

ON THE IDENTITY OF THE CICADA SPECIES

POMPONIA PICTA (WALKER) (= *P. FUSCA* (OLIVIER))

AND *P. LINEARIS* (WALKER) (HEMIPTERA,

CICADIDAE)

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This study re-establishes the identity of *Pomponia fusca* (Olivier, 1790), type species of the genus *Pomponia* Stål, 1866, as a result of a study of the descriptions and figures of this species given by Stoll (1781) and Olivier (1790, 1797). The description and figure of 'De Bruine Zanster' (in Dutch) or 'La Cigale Chanteuse Brune' (in French) by Stoll (1781) has provided the basis for the description and figure of *Pomponia fusca* (Olivier, 1790). Because *Cicada fusca* Olivier is a junior primary homonym of *Cicada fusca* Müller, 1776, the name *P. fusca* is replaced here by *Pomponia picta* (Walker, 1868). A description of *P. picta* (= *P. fusca*), figures of body, operculum and male genitalia, and a distribution map are provided. *P. picta* is probably endemic to the islands of Sumatra and Nias, Indonesia. *P. fusca* and *Pomponia linearis* (Walker, 1850) were supposed to be synonyms but a study of the type specimen of *P. linearis* from unknown locality has re-established *P. linearis* as a separate species. This paper provides a description of *P. linearis*, figures of body, operculum and male genitalia, and a distribution map. This species occurs in Assam (India), Bhutan, Nepal, Thailand and Vietnam.

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The genus *Pomponia* Stål, 1866 comprises a very heterogeneous group of species. Beuk (2002) showed that the *Pomponia* species grouped around *P. imperatoria* (Westwood, 1842) are more closely related to *Platylochia flavida* (Guérin-Méneville) and to the species of the *Platylochia radba* (Distant) group than to other species of *Pomponia*. Recently, Boulard (2005) erected *Megapomponia* n. gen. for the large *Pomponia* species, with *P. imperatoria* as the type species of the genus. Further revisionary taxonomic studies of *Pomponia* are in progress. A number of species attributed to *Pomponia* should be transferred to other genera, such as *Terpnosia* Distant, *Leptosemia* Matsumura, etc.

The taxonomic study of the genus *Pomponia* was strongly hampered for a long time by the existing uncertainty about the identity of the type species of the genus: *Pomponia fusca* (Olivier, 1790). The identity of *P. fusca* became even more puzzling since Distant (1891, 1906, 1912) listed *Pomponia linearis* (Walker, 1850) as a synonym of *P. fusca*.

The present study aims to establish the identities of *P. fusca* and *P. linearis*, which prove to be quite different species. For nomenclatorial reasons the name *P. fusca* is replaced by *Pomponia picta* (Walker, 1868). *P. picta* (figs. 1, 3-7) and *P. linearis* (figs. 2, 9-12) are described and their distributions are mapped (figs. 8, 13).

THE SYNONYMY AND IDENTITY OF *POMPONIA FUSCA*
AND *P. LINEARIS*

History

After the Distant epoch (e.g. 1891, 1906, 1912), when *Pomponia linearis* (Walker, 1850) was regarded as a synonym of *P. fusca*, Moulton (1923) was the first author to regard *P. fusca* and *P. linearis* again as two different species. According to Moulton (l.c.), *Pomponia fusca* (Olivier) has been used as a 'blanket name' for a number of distinct species. He stated that study of the type is necessary to establish the identity of the true *fusca*. Moulton (l.c.) distinguished *P. linearis* from its close allies, including *P. fusca*, by the third spot at the hind margin of the tegmen being twice as long as the other marginal spots. Later authors followed Distant and used either the name *P. fusca*, sometimes with *Dundubia linearis* Walker as a junior synonym (e.g. Kato, 1961), or *P. linearis*, sometimes with *Cicada fusca* as a junior synonym (e.g. Hayashi, 1974, 1978). The catalogues by Metcalf (1962, 1963) and Duffels & Van der Laan (1985), that together cover the cicada literature until the end of 1980, use the name *Pomponia linearis* (Walker, 1850) with *Pomponia fusca* (Olivier) as a synonym. In these catalogues, the name *Pomponia fusca* (described as *Cicada fusca* Olivier, 1790) was replaced by *Pomponia linearis* (Walker, 1850), because *Cicada fusca* Olivier, 1790 is a junior primary homonym of *Cicada fusca* Müller, 1776.

The identity of *Pomponia fusca*

Olivier (1790) described 66 species of the genus *Cicada*, and depicted 37 (Olivier, 1797). Some of these species were described for the first time, e.g. *Cicada tomentosa*, *C. atra*, and *C. argentata* from France, but the descriptions of by far the most species were copied from previous authors: Linnaeus (1758), Fabricius (1775, 1787), Stoll (1780-1788) and others. Olivier's description (1790) and figure (1797) of the cicada named 'Cigale noiratre' in French and '*Cicada fusca*' in Latin are copies of the description and figure of 'De Bruine Zanster' or 'La Cigale Chanteuse Brune' described by Caspar Stoll in his 'Natuurlijke en naar 't leeven naauwkeurig gekleurde afbeeldingen en beschrijvingen der Cicaden en Wantzen in alle vier waerelds deelen Europa, Asia, Afrika en America etc.' (1780-1788).

Stoll's book was published in 12 parts between 1780 and 1788 (Horn & Schenkling 1929). Each part contains text and plates on 'Cicaden' (cicadas) as well as 'Wantzen' (bugs); the pages and plates on the two groups were separately numbered. 'De Bruine Zanster' or 'La Cigale Chanteuse Brune' was described and depicted in part 4 (1781: 39, pl. vii fig. 36), that contains the pages 37-40 and plates

vii-viii on cicadas, and the pages 53-60 and plates xiii-xvi on bugs. After publication of all 12 parts, cicadas and bugs were separately published in two volumes in 1788. The cicada book bears the title: 'Natuurlijke en naar 't leeven naauwkeurig gekleurde afbeeldingen en beschrijvingen der Cicaden in alle vier waerelds deelen Europa, Asia, Afrika en America' (see p. 39, pl. vii fig. 36 for the description of 'De Bruine Zanster' in Dutch or 'La Cigale Chanteuse Brune'). The names in Stoll's publications of 1780-1788 and 1788 are not available because the author did not apply the principles of binominal nomenclature (articles 5 and 11 of the 'International Code of Zoological Nomenclature').

Since Olivier's description and figure of *Cicada fusca* does not deviate in any detail from Stoll's description and figure of 'De Bruine Zanster' or 'La Cigale Chanteuse Brune', it is most likely that Stoll's work was the only source of information for the description of the species and that Olivier did not study any material of *Cicada fusca*.

The specimens of 'De Bruine Zanster' or 'La Cigale Chanteuse Brune' studied by Stoll have not been found in spite of an extensive search in collections in The Netherlands and elsewhere. A search for specimens of *Cicada fusca* studied by Olivier in the collection of the Paris Museum was also unsuccessful. This means that Stoll's description and specially his drawing of 'De Bruine Zanster' or 'La Cigale Chanteuse Brune' provide the most reliable information to establish the identity of *Cicada fusca*.

Recently, Boulard (2001b) published a paper on the identity of *Cicada fusca* Olivier. Boulard (l.c.) considered Stoll's drawing as the 'iconotype' of the species and redescribed this species after three male specimens from Indonesia, Sumatra, Muora Sako. Our study of the genus *Pomponia* in recent years confirmed Boulard's conclusions with regard to the identity of Stoll's 'De Bruine Zanster' or 'La Cigale Chanteuse Brune', which was redescribed as *Cicada fusca* by Olivier (1790, 1797).

A new name for *Pomponia fusca*: *P. picta*

Cicada fusca Olivier, 1790 is a junior primary homonym of *Cicada fusca* Müller, 1776. For this reason the name *Cicada fusca* Olivier was replaced by *Pomponia linearis* Walker in Metcalf (1962, 1963), and later in Duffels & Van der Laan (1985). This is untenable since the present research reveals that *P. fusca* and *P. linearis* are different species. Comparison of Stoll's figure of 'De Bruine Zanster' (*Cicada fusca*) with identified specimens of various species of *Pomponia* from Sumatra in the collections of the Zoologisch Museum, Amsterdam and the Nationaal Natuurhistorisch Museum, Leiden, already suggested the possible synonymy of *Pomponia fusca* (Olivier,

1790) and *Pomponia picta* (Walker, 1868). Study of the holotype of *Dundubia picta* revealed that this species shows the same characteristic features as figured by Stoll for 'De Bruine Zanster'. The holotype of *Dundubia picta* in the collection of the Natural History Museum, London, is a male, though Walker (1868) indicated that the species was described after a female. *P. picta* is proposed here as the new name for *P. fusca*.

The identity of *Pomponia linearis*

Walker (1850) described *P. linearis* after a male without locality. Moulton (1923) used the name *Pomponia linearis* for records of *P. linearis* from Sylhet and Assam (Atkinson, 1885) and records of *P. fusca* from India, Malay Archipelago, Java, Philippines, Japan, China and Taiwan (Distant, 1891, 1906, 1912). Moulton (l.c.) distinguished *P. linearis* from its nearest allies by two characters: third spot at hind margin of tegmen twice as long as other marginal spots, and the presence of a broad pale transverse band across the face (= postclypeus). But, Moulton (1923) stressed that the revival of *Pomponia linearis* from the synonymy of *Pomponia fusca* must be confirmed.

In the literature, *P. linearis* has been recorded from many localities ranging from India in the west, and Taiwan and the Ryukyu Islands (Japan) in the east (Metcalf, 1962, 1963; Duffels & Van der Laan, 1985). We have studied a large number of specimens identified as *P. linearis* from various collections; the specimens came from Taiwan, Japan (Ryukyus), South China, Vietnam, Malayan Peninsula, Borneo, Thailand, Bhutan, Nepal, Assam, and Sylhet. These specimens represent a number of different species, of which most are undescribed. Comparison of this material with the type specimen of *P. linearis* lead to the conclusion that selected specimens from Assam, Bhutan, Nepal, Thailand and Vietnam belong to *P. linearis* (fig. 13).

The characters that are mentioned by Moulton (1923) no longer suffice to separate *P. linearis* from its close relatives. The long third spot at the hind margin of the tegmen of *P. linearis* is not found in other described species of the *linearis* species complex (see the discussion preceding the description of *Pomponia linearis* below), but the character is found in *Pomponia fusca yayeyamana* Kato, 1933 described from the Ryukyu Islands. The taxonomic status of the latter taxon will be discussed in a forthcoming paper. The broad pale transverse band across the postclypeus, also mentioned as a character for *P. linearis* by Moulton (l.c.), is found in all species of the *P. linearis* species group (see taxonomy paragraph below). The present study lead to the conclusion that *P. linearis* can be distinguished from its closest relatives in the *linearis* species complex by two

characters of the male genitalia: (1) the presence of a pair of oblique, paramedian, basal pygofer lobes and (2) the straight lateral spine of the clasper which is distinctly longer than the medial spine.

Boulard (2003) depicted a photograph of a male and female of *Pomponia linearis* from Doi Mon Kia, Thailand (Boulard 2003: fig. 4). The shape and size of the bodies and the marking on the tegmina suggest that these specimens belong to the real *linearis*. The drawings of the male genitalia in ventral view (Boulard 2003: fig. 6) show a pair of acute lateral pygofer lobes, which is characteristic for the *P. linearis* group, but the two completely separated uncus lobes and the absence of basal pygofer lobes make it unlikely that this is really *P. linearis*.

DEPOSITORIES

BMNH	Natural History Museum, London (former British Museum (Natural History)), UK
IZUI	Institut für Zoologie der Universität Innsbruck, Innsbruck, Austria
KBIN	Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel, Belgium
MNP	Muséum National d'Histoire Naturelle, Paris, France
NHMW	Naturhistorisches Museum, Wien, Austria
RMNH	Nationaal Natuurhistorisch Museum (former Rijksmuseum voor Natuurlijke Historie), Leiden, The Netherlands
SUU	Saitama University, Saitama, Japan
ZMAN	Zoölogisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands
ZSM	Zoologische Staatssammlung, München, Germany

TAXONOMY

Two species of the genus *Pomponia* are described below: *Pomponia picta* (Walker, 1868) (= *Cicada fusca* Olivier, 1790) and *Pomponia linearis* (Walker, 1850). These species were regarded synonyms for many years. The descriptions and figures of the two species illustrate the heterogeneous nature of the present genus *Pomponia*. It is beyond dispute that the two species belong to quite different groups that most probably should be assigned generic rank. *P. picta* is the type species of *Pomponia*; its identity is crucial in designing a new concept for the genus.

Pomponia picta (Walker) (figs. 1, 3-8)

Cicada fusca Olivier, 1790: 749; Olivier, 1797: pl. 111 fig. 3 [*Cicada fusca* Olivier is a junior primary homonym of *Cicada fusca* Müller, 1776].

Dundubia picta Walker, 1868: 90. ♂ holotype: INDONESIA:



Figs. 1-2. *Pomponia* species, male habitus. – 1, *P. picta*, Sumatra, Mt. Dempo; 2, *P. linearis*, Assam, Shillong. Scale :1 cm.

'Sumat [= Sumatra; handwritten] / Wallace [printed between two lines]', '67/66', 'picta', 'type' [printed on round label with green circle], (BMNH).

Pomponia linearis partim; Metcalf 1963: 845-849 (*fusca* as synonym); Duffels & Van der Laan 1985: 176-177 (*fusca* as synonym).

Pomponia fusca; Boulard 2001b: 158-159, figs. 1-3.

Pomponia picta; Metcalf 1963: 851.

Misidentifications of *P. fusca*:

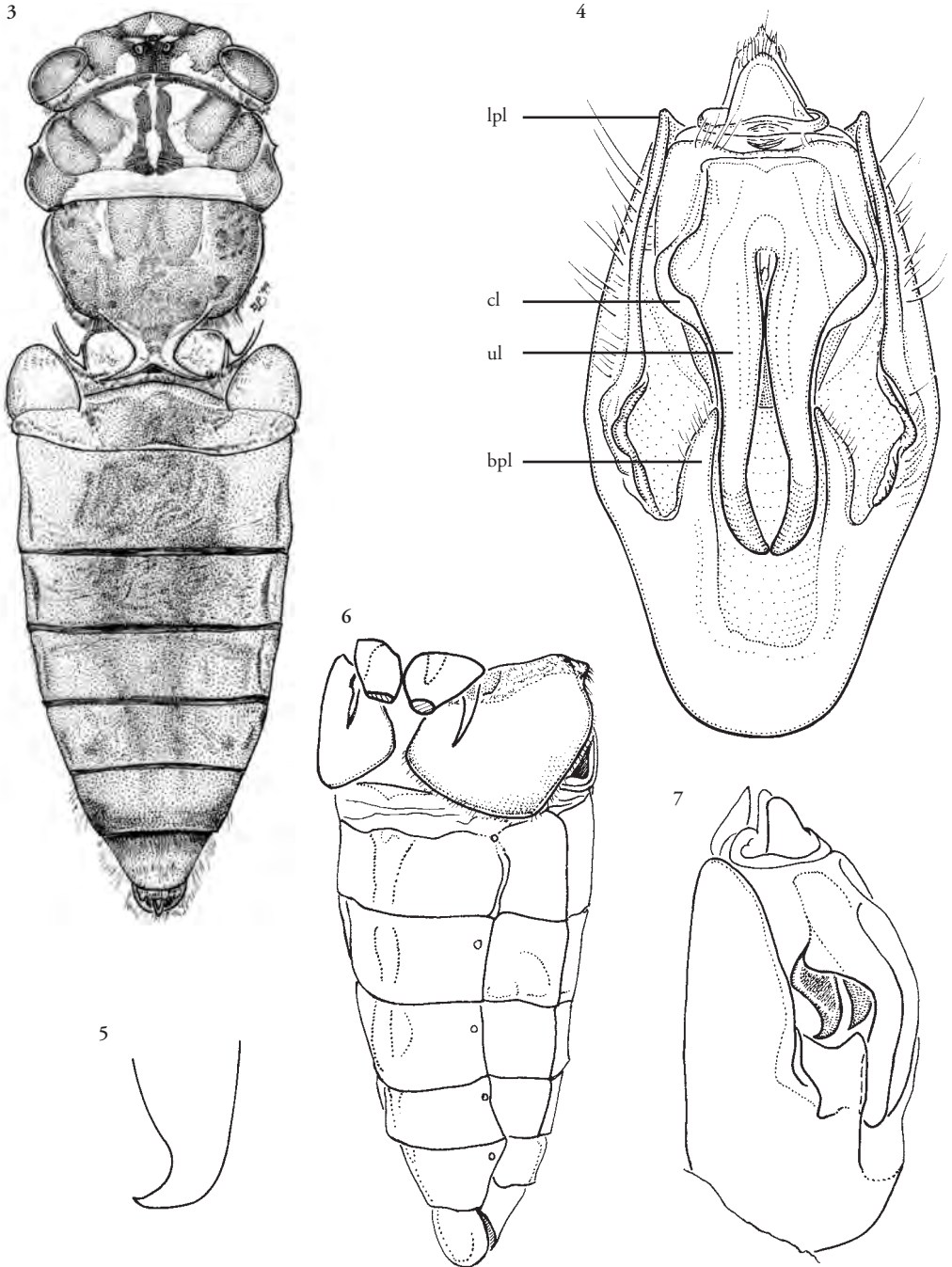
Pomponia fusca; Boulard 2000: 62-65, figs 14-17 (= *Pomponia dolosa* Boulard; see Boulard 2001b); Boulard 2001a: 133, 139, pl. 2 figs. I, J (= *Pomponia dolosa*; see Boulard 2001b).

Pomponia picta; Distant 1891: pl. vii fig. 11a, b (this figure probably depicts *Pomponia similis* Schmidt; see also Moulton & China 1926).

Pomponia fusca has been used as a 'blanket name' for a number of distinct species. Almost all refer-

ences to *fusca* refer to other species or to a mixture of described and undescribed species from various localities. Therefore, the references are confined to the original descriptions of *P. fusca* (and *P. picta*), the catalogues of cicada literature and some other relevant publications. The existing confusion in the literature about the identity of *P. picta* is mainly caused by Distant's figure (1891: pl. vii fig. 11a, b) of this species that does not depict *P. picta*.

Pomponia picta is a medium-sized species (expansion of tegmina 92-103 mm) with a broad head, a slightly swollen postclypeus, a reddish brown to dark brown marking on a greenish yellow ground colour on head and thorax, and a slender male abdomen (figs. 1, 3). *P. picta* can be separated from the species of the *linearis* group by (1) two series of transverse brown lines on the underside of the postclypeus, instead of a pale transverse band across the postclypeus,



Figs. 3-7. *Pomponia picta*, male, Sumatra, Mt Dempo. – 3, Body in dorsal view; 4, pygofer in ventral view; bpl basal pygofer lobe, cl clasper, lpl lateral pygofer lobe, ul uncus lobe; 5, clasper in ventrolateral view; 6, abdomen and operculum in ventrolateral view; 7, pygofer in ventrolateral view.

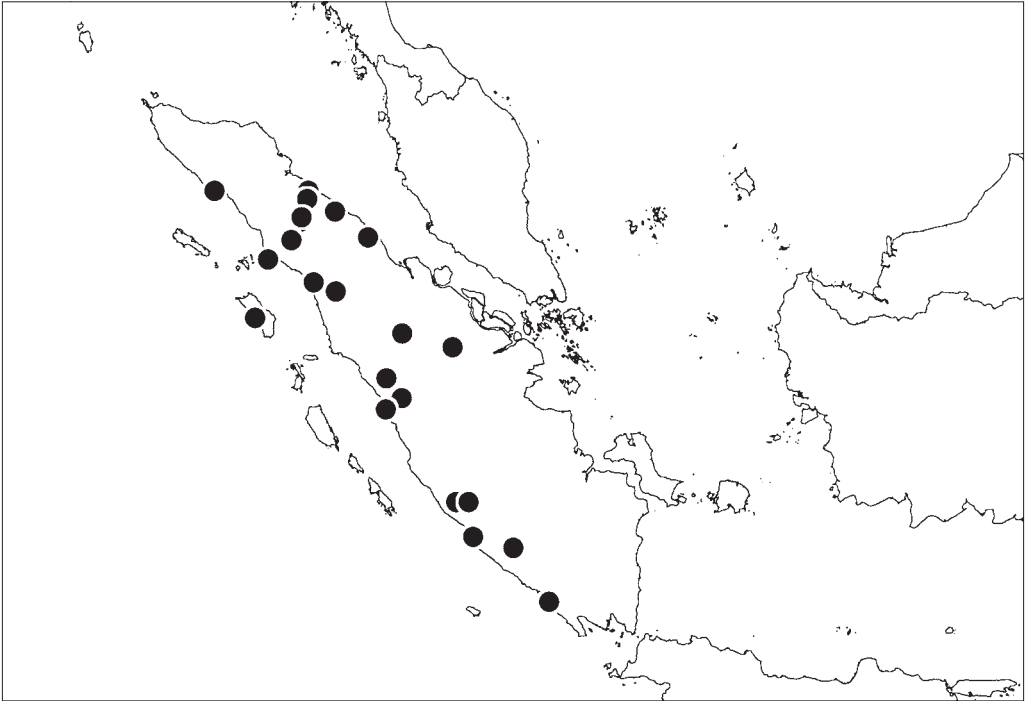


Fig. 8. Distribution of *Pomponia picta*.

(2) angular rounded, instead of sharply pointed, lateral pygofer lobes (fig. 4), (3) an uncus with two long lobes (fig. 4), instead of a trapezoid uncus with a median incision suggesting the fusion of two short, broad lobes, and (4) a triangular clasper with acute hook (figs. 5,7), instead of a clasper which is divided into two spines.

P. picta occurs on the island of Sumatra, Indonesia and on the island of Nias at the west coast of Sumatra (fig. 8). The single male specimen from Nias (body length 34.5 mm) is somewhat smaller than the specimens from Sumatra (body length 36-40.5). The large amount of material of *P. picta* (Walker) (= *P. fusca* (Olivier)) in museum collections suggests that *P. picta* is one of the most common cicada species in Sumatra. The male specimen from Flores (see material examined) belongs to *P. picta*, but this record from the Lesser Sunda group needs confirmation. An undescribed very close relative of *P. picta* is found in the Malayan Peninsula.

Description of male

Head and thorax with greenish yellow ground colour and reddish brown marking; both, spot enclosing ocelli and central fasciae on pronotum darker brown than other marking on head and thorax.

Head. Broad, 0.93-0.96 times as wide as pronotum and 1.06-1.11 times (n=7) as wide as mesonotum. Postclypeus slightly swollen. Supra-antennal plates with rounded anterior margins. Distance between lateral ocelli and eyes about twice as wide as distance between the two lateral ocelli. Dorsal side of head with brown median mark, enclosing ocelli and broadly connected with posterior margin of head. Anterior part of median mark forms an upside down triangle, with median ocellus in lower angle, reaching the frontoclypeal suture; brown colouration around lateral ocelli narrowly connected with supra-antennal plates. Lateral parts of head brownish. Antennae brown to ochraceous. Postclypeus with two median greenish yellow spots: an anterior oval spot which is open towards the frontoclypeal suture, and a ventral lanceolate spot; the spots are enclosed by the connected medial ends of two series of 8-9 transverse brown fasciae on either side; the spots are separated by a transverse brown line. Anteclypeus yellowish. Rostrum greenish yellow with black-brown apical part almost reaching hind margin of sternite 2. Genae and mandibular plates suffused brownish.

Thorax. Ground colour greenish yellow. Central fasciae on pronotum dark brown to black-brown, other marking on thorax reddish brown, or brown

to dark brown in poorly preserved specimens. Pronotum. Central fasciae usually continuous, but sometimes interrupted just below brown anterior pronotal margin, and widened anteriorly and somewhat narrowed at one-third of length from base; posterior ends crescent-shaped. Anterior two-thirds of space between central fasciae narrow, posterior one-third widened. Areas between anterior and posterior oblique fissures and between posterior oblique fissures and ambient fissure uniformly reddish brown. Anterolateral margin of pronotum collar with a small but distinct tooth. Posterolateral part of pronotum collar reddish brown. Mesonotum. Paramedian obconical marks reaching to half-length of mesonotum disk; lateral margins dark brown. Area between paramedian obconical spots light reddish brown. Pair of spots in front of anterior angles of cruciform elevation. Lateral obconical marks reaching from anterior to posterior margin of mesonotum.

Legs. Yellowish. Fore femora with basal and subapical, broad, brown rings, and a brown streak on upperside. Underside with two slightly adjacent spines, at one-third and at three-fourths of length from base, and a very small, triangular, subapical spine. Hind femora sometimes with brownish streak along apical one-third or one-fourth of posterior margin. Fore tibiae brown from one-third to five-sixths of length from base. Middle tibiae with light brown ring at one-sixth of length and with subapical one-third brown. Hind tibiae with basal one-sixth brown and with broad, subapical, brown ring. Tarsi of fore and middle legs brown, those of hind legs yellowish.

Tegmina and wings. Tegmina with connected, broad infuscation at bases of first and second apical areas and with a zigzag broad infuscation connecting the infuscate bases of third, fourth and fifth apical areas. Basal veins of sixth and seventh apical areas faintly infuscated. Crossings of nodal line with upper and lower branch of median vein, and basal vein of eighth apical area strongly infuscated. Apices of longitudinal veins with distinct dark brown infuscations. Venation in basal half of tegmen dark brown variegated with yellow, in apical half light brownish; venation of wings light brownish.

Operculum. Ochraceous, lateral margin brown. Broader than long, reaching to one-sixth of length of abdominal segment 3. Median margin fairly narrowly convex. Lateral margin sinuate at base and thereafter about straight and oblique to convex distal margin. Surface of operculum flat to very weakly convex.

Abdomen. Abdomen 1.3-1.5 times (n=7) as long as head and thorax together, slender, widest across timbal covers. Timbal covers with convex medial and anterior margins and with weakly convex, straight or weakly concave lateral margin. Middorsal surface of abdomen reddish brown, lateral sides light

brown, segments 3-6 with a pair of dark brown, oval spots. Timbal covers ochraceous, basal part brownish suffused.

Genitalia. Lateral pygofer lobes angular rounded. Basal pygofer lobes (fig. 4) narrow, long and pointed. Uncus bearing two long and narrow, more or less parallel lobes (fig. 4), which are weakly curved at one-third of length and more strongly curved at two-thirds of length. Claspers (figs. 4,5,7) triangular with acute hook.

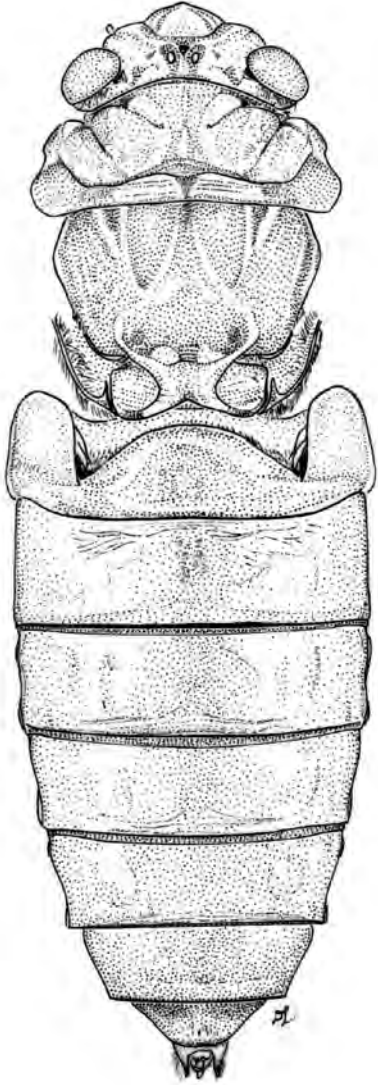
Measurements (n=7). Body length 36-40.5 mm; head width 10.2-11.1 mm; pronotum width 11.0-11.8 mm; mesonotum width 9.5-10.3 mm; tegmen length 42.5-45 mm.

Remarks

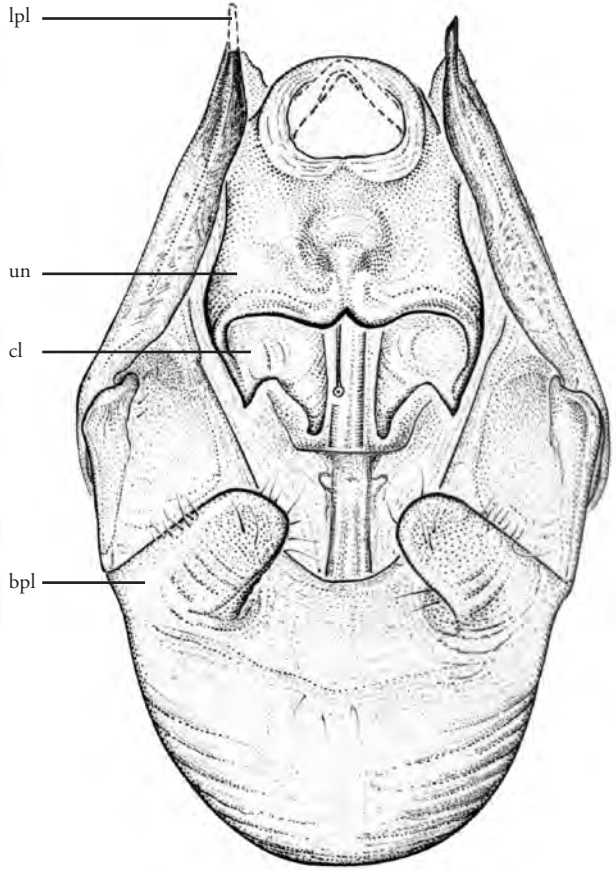
Dark coloured specimens have a very broad dark brown fascia running from ocelli to one-third of length of pronotum collar and much darker infuscations on the tegmina, while the midventral part of the postclypeus is dark brown with exception of the frontal medial spot.

Material examined. — 70♂. INDONESIA: SUMATRA: Airtjerjun, Kayuaro, Prop. Sumatra Barat, 25-26.v.1982, N. Nishikawa, 1♂ (SUU); W. Atjeh, Seumanjam, Menlabok, 30.xi.1953, R. Straatman leg., 30.xi.1953, 1♂ NHMW, same data but 5.ii.1954, 1♂ (RMNH), 3.iii.1954, 1♂ (RMNH); Brastagi, N. Sumatra, 5.xii.1989, T. Yasunaga, 1♂ (SUU); Karo Highland, Brastagi, North Sumatra, 26-31.iii.1976, S. Saito, 1♂, (SUU); Benkoelen, Tambang Sawah, 1929, E. Douglas, coll. Dr. D. Mac Gillavry, 1♂ (ZMAN); Benkoelen, Abdul Rachman, 1911, 2♂ (RMNH); Benkoelen Dist, 1912-1919, C.J. Brooks, 1920-43, 3♂ (BMNH); Deli, L. P. de Bussy, 4♂ (ZMAN); Deli, coll. Dr. D. Mac Gillavry, 2♂ (ZMAN); South Sumatra, Mt Dempo, 25.ix.1987, J.D. Weintraub, 1♂ (ZMAN); Fort de Kock, ii.1914, Edw. Jacobson, 1♂ (RMNH), same data but xi.1913, 1♂ (RMNH), vi.1914, 1♂ (RMNH); Fort de Kock, 920 m, v.1921, leg. E. Jacobson, *Pomponia picta* (Walker) ♂, J.C. Moulton, 20.viii.24, *Pomponia picta* (Walk.) ♂, det. W. E. China 1926, 1♂ (RMNH); Fort de Kock, 920 m, 1925, leg. E. Jacobson, *Pomponia picta* (Wlk) ♂ det. J.C. Moulton 1926, 1♂ (RMNH); Fort de Kock, 920 m, 1924, leg. E. Jacobson, *Pomponia picta* (Wlk) ♂ det. J.C. Moulton 1926, 1♂ (MNP); Fort de Kock, 920 m, 1926, leg. E. Jacobson, *Pomponia picta* Walk. ♂, det. W.E. China 1926, 1♂ (RMNH); Fort de Kock, 1000 m, vi.1930, 1♂ (ZMAN); Fort de Kock, 1000 m, xii.1930, J. Kool leg., 1♂ (ZMAN); Kaban Djahé, Oostkust van [East Coast of] Sumatra, 14.iii.1929, verz. [coll.] H. v. d. Vaart, 1♂ (RMNH); Mt. Kerintji, Aro Estate, Au Kayo, 1-5.iii.1954, A. G. Alston, B.M. 1954-414, C.J. Brooks, B.M.1936-681, 1♂ (BMNH); North Korintji Valley, 5000 ft, ix-x.1926, coll. Dr. D. Mac Gillavry, *Pomponia fusca* ♂ det. McGill[avry], 1♂ (ZMAN); Sumatra, S.E. coast, Laut Tador, 90 m, 4.iv.1951, R. Straatman leg., 1♂ (RMNH); W. Sumatra, Lebong Tandai, 1912, C.J. Brooks coll., C.J. Brooks, B.M. 1936-681, 1♂ (BMNH); W. Sumatra, Lebong Tandai, xi.1922, C.J. Brooks coll. No. 9327, C.J. Brooks B.M. 1936-681, *Pomponia picta* Wlk. (Moulton's handwriting), 1♂ (BMNH); W. Sumatra,

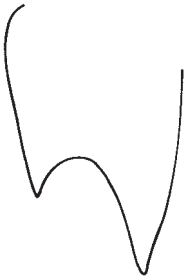
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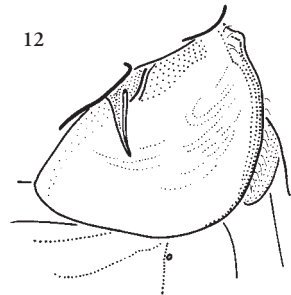
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12



Figs. 9-12. *Pomponia linearis*, male. – 9, Body in dorsal view, Assam, Shillong; 10, pygofer in ventral view; bpl basal pygofer lobe, cl clasper, lpl lateral pygofer lobe, un uncus; holotype; 11, clasper in ventrolateral view, Assam, Shillong; 12, operculum in ventrolateral view, Assam, Shillong.

Lebong Tandai, 1921, C.J. Brooks B.M. 1936-681, *Pomponia picta* Wlk. (Moulton's handwriting), 2♂ (BMNH); W. Sumatra, Lebong Tandai, 1920-1923, C.J. Brooks B.M. 1936-681, 5♂ (BMNH); W. Sumatra, Lebong Tandai, 27.xii.1922 C.J. Brooks coll., No. 5292, C.J. Brooks, B.M. 1936-681, 1♂ (BMNH); Medan, 1909, van Loghem, 1♂ (BMNH); Sumatra's O.K. [East Coast], Medan, 20 m, 10.i.1921, J.B. Corporaal, 1♂ (ZMAN); Medan, de Bussy, coll. Dr. D. Mac Gillavry, *Pomponia picta* Walk. ♂ det. McGillavry], 1♂ (ZMAN); Sum. O., Padang (eiland aan de oostkust [= island at the east coast]), Bedagal, A. v.d. Goot. 1♂ (ZMAN); Sumatra, Padang, J.G. Myers coll, B.M. 1937-789, *Pomponia* (Wk.) *picta* cf. type J. M., 1♂ (BMNH); Sumatra W.K. [West Coast], Padang, 17.xi.1949, J.M.A. v. Groenendael, 1♂ (ZMAN), same data but 15.ii.1932, 1♂ (ZMAN); Sungai Penuh, ix.1915, Edw Jacobson, 1♂ (RMNH); North Sumatra, near Prapat, 2°45'52N/99°58'20, 4.iii.2002, T. Kothe, 1♂ (zsm); Ris Tapanoeli, Singkel, A.L. v. Hasselt, acq 1894, 1♂ (RMNH); North Sumatra, Hotel oberhalb Sibolga, 1°46'02N/98°47'57, 17.ii.2002, T. Kothe, 2♂ (zsm); North Sumatra, Sidikalang, 1250 m, 2°41'55 N/98°18'18 E, 1-2.xii.2000, U. Buchsbaum, 4♂ (zsm); Sidikalang, 1250 m, 2°41'51 N/98°18'18 E, 15-16.ii.2002, T. Kothe, 4♂ (zsm); North Sumatra, near Sipirok, 01°34'04 N/99°16'59 E, 9.ii.1997, U. Buchsbaum, 1♂ (zsm); Solok, P. O. Stolz, 26.ii.1912, 2♂ (RMNH); Solok, Pad. Bovenl., 1908, P.O. Stolz, 2♂ (RMNH); Solok, Pad. Bovenl., P.O. Stolz, ontv. [received] 27.ii.1911, 1♂ (RMNH); Tambang Sawah (Benkulen), xi.1922, leg. Walke, 1♂ (BMNH); Sum[atra], Tanangtalu, v.1915, Edw. Jacobson, 1♂, (RMNH); Sumatra's Westkust [West Coast], 1922-23, 1♂ (RMNH); Sumatra's O.K. [East Coast], Mej. Scheffer, don. 1930, 1♂ (ZMAN). NIAS: Noord [=North] Nias, G. Mandjeja, xi-xii.1893, Mitschke, 1♂ (BMNH). FLORES: Pagal, 12.ii.1950, J.M.A. van Groenendael, 1♂ (ZMAN).

Pomponia linearis (Walker)
(figs. 2, 9-13)

Cicada linearis Walker, 1850: 48. ♂ holotype: '8. Dundubia linearis, Mas', '445', '= cinctimanus & ramifera Stol [sic]', (BMNH).

Pomponia linearis, Hayashi, 1978: 174, fig. 16A (Central Nepal)

Pomponia linearis partim; Metcalf, 1963: 845-849; Duffels & Van der Laan, 1985: 176-177.

Since *Pomponia linearis* has been used as a 'blanket name' for a number of distinct species, we refer only to the literature relevant for the discussion in this paper and to the catalogues of cicada literature.

A number of described and undescribed species related to *P. linearis* have been studied to establish the identity of *P. linearis*. Comparison and grouping of these species lead to the recognition of the *P. linearis* group, and the *P. linearis* complex within the *P. linearis* group. This grouping will be discussed in the next paragraph to provide a taxonomic framework for the description of *P. linearis*. We have refrained from proposing a new genus group name for *P. linearis* and its relatives.

The *Pomponia linearis* species group and the *P. linearis* species complex

The name *Pomponia linearis* group is proposed here for the *Pomponia* species with the following characters: a broad pale transverse band across the postclypeus, acute lateral pygofer lobes, a trapezoid uncus with medial incision suggesting the fusion of two short, broad lobes, and a pair of claspers, each with two spines, protruding from below the uncus. On account of these characters, the following species belong to the *Pomponia linearis* group: *P. linearis* from Assam, Bhutan, Nepal, Thailand and Vietnam, *P. cinctimanus* (Walker, 1850) comb. nov. from Sylhet, *P. dolosa* Boulard, 2001 from Thailand, *P. fuscooides* Boulard, 2002 from Thailand, *P. langkawiensis* Zaidi & Azman, 1999 from Langkawi Island, Malaysia, *P. ramifera* (Walker, 1850) comb. nov. from Sylhet, *P. urania* (Walker, 1850) comb. nov. from 'E. Ind' [East India or East Indies?] and *P. zakrii* Zaidi & Azman, 1998 from the Malayan Peninsula. *P. cyanea* Fraser, 1948 from India is related to the *P. linearis* group. It has pygofer lobes and an uncus as described for the *P. linearis* group but the claspers are broad and rounded and the postclypeus is missing the pale transverse band. The other species of *Pomponia* have a different postclypeal marking, rounded pygofer lobes and distinctly separated uncus lobes

The list above contains the new combinations *Pomponia cinctimanus* (Walker, 1850), *P. ramifera* (Walker, 1850) and *P. urania* (Walker, 1850) since study of their types (all males) in the collection of the BMNH proved that these species are not synonymous to *P. linearis*. *Dundubia cinctimanus* and *D. ramifera* were synonymized with *D. linearis* ever since 1862 (Stål, 1862), while *P. urania* was synonym of *D. linearis* since 1890 (Distant, 1890). The three species can be distinguished from *P. linearis* by a distinctly smaller body size, by the third marginal spot on the tegmen which is not longer than the other marginal spots, and by the shape of the male uncus. Further study of these three species is needed to establish their identity.

Within the *linearis* group we have distinguished the *linearis* species complex. The species belonging to this complex are: *P. linearis*, *P. cinctimanus*, *P. dolosa*, *P. ramifera*, and *P. urania*. Distinctly protruding paramedian basal pygofer lobes characterize the species complex. The figures of the male genitalia of *P. fuscooides* (Boulard, 2002) are insufficient to decide whether this species belongs to the *linearis* species complex or not. In the other species of the *linearis* group, not belonging to the *linearis* complex, *P. langkawiensis* and *P. zakrii*, the basal pygofer lobes are placed laterally adjacent to the sides of the pygofer.

P. linearis is a large species (expansion of tegmina

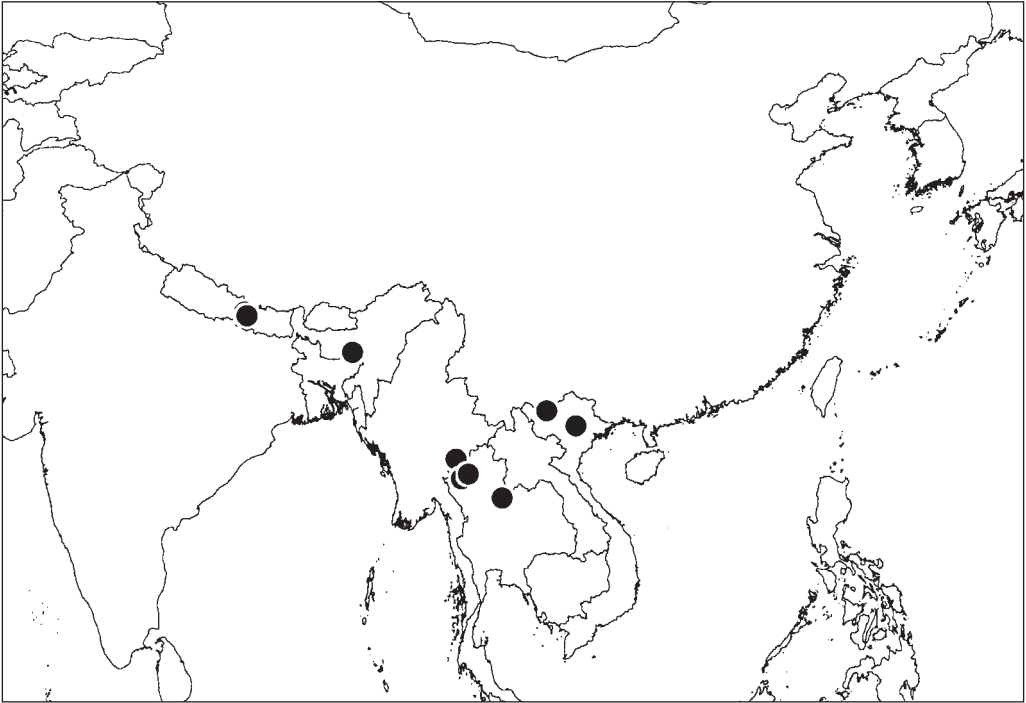


Fig. 13. Distribution of *Pomponia linearis*.

109-122 mm) with a narrow, triangular head, a swollen postclypeus, a brownish marked head and thorax, and a long and slightly swollen male abdomen (figs. 2, 9). *P. linearis* can be separated from the other species of the *linearis* complex by the medial spine of the clasper (figs. 10, 12), which is straight and distinctly longer than the lateral spine of the clasper; in the other species of this complex the median spine is often slightly curved, and only slightly longer, as long as, or shorter than the lateral spine. All species of the *linearis* species complex have large, paramedian, basal pygofer lobes, but these are oblique in *P. linearis* (fig. 10) and more or less parallel in the other species. The basis of the eighth apical area of the tegmen and the crossings of the nodal line with the upper and lower branch of the medial vein are infuscated in *P. linearis* (fig. 2), but only very lightly brownish or unspotted in other species of the species complex. *P. linearis* is recorded here from Assam, Bhutan, Nepal, Thailand, and Vietnam (fig. 13).

Description of male

Head. Triangular, 0.73-0.82 times (n=7) as wide as pronotum and (0.85) 0.90-0.95 times (n=7) as wide as mesonotum. Postclypeus swollen. Supra-

antennal plate with rounded, slightly angular protruding, anterior margin. Distance between lateral ocelli and eyes about twice as wide as distance between lateral ocelli. Dorsal side of head with more or less distinct brown to dark brown median mark enclosing ocelli, and broad brown to dark brown fascia along posterior margin of head. Anterior part of median mark forms an upside down triangle, with median ocellus in lower angle, reaching the frontoclypeal suture, and with lateral angles narrowly extending to supra-antennal plates. Posterior part of median mark enclosing lateral ocelli and reaching to posterior margin of head. Lateral parts of head and supra-antennal plates brownish ochraceous. Remaining surface of vertex, between central brown mark and lateral brownish colouration, greenish yellow with a pair of small drop-shaped spots just below level of paired ocelli. Antennae dark brown. Postclypeus ochraceous with pale transverse band, which is about twice as high as the brown lower part of postclypeus at clypeal suture. Anteclypeus yellowish. Rostrum yellow with black-brown tip almost reaching hind margin of sternite 2. Genae with brown to black fasciae from base of antenna to eye. Lower two-thirds of mandibular plate suffused brownish.

Thorax. Ground colour yellowish, pronotum collar with greenish tinge, 80-90% of dorsal surface of thorax covered with brown or sometimes dark brown marking. Pronotum. Central fasciae brown to dark brown, narrowest at one-third of length from base, gradually widened distad to dark brown anterior pronotal margin, and strongly widened proximad to ambient fissure of pronotum; proximal ends of both central fasciae fused in a dark brown median triangle on pronotum collar. A pair of narrow dark brown stripes above, and another pair below, proximal parts of anterior oblique fissures. Two pairs of large, uniformly brown, marks enclosed respectively by anterior and posterior oblique fissures and by posterior oblique fissures and ambient fissure. Pronotum collar with a curved, dark brown bands along anterior margins of these large brown pronotal marks. Anterolateral margin of pronotum collar with obtuse tooth. A narrow brown fascia along anterolateral margin ends in a large, brown to dark, brown spot on posterolateral part of pronotum collar; spot about as long as wide and enclosed between margin of pronotum collar and ambient fissure. Pronotum collar with another pair of triangular spots attached to ambient fissure in front of lateral mesonotal marking. Mesonotum. Median fascia brown, narrowest at anterior mesonotal margin and strongly widened to a triangular mark on anterior half of mesonotum. Paramedian, obconical marks with narrow, brown, median margins and much broader, dark brown, lobate lateral margins, and reaching to three-fifths of mesonotum length; center of obconical marks yellowish. Short part of median fascia, posterior to triangular mark, about 5-6 times as wide as anterior width of fascia. Middistal part of mesonotum in front of cruciform elevation with a pair of fused, strongly enlarged, round, brown to dark brown marks. A pair of very narrow two-tipped brown stripes, between obconical marks and lateral fasciae, reach from anterior mesonotal margin to one-third or one-fourth of mesonotum length. Lateral fasciae very broad, brown to dark brown, reaching from anterior to posterior mesonotal margin. Brown colouring of median triangular mark more or less diffusely connected with mediiodistal mark, distal part of obconical marks and middle of lateral fasciae. Yellowish ground colour most conspicuous between median fascia and obconical marks, at both sides of the triangular stripes, laterally of lateral fasciae, between mediiodistal mark and lateral fasciae, and on anterior arms of cruciform elevation.

Legs. Yellowish. Fore femora with subapical, ochraceous to dark brown mark on outer side and with light brownish streaks on upperside. Underside with three spines: a slightly adjacent, conical spine at one-third of length from base, a flat, triangular spine at three-fourths of length and a subapical, small, conical

spine. Hind femora with brownish streak on apical half or one-third of posterior side. Fore tibiae brownish. Middle tibiae with a brown ring at one-sixth of length from base and with brown subapical one-third. Hind tibiae with basal one-sixth brown and subapical brown ring. Tarsi of fore and middle legs brown, tarsi of hind legs yellowish.

Tegmina and wings. Tegmina with a distinct infuscation at base of second apical area and with another infuscation connecting the infuscate bases of third, fourth and fifth apical areas. Basal vein of sixth and seventh apical areas faintly infuscated. Crossings of nodal line with upper and lower branch of median vein, and basal vein of eighth apical area lightly infuscated. Apices of longitudinal veins of apical areas with brown infuscations; third infuscation twice as long as other marginal infuscations. Venation in basal half of tegmen dark brown variegated with yellow, in apical half light brownish; venation of wings pale brown.

Operculum. Greenish ochraceous, rim brown to dark brown from one fourth of lateral margin to about half-length of distal margin. Broader than long, reaching just beyond hind margin of abdominal segment 2. Medial margin narrowly convex. Lateral margin weakly sinuate at base and further evenly and fairly strongly convex to distal margin, which is weakly convex. Medial one-third of surface flat, lateral part convex.

Abdomen. Abdomen 1.45-1.6 times (n=7) as long as head and thorax together, fairly broad, widest at hind margin of segment 3. Timbal cover with weakly concave lateral margin, weakly convex medial margin, and strongly convex anterior margin. Dorsal surface light castaneous, timbal cover ochraceous, posterior part of segment 7 and whole segment 8 often uniformly dark brown; posterior rims of all tergites dark brown. Ventral surface uniformly light brown.

Genitalia. Lateral pygofer lobes sharply pointed. Basal pygofer lobes (fig. 10) large and oblique. Uncus (fig. 10) trapezoid with a narrow and short, median incision suggesting the fusion of two short, broad lobes. Claspers (figs. 10, 11) with two spines protruding from below the uncus; medial spine straight and distinctly longer than lateral spine.

Measurements (n=7). Body length 44-49.5 mm; head width 10.1-11.1 mm; pronotum width 12.7-13.8 mm; mesonotum width 10.5-11.8 mm; tegmen length 50-56 mm.

Material examined. 16♂. INDIA: ASSAM: Shillong, Morendro Doonai, 12.iii.1936, 7♂ (RMNH); Shillong, Khasi Hills, H.M. Parish, B.M.1923-247, 1♂ (BMNH). BHUTAN: Bhoutan, Anglais, R. Oberthür, 1900, 1♂ (MNP). NEPAL: Godavari, 9.vi.1963, 1♂ (SUU); Kakani, 27°49'N 85°15'E, 2070 m, 18.vi.1995, T.W. Harman, 4♂ (ZMAN), same data but 6.vii.1995, 1♂ (ZMAN). THAILAND: Ban Angkhai, Samong Dist., Chiang Mai, 15-20.v.1998,

K. Matsumoto, 1♂ (SUU); Doi Inthanon, Bang Khun Klang, 98° 32'E 18° 32' N, 27.iv-1.v.1989, Chantaramongkol & Malicky, 1♂ (tzuI); Prov. Mae Hong Son, NW Soppong, NW Mae La Na, 19°39'24" N 98°14'22", 1100 m (24/2000), 23.iv.2000, Lichtfang, H. & U. Aspöck, 1♂ (NHMW); Thaïlande (Loei), Na Haeo (bio. station), 05-12.v.2001, Constant & Grootaert, 1♂ (KBIN); Sapping, Pai Dist., Mae Hon Song, 18.v.2000, K. Masumoto, 1♂ (SUU); NW Thailand, Sopping Pai, 1800 m, 25.iv-5.v.1992, leg. P. Pecholatko, 2♂ (NHMW). VIETNAM: Tam Dao, N. Vietnam, 27.vii-2.viii.1992, N. Ohbayashi, 1♂ (SUU); Indo-China, Tonkin, Chapa, R. V. de Salvaza, 1917-98, 1♂ (BMNH).

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