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## Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel

### Homoptera: Fam. Cicadidae

By Masami Hayashi

**Abstract:** Ten species of the Cicadidae are recorded from Bhutan; all of them are new to the country. They are *Platypleura assamensis* Atkinson, *Pycna repanda* (Linné), *Gaeana festiva* (Fabricius), *G. sulphurea* (Westwood), *Balinta octonotata* (Westwood), *Pomponia surya* Distant, *Terpnosia andersoni* Distant, *Euterpnosia madhava* (Distant) (comb. nov.), *Oncotympana obnubila* (Distant) and *Platylomia saturata* (Walker). Most of the specimens examined were collected by the Bhutan-Expedition 1972 of the Naturhistorisches Museum in Basel. Additional descriptions and notes are given on some of the species.

Through the courtesy of Dr. Walter Wittmer, I was given an opportunity to examine the Cicadidae collected by the Bhutan-Expedition 1972 of the Naturhistorisches Museum in Basel.

Though there are many reports on the cicadid-fauna of India and the Himalayas (Sikkim and Nepal), Bhutanese forms have been so poorly known up to the present that we cannot grasp the peculiarity of the fauna. From the zoogeographic point of view, however, it is very important to study the Cicadidae of this country which is surrounded by Assam, Sikkim and China (Tibet).

DISTANT (1906) recorded two species from Bhutan, *Cryptotympana acuta* (Signoret) and *Graptotettix guttatus* Stål, the former of which, common in (and probably restricted to) Java, Indonesia, was first reported by ATKINSON (1884, p.230: "78. *Cryptotympana vicina* (= *acuta*) ... The Indian Museum possesses specimens from the Bhutan Duárs."), but is dubious to occur in Bhutan. Later, DISTANT added the following four species to the fauna of Bhutan: *Tanna bhutanensis* (1912a), *Platylomia insignis* (1912b), *Mata rama* (1912b) and *Terpnosia oberthuri* (1912b). Many more species of Cicadidae have been recorded from Sikkim, Assam, Darjeeling, Himalayas, etc. (WESTWOOD, 1845a, b; DISTANT, 1906 and 1916; ASHTON, 1914; OLLENBACH, 1929; MATHUR, 1953; etc.), but none of them is known to occur in the territory of Bhutan.

In this paper, I am going to record ten species of Cicadidae from Bhutan and to make some remarks on them.

Before going further, I would like to express my deep gratitude to Dr. Walter Wittmer of the Naturhistorisches Museum in Basel (NMB) and Dr. Yoshihiko Kurosawa of the National Science Museum (Nat. Hist.), Tokyo (NSMT), for their kind permission to examine the specimens. My hearty thanks are due to Professor Syôiti Miyamoto of the Junior College of Chikushi Jogakuen and Dr. Shun-Ichi Uéno of the National Science Museum (Nat. Hist.), Tokyo, for critically reading the manuscript.

### ***Platypleura assamensis* Atkinson, 1884**

*Platypleura assamensis* ATKINSON, 1884, J. Asiat. Soc. Bengal, 53: 212.

*Platypleura repanda* Linné var. *assamensis*: DISTANT, 1889, Mon. Orient. Cicad., p. 20.

*Platypleura assamensis*: DISTANT, 1906, Faun. Brit. Ind., Rhynch., 3: 70.

Specimen examined: 1 ♂, Phuntsholing (200–400 m), SW Bhutan, 2.IV.1966, H. Hara leg. (NSMT).

Originally described from Assam (Sibságar and Nága Hills), India, and new to Bhutan.

### ***Pycna repanda* (Linné, 1758)**

*Cicada repanda* LINNÉ, 1758, Syst. Nat., 1: 436.

*Tettigonia repanda*: FABRICIUS, 1781, Ryng., 2: 267.

*Fidicina? repanda*: WALKER, 1850, List Hom. Brit. Mus., 1: 90.

*Oxypleura repanda*: DOHRN, 1859, Cat. Hem., Hom., 1859: 72.

*Platypleura repanda*: SIGNORET, 1881, Bull. Soc. ent. Fr., (6), 1: xlii.

*Pycna repanda*: DISTANT, 1906, Faun. Brit. Ind., Rhynch., 3: 71.

*Platypleura phalaenoides* WALKER, 1850, List Hom. Brit. Mus., 1: 4.

*Platypleura interna* WALKER, 1852, *ibid.*, Suppl., 4: 1119.

*Platypleura congrex* BUTLER, 1874, Cist. Ent., 1: 186.

Specimen examined: 1 ♀, Paro (2300 m), W Bhutan, 16.X.1968, K. Ogata leg. (private collection of M. Hayashi).

Widely distributed in India, Burma and the Himalayas (Sikkim and Nepal), and new to Bhutan. The male genitalia of this species are described by HAYASHI (in press).

### ***Gaeana festiva* (Fabricius, 1803)**

*Tettigonia festiva* (sic) FABRICIUS, 1803, Syst. Rhynch., p. 41.

*Cicada festiva* GERMAR, 1830, Arch. Thon's Ent., 2(2): 38.

*Gaeana festiva*: STÅL, 1866, Berl. ent. Z., 10: 170.

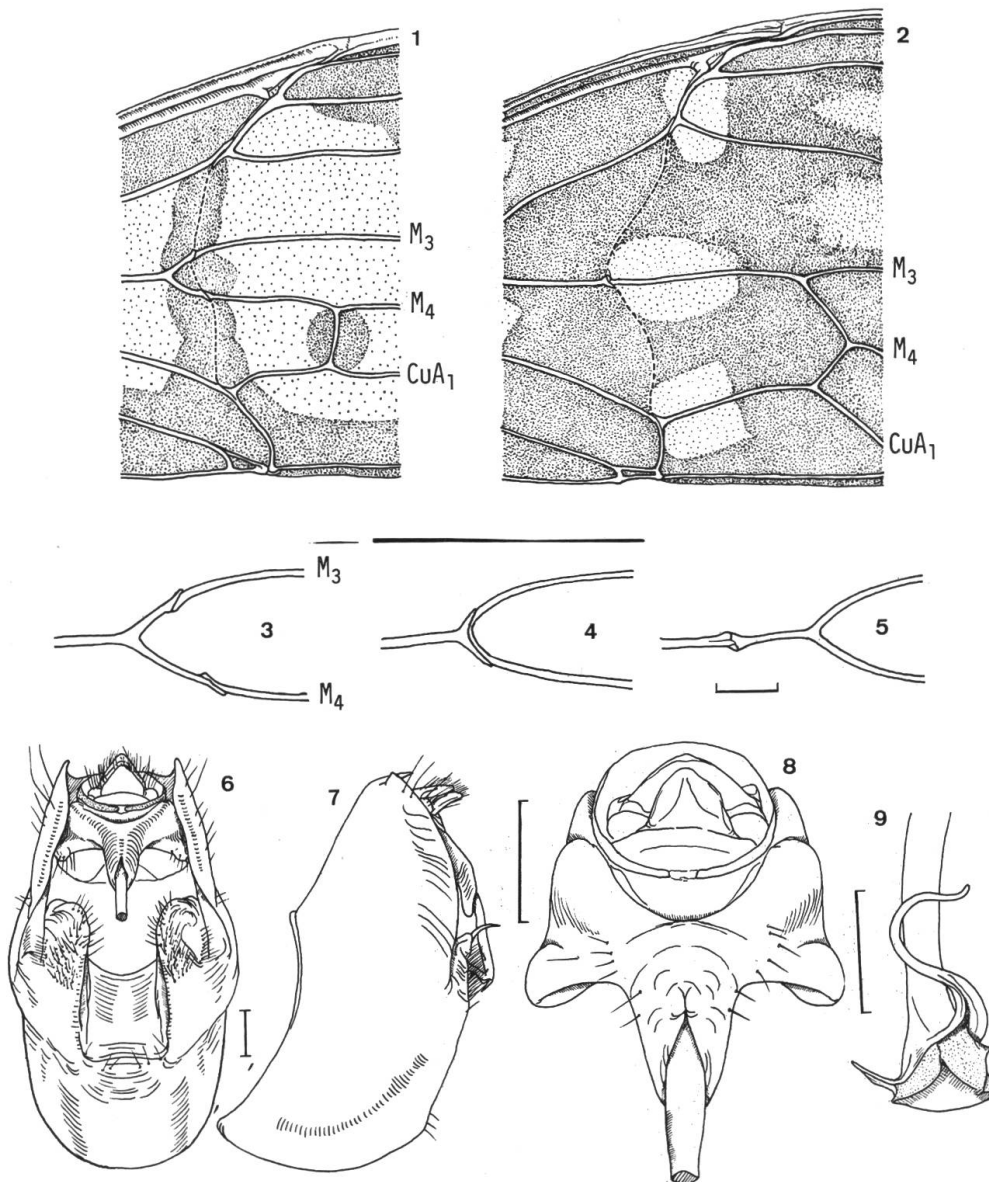
*Cicada thalassina* PERCHERON, 1838, Gen. Ins., Hom., p. 4.

*Cicada percheronii* GUÉRIN-MÉNEVILLE, 1844, Icon. Règne Anim. G. Cuvier, Ins., p. 355.

*Gaeana consobrina* WALKER, 1850, List Hom. Brit. Mus., 1: 119.

Specimens examined: 4 ♂♂ 4 ♀♀, Thimphu River (2300 m), W Bhutan, 29.IV.1972 (NMB).

Within the genus *Gaeana*, this species is peculiar in that the cell  $M_3$  of the forewing, the 6th apical cell is so long, about twice as long as the others, that the nodal line crosses on the base of the cell (in some specimens, the nodal line runs across the apical portion of the stalk of  $M_3$  and  $M_4$ ) (Figs. 1–5). This character is recognized also in *G. annamensis* Distant from Laos.



Figs. 1–5. Central part of right forewing. 1: *Gaeana festiva* (Fabricius) — 2: *G. maculata* (Drury) from Hong Kong. Nodal line is indicated by broken line. 3–5. Individual variation appearing in the nodal portion on a media of forewing of *G. festiva*. Scale, 1 mm. Figs. 6–9. Male genitalia of *Gaeana festiva*. 6, 7: pygofer in ventral and lateral views — 8: uncus — 9: tip of theca. Scales, 0.5 mm.

Male genitalia (Figs. 6–9): Pygofer barrel-shaped, widened near the middle in ventral view; ventral processes of pygofer very wide; uncus very wide at base, and the lobe (two lobes completely fused into one) narrow; vesica with a short and a long curled sclerotized processes; endotheca with two short membraneous pouches.

The ovipositor (sheath) does not extend beyond the 9th abdominal segment; it extends far beyond this segment in *G. maculata* (Drury), *G. sulphurea* (Westwood), etc.

This species is widely distributed in Southeast Asia and has been recorded also from Sikkim, Assam and N. Bengal (Rilli Forest, 3500 ft), but it is new to Bhutan. Specimens from the Malay Peninsula (West Malaysia), which were collected from the lowland, show different color-pattern and markings on the forewing. These are probably within the geographic variation of *festiva*.

#### ***Gaeana sulphurea* (Westwood, 1839)**

*Cicada sulphurea* WESTWOOD, 1839, Ent. Himalaya and Ind., 1: liv.

*Gaeana sulphurea*: WHITE, 1846, Ann. Mag. nat. Hist., (1), 17: 332.

*Cicada pulchella* WESTWOOD, 1839, Illust. nat. Hist. Himalaya, 2, Pl. 10.

Specimens examined: 1 ♂ (pygofer only) 2 ♀ ♀, Bhutan, 3.V.1966, Botanical Expedition by Tokyo University (NSMT).

The male genitalia are described by HAYASHI (in press). This species has been recorded from India (Assam, Bengal, Uttar Pradesh, etc.) and the Himalayas (Sikkim and Nepal), and is new to Bhutan.

#### ***Balanta octonotata* (Westwood, 1845)**

*Cicada 8-notata* WESTWOOD, 1845, Hom. East Ind., 2: 34.

*Huechys octonotata*: WHITE, 1846, Ann. Mag. nat. Hist., (1), 17: 332.

*Gaeana octonotata*: ATKINSON, 1884, J. Asiat. Soc. Bengal, 53: 221.

*Balanta octonotata*: DISTANT, 1905, Ann. Mag. nat. Hist., (7), 15: 383.

*Huechys picta* WALKER, 1858, Ins. saundersiana, Hom., 1858: 28.

Specimens examined: 6 ♂ ♂ 3 ♀ ♀, Samchi (300 m), SW. Bhutan, 7–11.V.1972 (NMB).

The ivory-white spots on the forewing are variable in shape and number according to the individual. The male genitalia are described and illustrated by HAYASHI (in press), but the description was based only upon the ventral view of the apical portion of the pygofer and uncus. In this paper, a more detailed description is prepared: pygofer large in proportion to body-size; a central dorsal beak of pygofer long and acute; uncus (lobe) hairy, gently curved inwards; uncus lobe relatively flat; theca stout with 3 short projections at apex (Figs. 10–11).

The ovipositor (sheath) extends a little beyond the 9th abdominal segment, which has the shape of a narrow triangle.

This species has been known from India (Assam), Sikkim, Burma, Nepal (HAYASHI, in press) and Java (?), and is new to Bhutan. Most of the known localities are low in altitude; ASHTON (1914) recorded it from rather a low place (Singla, 1500 ft in alt.) in the Darjeeling District, India.

### ***Pomponia surya* Distant, 1904**

*Pomponia surya* DISTANT, 1904, Trans. R. ent. Soc. Lond., 1904: 671.

Specimen examined: 1 ♂, Wangdi Phodrang (1300 m), C Bhutan, 7.VI.1972 (NMB).

The fuscous spots on the forewing are developed in this specimen, appearing on all cross veins and on the apical part of every longitudinal vein, the latter of which forms a marginal series of fuscous spots. According to DISTANT's original description, the fuscous spots on the forewing appear on the 1st and 2nd cross veins (veins  $R_{2+3}$ – $R_{4+5}$  and  $R_{4+5}$ – $M_1$ ) and faintly on the 1st to 3rd longitudinal veins near the margin of the wing. The ♂ opercula are mutually very close at the inner margins, as was illustrated by DISTANT (1904).

Male genitalia (Figs. 12–13): Very similar to those of *P. sp.* (HAYASHI, in press) from Nepal; central dorsal beak of pygofer much shorter; ventral base of uncus spherically convex; uncus lobes longer, with oblique and rounded apices, and roundly and inwardly curved in lateral view; theca comparatively thick, much projected beyond uncus.

This species was originally recorded from Mussoree, Uttar Pradesh, and is new to Bhutan. Only these two localities are known up to now.

### ***Terpnosia andersoni* Distant, 1892**

*Terpnosia andersoni* DISTANT, 1892, Mon. Orient. Cicad., p. 141.

Specimen examined: 1 ♂, Bhutan, 28.V.1966, Botanical Expedition by Tokyo University (NSMT).

The male genitalia of this species were described and illustrated by HAYASHI (in press).

This species is known from China (Yunnan and Kiangsu), India, Sikkim, Burma and Nepal (central and eastern parts), and is now added to the fauna of Bhutan for the first time. In Nepal, this cicada seems to be very common in montanous areas (1300–2700 m in alt.) (cf. NARUSE, 1973; HAYASHI, in press).

***Euterpnosia madhava* (Distant, 1881), comb. nov.**

*Pomponia madhava* DISTANT, 1881, Trans. R. ent. Soc. Lond., 1881: 644.

*Terpnosia madhava*: DISTANT, 1892, Mon. Orient. Cicad., p. 141.

Specimens examined: 5 ♂♂ 3 ♀♀, 21 km E from Wangdi Phodrang. (1700–2000 m), C. Bhutan, 15.VI.1972 (NMB); 1 ♂, Bhutan, 8.V.1966, Botanical Expedition by Tokyo University (NSMT).

This species is closely allied to *E. crowfooti* (DISTANT, 1912) from North India (Bengal), Nepal, etc., and is distinguished from the latter by the following points: Body uniformly pale green without any black or fuscous spot and marking; forewing relatively wide, ratio of the length to width about 3.04–3.20, average 3.13 (in *crowfooti*, the ratio is about 3.15–3.57, average 3.29); ♀ abdomen conical in shape; ovipositor (sheath) extending beyond 9th abdominal segment, as long as the segment in dorsal median length (more or less shorter in *crowfooti*). The presence of a pair of scale-like protuberances at the sides of the ♂ 4th abdominal segment leads this species to the genus *Euterpnosia* MATSUMURA (1917).

Male genitalia (Figs. 14–16): Resembling those of *crowfooti* (Fig. 16 c) (cf. HAYASHI, in press); pygofer much more widened near the middle; in lateral view, anus more projected beyond the pygofer; a small projection on the ventral lobe of the pygofer situated more basally and a little projected ventrally; uncus lobe closely similar in size and shape to that of *crowfooti*.

This species has been recorded from India (Assam) and Indo-China, and is now recorded from Bhutan for the first time.

***Oncotympana obnubila* (Distant, 1888)**

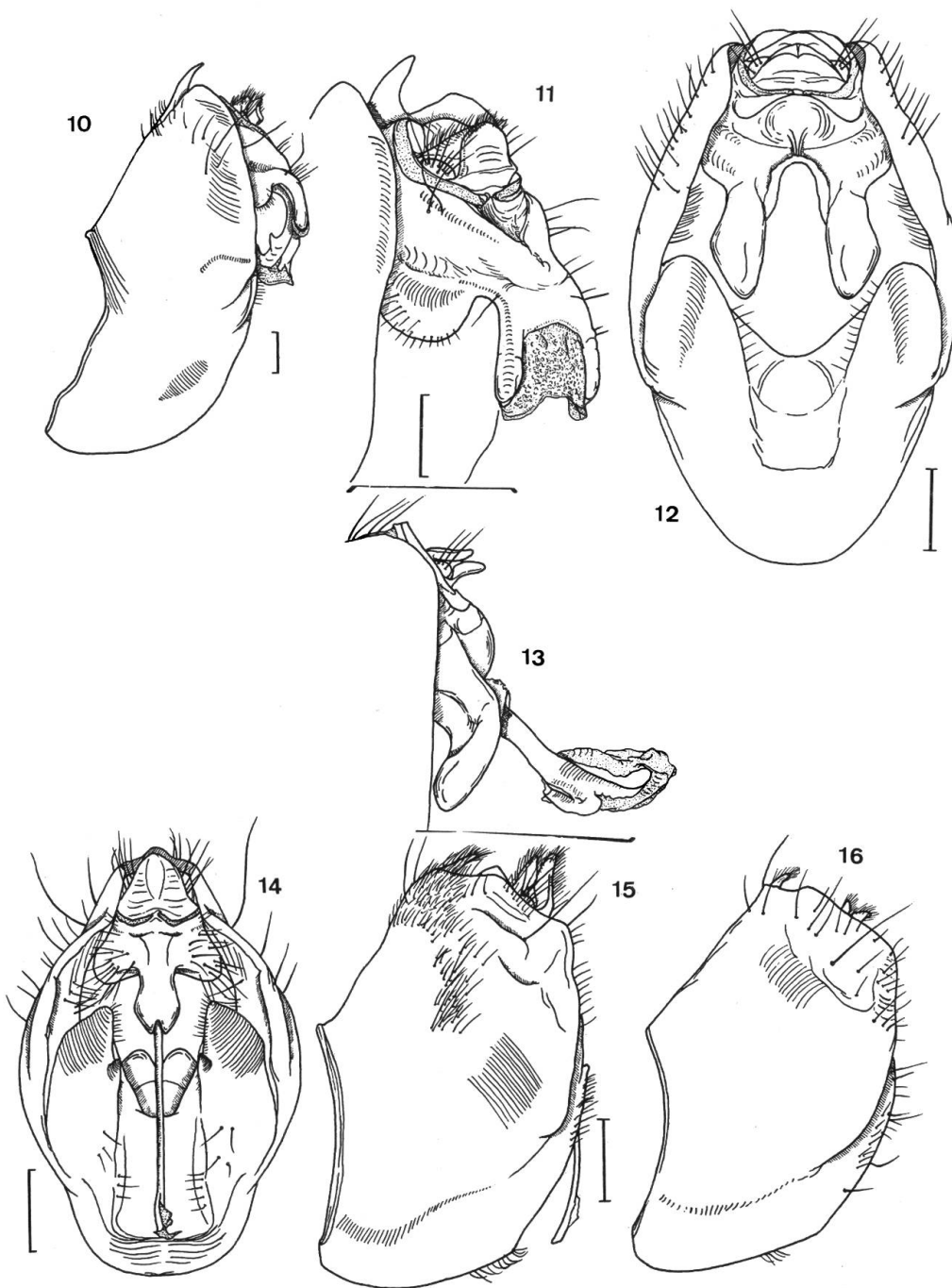
*Pomponia obnubila* DISTANT, 1888, Ann. Mag. nat. Hist., (6), 1: 296.

*Oncotympana obnubila*: DISTANT, 1906, Faun. Brit. Ind., Rhynch., 3: 117.

Specimens examined: 1 ♀ 1 ♂, Thimphu (2300–2500 m), W Bhutan, 25.V.–5.VI.1972 (NMB); 1 ♀, *ibid.*, 26.–29.VI.1972 (NMB).

The male genitalia are described and illustrated by HAYASHI (in press); no geographic variations have been observed between the Nepalese and Bhutanese specimens.

This hairy cicada was known from India, Simla, Punjab (DISTANT, 1888) and Tehri Garhwal District, Uttar Pradesh (DISTANT, 1906), and from Nepal, eastern and central parts (HAYASHI, in press). It is now recorded from Bhutan for the first time. All the known localities are high in altitude.



Figs. 10–11. Male genitalia of *Balinta octonotata* (Westwood). Pygofer in lateral view (10) and uncus in oblique ventral view (11). Scales, 0.5 mm. Figs. 12–13. Male genitalia of *Pomponia surya* Distant. Pygofer in ventral view (12) and uncus in lateral view (13). Scale, 0.5 mm. Figs. 14–16. Male genitalia of *Euterpnosia madhava* (Distant) (comb. nov.) (14, 15) and *E. crowfooti* (Distant) from Nepal (16). Pygofer in ventral (14) and lateral (15, 16) views. Scales, 0.5 mm.



In Nepal, this species is said to have been found in mosses on *Rhododendron* tree-trunks (HAYASHI, in press). DISTANT (1906) also stated that this species settles in the moss on oak-trees. According to BARONI URBANI *et al.* (1973), a temperate forest is developed at Thimphu, Bhutan, and is mainly composed of coniferous and *Quercus* trees.

### **Platylomia saturata** (Walker, 1858)

*Dundubia saturata* WALKER, 1858, List Hom. Brit. Mus., Suppl., 1858: 6.

*Cosmopsaltria saturata*: DISTANT, 1891, Mon. Orient. Cicad., p.54.

*Platylomia saturata*: DISTANT, 1906, Faun. Brit. Ind., Rhynch., 3: 105.

*Macrosemia saturata*: KATO, 1932, Mon. Cicad., p.166.

*Meimuna saturata*: OUCHI, 1938, J. Shanghai Sci. Inst., 3, 4: 92.

*Dundubia obtecta*: WALKER, 1850, List Hom. Brit. Mus., 1: 47 (nec FABRICIUS, 1803).

Specimen examined: 1 ♀, Gogona (3100 m), C. Bhutan, VII.1972 (NMB).

Only a ♀ specimen is available and identified with *saturata*, because of its ovipositor (sheath) extending beyond the 9th abdominal segment and because of the agreement in spots and markings on the body and wings.

This species, new to Bhutan, was known from India (Assam, Darjeeling, etc.), Bangladesh (Sylhet), Sikkim, Nepal, etc.

DISTANT (1912) described *P. insignis* from Bhutan, which is very close to *saturata* in the coloration and markings but is distinguishable by the shape of the ♂ operculum as was noted by DISTANT (1916). The ♀♀ of *insignis* have not yet been described.

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