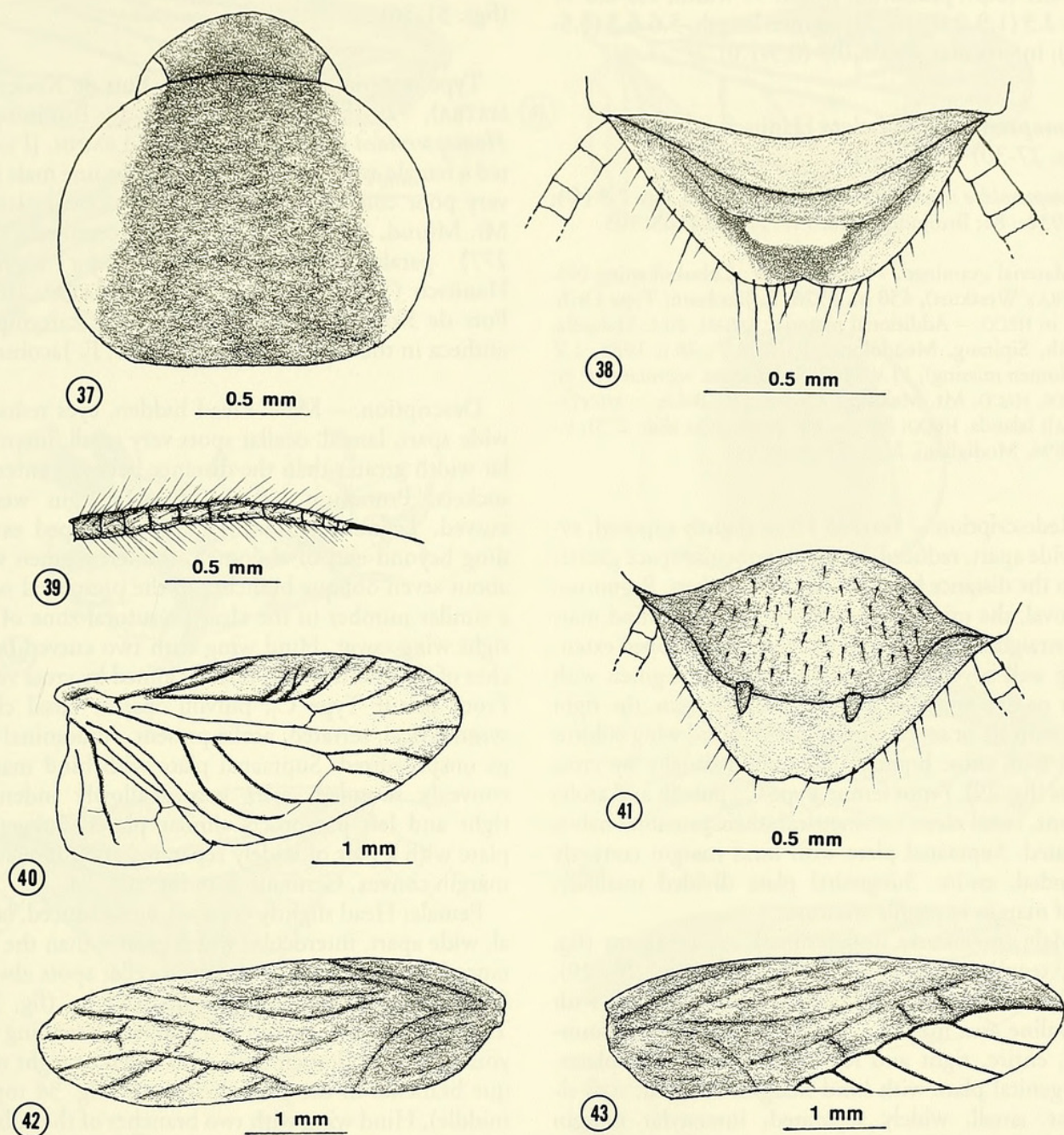
Figs. 31-36. *Homopteroidea biramiata* sp. n. – 31-34. female: 31, pronotum; 32, supraanal plate (dorsal); 33, tarsal claws and arolium; 34, left and right tegmina, and right hind wing; 35, ootheca (lateral); 36, male genitalia (dorsal). (31-33, from holotype; 34, 35, paratype from Fort de Kock, Sumatra; 36, paralectotype of *Homopteroidea shelfordi* from Mt. Murud, Sumatra).

3.v. 1988, 2 (abdomens missing), 11.v.1988. Two retained in MCZC.

**Description.** – Male (previously undescribed): Head globose, eyes reduced, widely separated, lateral, interocular space greater than the distance between antennal sockets, ocellar spots transverse (fig. 19); fifth maxillary palpomere swollen, about as long as the fourth, each shorter than the third. Pronotum suboval (figs. 12, 20). Tegmina and wings fully developed extending beyond end of abdomen; right tegmen with seven or eight oblique branches in the clear hyaline presutural zone (figs. 17, 26, top). Hind wing

cubitus vein with three branches that are distally joined by cross veins (figs. 15, 26, bottom). Front femur Type C<sub>1</sub>, with a dense row of almost contiguous pili-form spinuli (fig. 22); pulvilli and arolia absent, tarsal claws symmetrical basal half serrated (fig. 18). Abdominal terga unspecialized, supraanal plate hind margin convexly rounded, apex weakly indented (fig. 13), right and left paraprocts similar simple plates (fig. 23). Subgenital plate with a pair of small, similar, cylindrical widely separated styli, interstyler margin convexly rounded (figs. 14, 24). Cerci with a large terminal spine. Genitalia with complex phallomeres as in fig. 25.





Figs. 37-43. *Homopteroidea minor* Hanitsch, male from Sipitang, Sabah. – 37, pronotum; 38, supraanal plate (dorsal); 39, cercus; 40, right hind wing; 41, subgenital plate (ventral); 42, 43. left and right tegmina.

Female: Similar to male except for the subgenital plate which is deeply, longitudinally incised, the margins of the incision contiguous, the distal margin in profile truncate (as in figs. 50, 51).

Colour. – Head shiny black, clypeus, labrum, and mandibles light brown, ocellar spots yellowish white or white (fig. 19); antennae dark brownish or black with about 15 terminal white segments (Shelford described the antenna as being fuscous; the fragmented holotype lacks antennae and they probably lacked the distal antennomeres when it was originally described; several specimens from Sabah had some white antennomeres and one which appeared to have undamaged

antennae had 15 white segments but in most specimens segments are missing and these have fewer or no white antennomeres.); maxillary and labial palpi black. Pronotum with raised portion black or dark brown, broad lateral zones lighter reddish brown (figs. 12, 20). Tegmina dark reddish brown except for the clear zone in the presutural area of the right wing cover (figs. 16, 17, 26 top). Hind wing with costal veins and apical region infuscated (figs. 15, 26 bottom). Abdomen dark brown, supraanal plate with a large clear hyaline area (figs. 13, 23; absent in female). Legs with femora brownish, tibiae and tarsi pale.

Measurements (mm) (♀ in parentheses). – Length,



5.2-6.1 (6.3); pronotum length  $\times$  width, 1.8-2.0  $\times$  2.1-2.3 (1.9-2.0  $\times$  2.3); tegmen length, 5.6-6.3 (5.5-5.8); interocular width, 0.9 (0.9-1.0).

***Homopteroidea maculata* Hanitsch**  
(figs. 27-30)

*Homopteroidea maculata* Hanitsch, 1929: 266, figs. 7-9 (♀); 1932a: 81; Bruijning 1948: 147; Princis 1963: 105.

Material examined. – Holotype, ♀, Lubuksikaping (SUMATRA's Westkust), 450 m, 1926, E. Jacobson; Type Orth. 363 in HECO. – Additional material: SABAH. ZILS: Malaysia, Sabah, Sipitang, Mendolong, T5/R, 1 ♀, 28.iv.1988, 1 ♀ (abdomen missing), 11.v.1988, S. Adebratt. – PHILIPPINE ISLANDS. HECO: Mt. Makiling, Luzon, 1 ♀, Baker. – MENTAWE[A] Islands. HECO: Sipora, 1 ♂ (terminalia slide 275), v.-vi.1894, Modigliani, Mus. Civ. Genova.

Redescription. – Female: Head slightly exposed, eyes wide apart, reduced, lateral, interocular space greater than the distance between antennal sockets. Pronotum suboval, the midregion shallowly cucullate, hind margin straight. Tegmina and wings fully developed extending well beyond end of abdomen, left tegmen with four or five branches of the presutural vein, the right one with six or seven rami (fig. 28). Hind wing cubitus vein with three branches connected distally by cross veins (fig. 29). Front femur Type C<sub>1</sub>, pulvilli and arolia absent, tarsal claws symmetrical, their proximal halves serrated. Supraanal plate with hind margin convexly rounded, entire. Subgenital plate divided medially, hind margin in profile truncate.

Male (previously undescribed). – Pronotum (fig. 27), tegmina and wings as in female (fig. 28, 29). Abdominal terga unspecialized. Supraanal plate with a hyaline area medially, hind margin convexly rounded, entire, right and left paraprocts similar plates. Subgenital plate with hind margin rounded, styli similar, small, widely separated, interstyler margin weakly curved (fig. 30). Genitalia as in fig. 30.

Colour. – Head dark brown, labrum and lower half of clypeus lighter; antennae dark brown; maxillary palpomeres grayish. Pronotal disk with cucullate portion dark brown, about two thirds of the lateral regions lighter or whitish (fig. 27). Left tegmen brown with a brownish yellow hyaline macula on anterior half; right tegmen similarly coloured except that the presutural vein area is colourless-hyaline (fig. 28). Abdomen brown. Legs brown, tarsi lighter.

Measurements (mm). – Length, 4.5 (5.0-5.2); pronotum length  $\times$  width, 1.5  $\times$  1.6 (1.4-1.6  $\times$  1.6-2.0); tegmen length, 4.5 (4.0-5.6); interocular width, 0.8 (0.7-0.8).

Comments. – The species is readily recognized by the hyaline mark on the proximal half of each tegmen.

***Homopteroidea biramiata* sp. n.**  
(figs. 31-36)

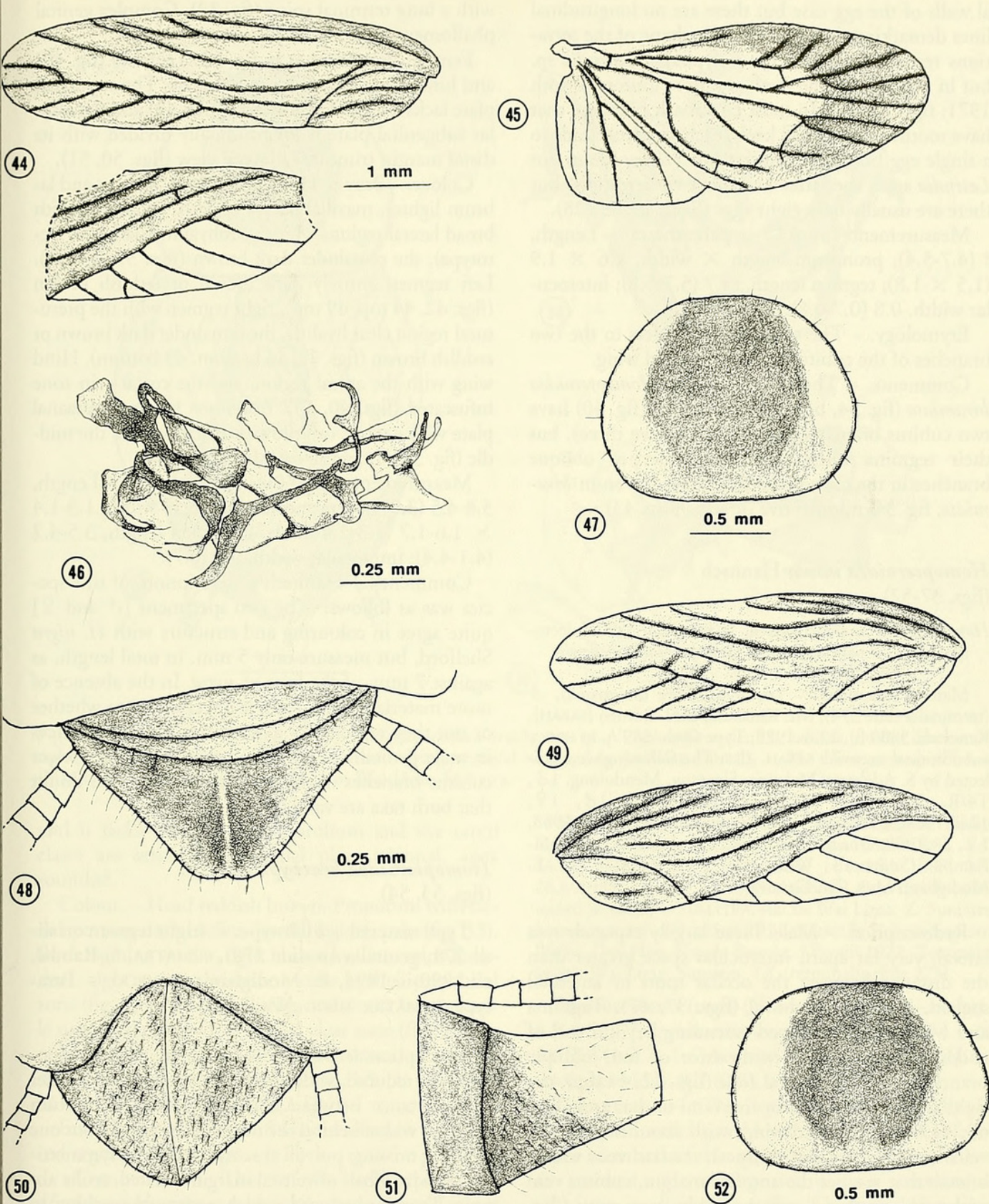
Type material. – Holotype, ♀, Fort de Kock (SUMATRA), 920 m, E. Jacobson (det. by Bruijning as *Homopteroidea shelfordi* Hanitsch); in RMNH. [I selected a female as the holotype because the one male is in very poor condition]. – Paratypes. SARAWAK. HECO: Mt. Murud, Sarawak, 6500 ft., 1 ♂ (terminalia slide 277) paralectotype of *Homopteroidea shelfordi* Hanitsch (Type Orth., 206<sup>3/4</sup>). – SUMATRA. HECO: Fort de Kock (Sumatra), 920 m, 1 ♀ (carrying an ootheca in the vertical position), 1925, E. Jacobson.

Description. – Male: Head hidden, eyes reduced, wide apart, lateral, ocellar spots very small, interocular width greater than the distance between antennal sockets. Pronotum suboval, hind margin weakly curved. Tegmina and wings fully developed extending beyond end of abdomen, the left tegmen with about seven oblique branches in the presutural zone, a similar number in the clear presutural zone of the right wing cover. Hind wing with two curved branches of the cubitus vein, distally joined by cross veins. Front femur Type C<sub>1</sub>, pulvilli absent, tarsal claws symmetrical, serrated, arolia present. Abdominal terga unspecialized. Supraanal plate with hind margin convexly rounded, apex very shallowly indented, right and left paraprocts similar plates. Subgenital plate with a pair of widely separated styli, interstyler margin convex. Genitalia as in fig. 36.

Female: Head slightly exposed, eyes reduced, lateral, wide apart, interocular width greater than the distance between antennal sockets, ocellar spots absent. Pronotum suboval, hind margin straight, (fig. 31). Tegmina and wings fully developed extending beyond end of abdomen both with seven or eight oblique branches in the presutural zones (fig. 34 top & middle). Hind wing with two branches of the cubitus vein, distally connected by cross veins (fig. 34 bottom). Front femur Type C<sub>1</sub>, pulvilli absent, tarsal claws symmetrical, serrated on their proximal halves, arolia present (fig. 33). Supraanal plate subtrigonal, apex rounded (fig. 32). Subgenital plate divided longitudinally the distal margin truncate in profile. Cerci with a terminal spine (fig. 32).

Colour. – Head reddish brown, clypeus, labrum, and mandibles yellowish brown, maxillary palpi blackish; antennae brown. Pronotum dark reddish brown, the lateral proximal two thirds whitish (fig. 31). Tegmina brownish hyaline, the presutural zone of the right one clear hyaline (fig. 34 middle). Hind wing infuscated darkest in the costal and apical zones (fig. 34 bottom; ♂ wing darker than the ♀). Abdomen brown, male supraanal plate with a hyaline macula. Cerci and legs brown, tarsi lighter.





Figs. 44-52. *Homopteroidea minor* Hanitsch. 44-47, male lectotype. – 44, left and right (damaged) tegmina; 45, right hind wing; 46, genitalia (dorsal); 47, pronotum. – 48-52, female from Sipitang, Sabah: 48, supraanal plate (dorsal); 49, left and right tegmina; 50, subgenital plate (ventral); 51, subgenital plate (lateral); 52, pronotum.

**Ootheca.** – The ootheca carried by the female (fig. 35) measures 1.3 mm high and 2 mm long. It is white and has about 40 variably shaped serrations in the

keel. The serrations contain respiratory tubes that allow air to reach the eggs. There is a yellowish (yolk-like) swelling internally that distends part of the later-



al walls of the egg case but there are no longitudinal lines demarking the egg cells. The shape of the serrations resemble those of the polyphagid *Latindia* sp. but in that species the teeth are more uniform (Roth 1971: figs. 12, 13). In most cockroach oothecae that have toothed or serrated keels, each serration leads to a single egg but this is not true in *Homopteroidea* or *Latindia* spp.; the latter has about 60 serrations but there are usually only eight eggs (Roth 1971: 128).

Measurements (mm) (♀ in parentheses). – Length, ? (4.7–5.4); pronotum length  $\times$  width, 1.6  $\times$  1.9 (1.5  $\times$  1.8); tegmen length, ca 7 (5.7–5.8); interocular width, 0.8 (0.7–0.8).

Etymology. – The specific name refers to the two branches of the cubitus vein of the hind wing.

Comments. – The hind wings of *Homopteroidea biramiata* (fig. 34, bottom), and *minor* (fig. 40) have two cubitus branches (other species have three), but their tegmina differ in the number of oblique branches in the clear presutural zones (seven in *biramiata*, fig. 34, middle; five in *minor*, fig. 43).

### *Homopteroidea minor* Hanitsch (figs. 37–52)

*Homopteroidea minor* Hanitsch, 1933a: 303, 328 (♂ lectotype only; ♀ paralectotype = *Homopteroidea shelfordi*).

Material examined. – Lectotype (here designated), ♂ (terminalia slide 274), Mt. Kinabalu, B.N. Borneo [SABAH], Kenokok, 3300 ft., 22.iv.1929; Type Orth. 389<sup>1</sup>/<sub>2</sub>, in HECO. – Additional material: SABAH. ZILS: The following were collected by S. Adebratt: Malaysia, Sipatang, Mendolong, 1♂, T4/R, 1♀, T6/R, 14. iii.1989, T3/W5, 1♂, 1♀, 17.iii.1989, T5/R, 1♀, 1 (abdomen missing), 28.iv. 1988, 1♀, 1.v.1988. One retained in MCZC. – SUMATRA. HECO: Si-Rambé (Sumatra's Westkust), 1♂, xii.90–iii.91, E. Modigliani, Mus. Civ. Genova.

Redescription. – Male: Head largely exposed, eyes lateral, very far apart, interocular space greater than the distance between the ocellar spots or antennal sockets. Pronotum suboval (figs. 37, 47). Tegmina and wings fully developed extending beyond end of abdomen; left tegmen with three or four oblique branches in the presutural zone (figs. 42, 44 top), the right tegmen with four or five rami in that area (figs. 43, 44 bottom). Hind wings with about three costal veins (only their bases distinct), median vein with a branch that reaches the anterior margin, cubitus vein with two branches distally joined by cross veins (figs. 40, 45). Front femur Type C<sub>1</sub>; pulvilli and arolia absent, tarsal claws symmetrical, distinctly toothed. Abdominal terga unspecialized. Supraanal plate ample, the distal region turned upwards its apex weakly indented (fig. 38). Subgenital plate symmetrical with a pair of small, similar, widely separated styli, interstyler margin not produced (fig. 41). Cerci

with a long terminal spine (fig. 39). Complex genital phallomeres as in fig. 46.

Female: Pronotum as in fig. 52. Tegmina (fig. 49) and hind wing are similar to the male. The supraanal plate lacks a medial hyaline spot (fig. 48) and the astylar subgenital plate is longitudinally divided with its distal margin truncate in lateral view (figs. 50, 51).

Colour. – Brown. Head dark brown, clypeus and labrum lighter, maxillary palpi grayish. Pronotum with broad lateral regions whitish subhyaline (darker in lectotype), the remainder dark brown (figs. 37, 47, 52). Left tegmen entirely dark brown or reddish brown (figs. 42, 44 top, 49 top), right tegmen with the presutural region clear hyaline, the remainder dark brown or reddish brown (figs. 43, 44 bottom, 49 bottom). Hind wing with the apical region, and the costal vein zone infuscated (figs. 40, 45). Abdomen brown, supraanal plate with a white or yellowish macula across the middle (fig. 38). Legs and cerci lighter brown.

Measurements (mm) (♀ in parentheses). – Length, 3.8–4.5 (3.8–4.6); pronotum length  $\times$  width, 1.3–1.4  $\times$  1.6–1.7 (1.3–1.4  $\times$  1.7); tegmen length, 3.5–4.2 (4.1–4.4); interocular width, 0.7 (0.7).

Comments. – Hanitsch's 'description' of this species was as follows: 'The two specimens [♂ and ♀] quite agree in colouring and structure with *H. nigra* Shelford, but measure only 5 mm. in total length, as against 7 mm. of the type of *nigra*. In the absence of more material I must leave it uncertain as to whether or not they represent a new species.' The differences in male genitalia, tegmen and wing structure (fewer cubitus branches in *minor*) and size, leave no doubt that both taxa are valid.

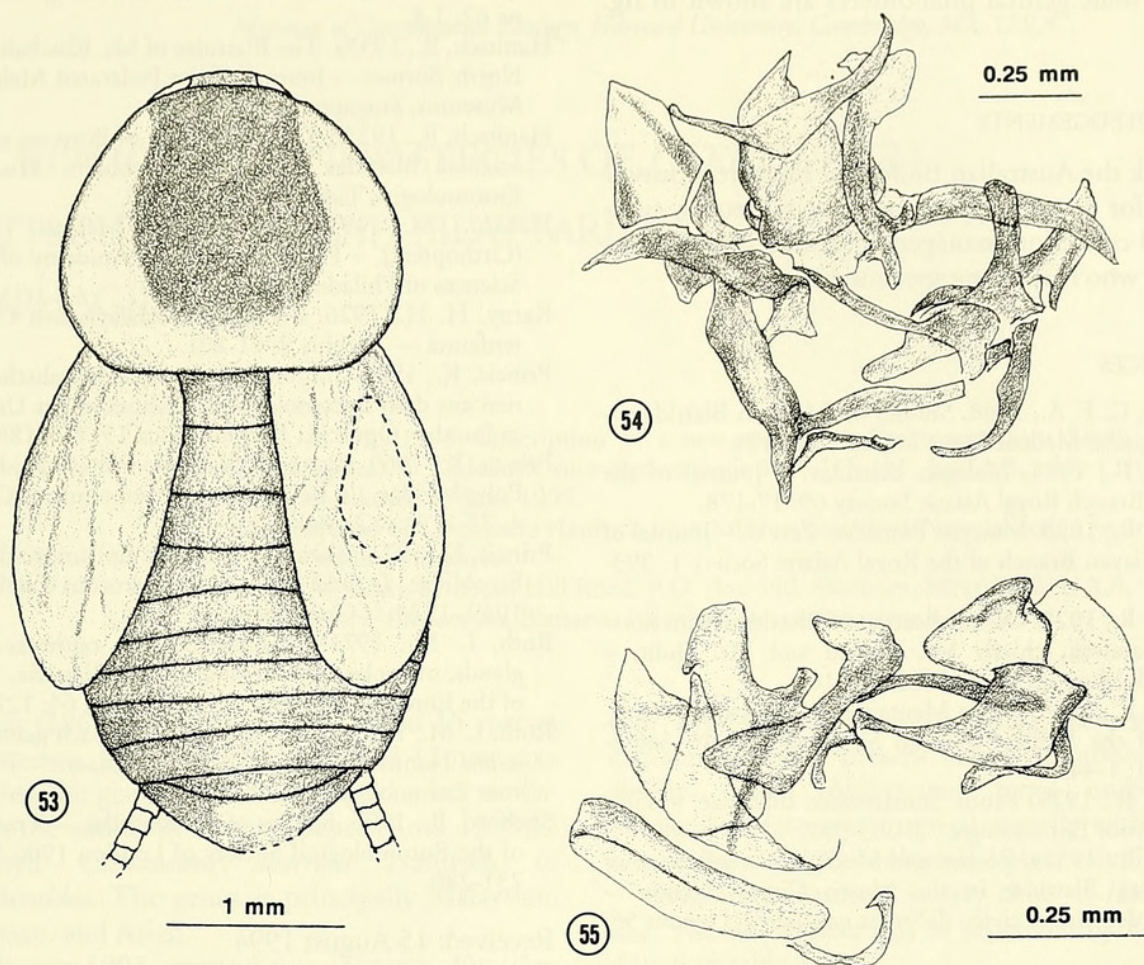
### *Homopteroidea brachyptera* sp. n. (figs. 53, 54)

Type material. – Holotype, ♂ (right tegmen on slide 271, genitalia on slide 278), SUMATRA, Si-Rambé, xii.1890–iii.1891, E. Modigliani; in HECO. – Paratype. SUMATRA. HECO: Wai Lima, 1♀.

Description. – Male: Head globose, slightly exposed, eyes reduced, wide apart, interocular space greater than distance between antennal sockets. Pronotum suboval, widest behind the middle (fig. 53). All but one hind leg missing; pulvilli absent, tarsal claws symmetrical, proximal half of ventral margin serrated, arolia absent. Tegmina reduced, widely separated reaching to about the sixth segment, venation indistinct; hind wing vestigial (fig. 53). Supraanal plate hind margin convexly rounded (fig. 53), right and left paraprocts similar simple plates. Genitalia as in fig. 54.

Female: The specimen is in very poor condition and mounted on a card. Tegmina are reduced and hind wings are vestigial. Only one hind leg is present





Figs. 53-55. *Homopteroidea* spp. – 53-54. *Homopteroidea brachyptera* sp. n., holotype male: 53, habitus (dotted line on the right tegmen shows the outline of the underlying vestigial wing); 54, genitalia (dorsal). – 55. *Homopteroidea aberrans* (Hanitsch), male genitalia (dorsal), from Wai Lima, Sumatra.

and it lacks pulvilli and an arolium and the tarsal claws are serrated. Supraanal plate trigonal, apex rounded.

Colour. – Head reddish brown. Pronotum with raised portion dark brown, lateral regions pale (fig. 53). Both tegmina similar, light brown hyaline, veins indistinct, right tegmen without a clear hyaline presutural zone (fig. 53). Abdominal terga and sterna brown, male supraanal plate with a medial clear zone (fig. 53).

Measurements (mm) (♀ in parentheses). – Length, 4.1; pronotum length × width, 1.5 × 1.8 (1.2 × 1.8); tegmen length, 1.9 (2.1).

Etymology. – The specific name refers to the reduced tegmina and wings.

Comments. – This is the only species of *Homopteroidea* whose tegmina are reduced and wings are vestigial.

***Homopteroidea aberrans* (Hanitsch) comb. n.**  
(fig. 55)

*Ctenoneura aberrans* Hanitsch. – Roth 1993: 86, fig. 1 (re-described ♀ and described ♂).

Material examined. – SABAH. ZILS: Malaysia, Sabah, Sipitang, Mendolong, T5/R, 1♂, 6.v.1988, T4/R. 1♂, 14.iii.1989, A1L, 1♂, 8.iv.1988, 1♂, 25.iv.1988, 1♂, 26.iv.1988, 1♂, 5.v. 1988, S. Adebratt. One specimen retained in MCZC. – SUMATRA. HECO: Wai Lima, Z. Sumatra, Lampongs, 2♂, 2♀, xi.-xii.1921, Karny & Siebers; Sumatra Binjei, Deli Hoa, Kapala Roessu, 1♀, viii.1922, Toxopeus. MCZC: Wai Lima, Sumatra, 1♂ (terminalia slide 275).

Measurements (mm) (♀ in parentheses). – Length, 4.0-4.3 (4.7); pronotum length × width, 1.0-1.2 × 1.6-1.8 (1.2 × 1.6); tegmen length, 4.0-4.5 (4.4); interocular width, 0.7 (0.8).

Comments. – This species was originally in *Ctenoneura*, and I considered it to be atypical from other members of that genus because its tarsal claws are serrated and its subgenital plate is symmetrical with two small similar styles. These are diagnostic characters of *Homopteroidea* and I am therefore transferring *aberrans* to that genus. However, it may be considered 'aberrant' in this genus because the presutural zone of the right tegmen is not clear hyaline, the curved branches of the cubitus vein are not connected by cross veins, and the male supraanal plate lacks a hyaline macula (Roth 1993: figs. 1C,



E). The male genital phallomeres are shown in fig. 55.

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