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New species and records of Tettigoniidae from India (Ensifera)

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A list of 24 species of Tettigoniidae from India (mainly North East India) is given which were recently collected by collaborators of the Zoological Survey of India. Eight species are described as new: *Elimaea (Orthelimaea) carispina* n. sp., *Mirollia longipinna* n. sp., *Ducetia dichotoma* n. sp., *Himertula pallisignata* n. sp., *Holochlora traba* n. sp., *H. tumida* n. sp. (Phaneropterinae), *Onomarchus bisulcatus* n. sp. (Pseudophyllinae), and *Kuzicus (Kuzicus) megaterminatus* n. sp. (Meconematinae). The types and other specimens are deposited in the collection of the Zoological Survey of India, Calcutta.

Key words: Ensifera, Tettigoniidae, India, new species; new records.

INTRODUCTION

The katydid fauna of the Indian subcontinent is still very insufficiently known. In contrast to the Caelifera and the Grylloidea, there is no monographic treatment of the tettigoniid fauna of India. Thus for identification of species, one has to rely on the old monographs of e.g. STÅL (1874), BRUNNER (1878, 1893, 1895), or REDTENBACHER (1891) which are out of date today. In addition one has to consult numerous original publications. One subfamily and few genera have been revised more recently (e.g. RAGGE, 1956, 1961; BEIER, 1962; INGRISCH, 1990a; JIN & KEVAN, 1992). Recent records on the Tettigoniidae of India and Nepal are scarce (INGRISCH, 1986, 1990b; KEVAN & JIN, 1993). It is thus not surprising that intensifying the research on the tettigoniid fauna of India reveals many new taxa and records.

The present paper deals with a small collection of Tettigoniidae made by collaborators of the Zoological Survey of India in different parts of the country, but mainly in North-East India. The collection comprises 24 species, 8 of them are new to science, 4 are new records for India, 3 are new regional records, and the occurrence of 9 species could be expected from the data in the literature. The material on which the study is based is deposited in the Zoological Survey of India, Calcutta (ZSI); one specimen is in the collection of S. INGRISCH (CI).

LIST OF SPECIES AND DESCRIPTIONS

Phaneropterinae

Elimaea* (s. str.) *subcarinata (STÅL, 1861)

Distribution: The genus was recently partially revised and *E. subcarinata* confirmed as a valid species (INGRISCH, 1998b). The species is with certainty known

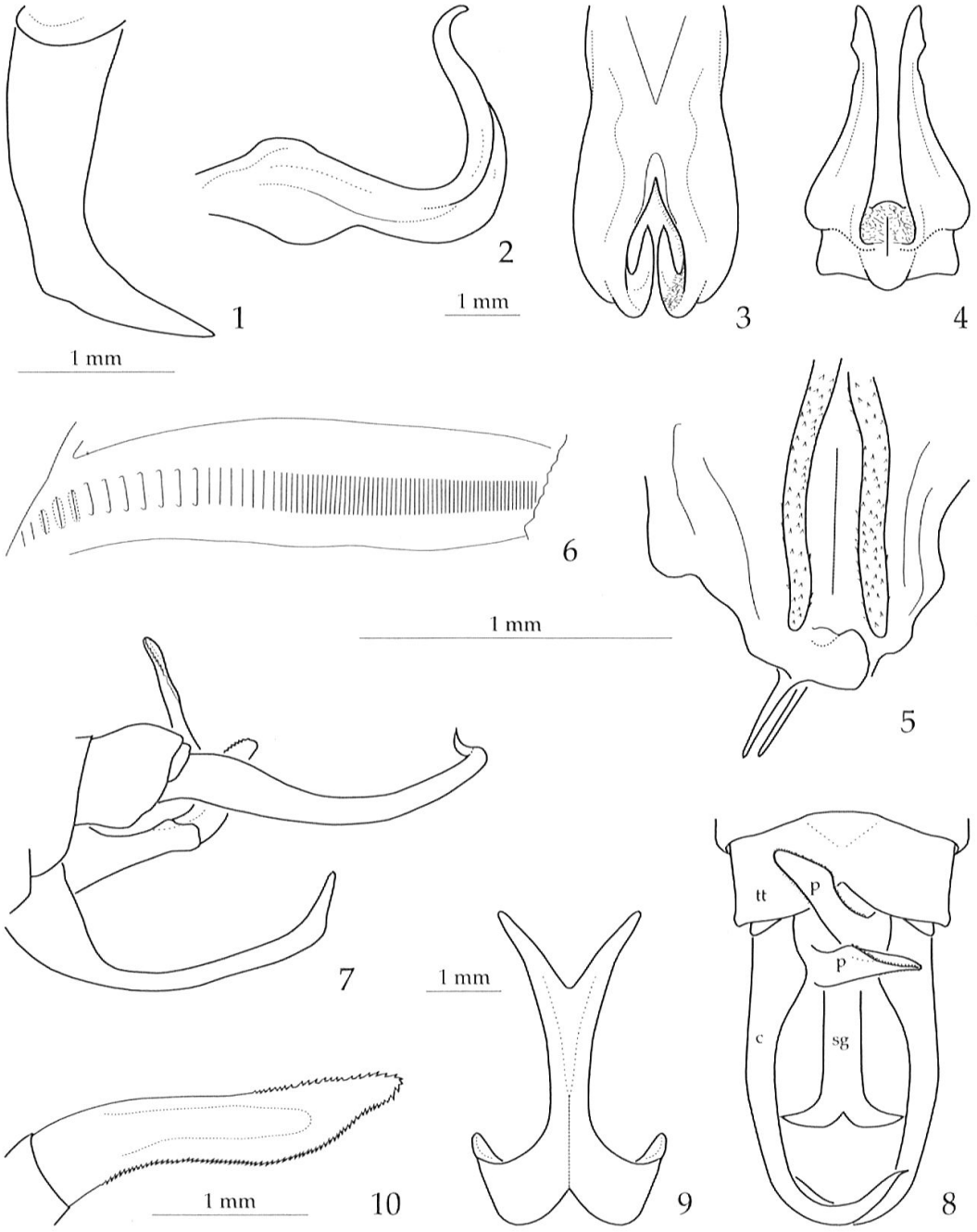
from Hongkong, Thailand and NE India. The specimens at hand are the first certain record for India.

Localities: 1 ♂, 1 ♀, Mizoram, Teirei, Aizawl, 13.XI.1995, M.S. SHISHODIA; 1 ♂, West Bengal, Jalpaiguri, 18.XII.1986, R.S. BARMAN.

Elimaea (Orthelimaea) insignis (WALKER, 1869)

Distribution: India, Assam, Nepal, China.

Locality: 1 ♂, Manipur, Sang Song, Mao 5763 ft., 13.IX.1975, M.S. SHISHODIA.



Figs 1–10. – *Elimaea (Orthelimaea) carispina* n. sp. ♂ (holotype): 1, left cercus; 2, subgenital plate in lateral view; 3, do. in ventral view; 4, do. in apical view; 5, phallus in dorsal view; 6, stridulatory file. – *Mirollia longipinna* n. sp. ♂ (holotype): 7, apex of abdomen in lateral view; 8, do. in dorsal view; 9, subgenital plate in ventro-apical view; 10, left phallus sclerite. – Abbreviations: c cercus, p sclerotised projection of phallus, sg subgenital plate, tt last abdominal tergite.

Elimaea (Orthelimaea) carispina n. sp. (Figs 1–6, 47)

Holotype. – ♂, India, Jawalgiri, N. Salem, Madras, 9.VI.1931, F.R.I. (ZSI).

Description. Fastigium verticis narrow conical, dorsally furrowed, sloping anteriorly and separated by a wide furrow from fastigium frontis. Pronotum with disc rounded, apical area flattened, transverse sulcus just behind middle (in sixth tenth of pronotal length); anterior margin slightly concave, posterior margin rounded; paranota longer than high, humeral sinus distinct. Fully winged. Tegmen widest before middle; radius sector branching slightly behind middle (Fig. 47). Anterior femur straight. Tibial tympana conchate on both sides. Anterior tibia with a dorso-apical spur at both sides, ventral margins with 7 external and 6 internal spines and with an apical spur at both sides. Mesofemur with a few spinules on ventro-external margin; mesotibia with spines on both ventral margins and with 4 apical spurs. Genicular lobes of anterior and medial legs bi-spinose but spines very small [posterior legs absent in specimen at hand].

Male. Stridulatory file on underside of left tegmen with more than 80 teeth which are spaced in basal area and gradually becoming denser towards apical area [apex of stridulatory file damaged in specimen at hand] (Fig. 6). Tenth tergite with apex subtruncate (faintly sinuate). Cerci hatchet-shaped, strongly bent mediad before apical area, apex acute (Fig. 1). Subgenital plate in baso-central area greatly bulging but membranous and sunk in middle of bulging area; lateral surface bent in a circa 90°-angle from disc, slightly furrowed and not very high; subgenital plate split into 2 compressed, deviating lobes behind basal third; somewhat behind middle of length of subgenital plate these lobes are curved dorso-craniad in a more than 90°-angle and approaching each other again, furrowed and narrowed towards apex; shortly before apex curved caudad; apex acute; dorsal surface of lobes in circa medial half covered with numerous minute spinules (Figs 2–4). Phallus: dorsal surface with a pair of longitudinal carinae covered with numerous spinules; apex of dorsal valves terminating in a long and thin, hyaline spine (Fig. 5).

Female unknown.

Coloration. Uniformly dirty brown (discolored; probably green when alive). Antennae with scapus and pedicellus light; flagellum in basal area with external surface black, internal light (otherwise broken).

Measurements of male (length in mm): body 17; pronotum 4.0; tegmen 29.5; tegmen-width 5.0; hind wing projecting 5.0; anterior femur 7.0.

Discussion. The new species comes close to *E. securigera* BRUNNER, 1878. It differs by the cercus having the apical part narrow acute (not broad and truncate) and by the subgenital plate with the apical lobes less strongly deviating in middle and the basal area wider. The phallus is not described for *E. securigera*.

Derivation of name. The name refers to the phallus which is provided with two carinae covered with spinules.

Mirollia longipinna n. sp. (Figs 7–10, 48)

Holotype: ♂, India, Meghalaya, Pohbazar, Shillong, 19.IX.1991, R.K. VARSHNEY (ZSI).

Description. Fastigium verticis narrower than scapus, narrowing towards apex, dorsally furrowed, in lateral view sinuate, separated by a wide shallow groove from acute-angular fastigium frontis. Pronotum faintly inflated (male); disc rounded, apical area flat and shouldered; anterior and posterior margins subtruncate in middle; with 3 transverse sulci, first and third sulcus interrupted in middle, se-

cond sulcus (= principal sulcus) Y-shaped; with a strong medial carina which is interrupted between second and third sulcus; paranota almost as long as high, humeral sinus distinct. Tegmen with a network of large irregular cells, but less irregular than in other species of the genus and not only subcosta and radius, but also radius sector and media distinct (Fig. 48). Anterior tibia with a ventro-apical spinule at both sides; tibial tympana covered on internal side by a conchate projection, on external side free. Knee lobes of all legs obtuse.

Male. Tenth abdominal tergite with apex broad and shallowly excised in middle (Fig. 8). Epiproct small, tongue-shaped with a medial furrow. Cerci long, basal area widened and on internal side densely covered with short hairs; apical area strongly curved and gradually narrowed into the acute apical tooth (Figs 7–8). Subgenital plate with a broad basal and a narrow apical part; narrow part widening towards apex; apical angles long and conically projecting, apex triangularly excised in between (Fig. 9). Phallus with 2 long, compressed, subhyaline sclerites, covered on lateral and ventral side in circa basal half by a membranous fold; apical half curved dorsad and with crenulate margins (proximal margin crenulate over almost all of its length, caudal margin in apical area only), apical area triangular with obtuse angle (Fig. 10).

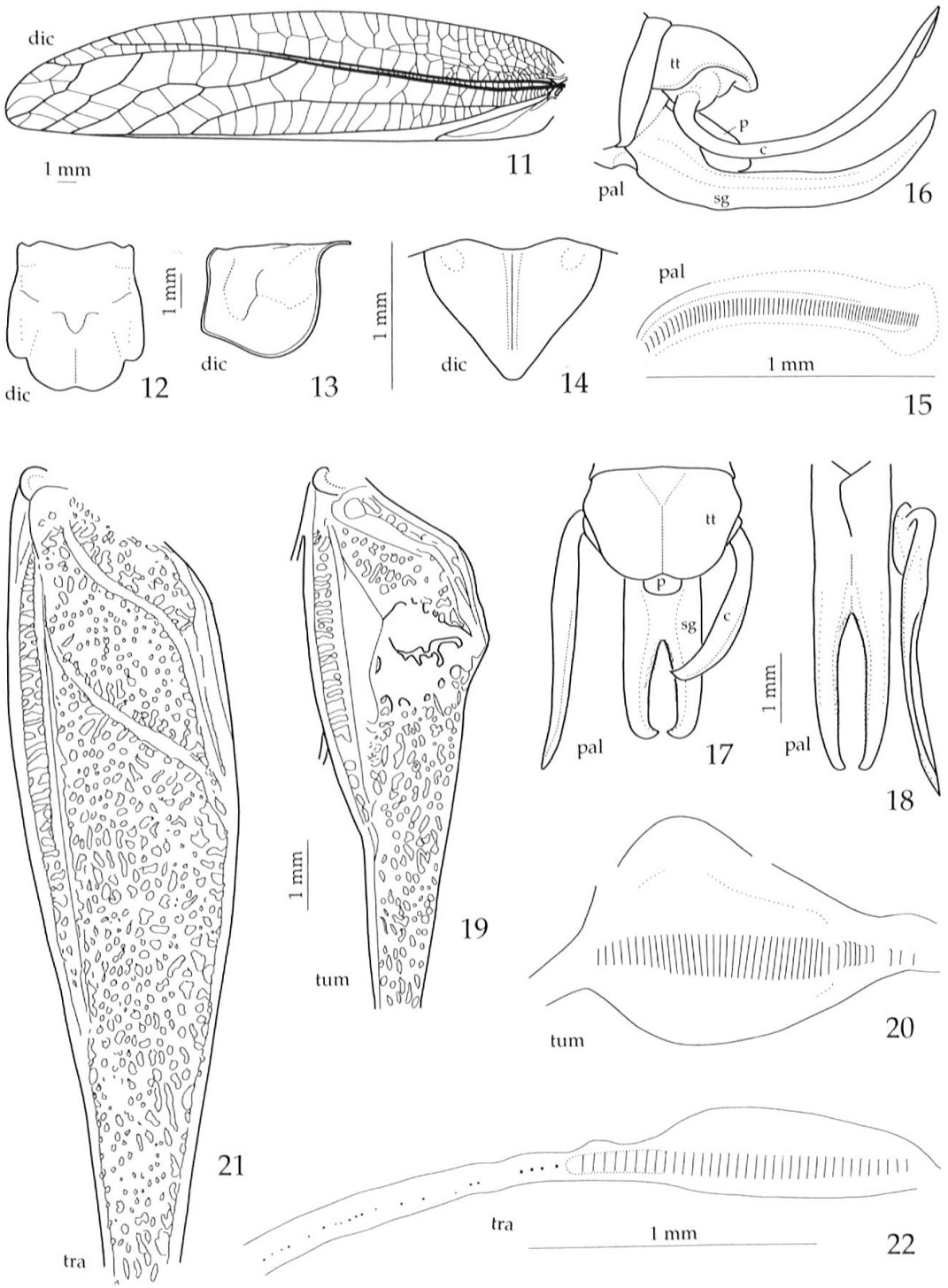
Female unknown.

Coloration. Probably green when alive. The specimen at hand is discolored, uniformly yellowish brown with hardly any markings. Scapus of antenna with a black dot on ventral surface (with antenna pointing anteriorly). Tegmen with stridulatory vein medium brown.

Measurements of male (in mm): body 15; pronotum 4.5; tegmen 25; tegmen-width 5.5; anterior femur 4.0; postfemur 13.2.

Discussion. The genus was recently discussed by INGRISCH (1998a). The new species belongs to the *carinata* group. It differs from *M. carinata* DE HAAN, 1842 (Java – Malaysia) by longer cerci with the apex less strongly curved, by the subgenital plate with the apex terminating into 2 long, deviating, acute lobes (not short, angular, parallel lobes). From *M. fallax* BEI-BIENKO, 1962 (Yunnan), it differs by the subgenital plate with the narrow part widening towards apex (not with parallel sides) and terminating into long (not short) diverging lobes. The narrow apical part of the subgenital plate is similar to that of *M. composita* BEI-BIENKO, 1962 (Yunnan), it differs by the subgenital plate with the apex terminating into 2 long (not short) diverging lobes and apex angularly (not roundly) excised in between. The cerci are similar to that of *M. liui* BEI-BIENKO, 1957 (Yunnan) but less strongly curved and hardly re-curved before tip (instead of distinctly re-curved). The subgenital plate and the phallus sclerites are also similar to that of *M. liui*, the phallus sclerites are however compressed and broad to apex (not conical and acute). From *M. quadripunctata* INGRISCH, 1990 (North Thailand), the new species differs by more slender cerci which are gradually narrowed into the apical tooth (not suddenly constricted before apical tooth), by the subgenital plate terminating into 2 shorter, narrow, deviating lobes (not greatly split, with 2 little deviating lobes), and by the phallus sclerites which are compressed and broad to apex. From *M. caligata* INGRISCH, 1998 (North Thailand), the new species differs by the apex of the cerci gradually narrowed into the apical tooth, by the subgenital plate with apex split into 2 shorter, conical lobes (not 2 very long, broad lobes), and by the phallus sclerites without boot-shaped apex. From *M. hexapinna* INGRISCH, 1998, *M. hamata* INGRISCH, 1998 (both Central Thailand) and *M. bigemina* INGRISCH, 1998 (Darjeeling), it differs by having only

one pair of phallus sclerites (not 2 or 3) and by details of the cerci and subgenital plate.



Figs 11–22. – *Ducetia dichotoma* n. sp. ♀ (holotype): 11, left tegmen; 12, pronotum in dorsal view; 13, do. in lateral view; 14, subgenital plate. – *Himertula pallisignata* n. sp. ♂ (holotype): 15, stridulatory file; 16, apex of abdomen in lateral view; 17, do. in dorsal view; 18, subgenital plate and left cercus in ventral view. – *Holochlora tumida* n. sp. ♂ (holotype): 19, stridulatory area of left tegmen; 20, stridulatory file. – *Holochlora traba* n. sp. ♂ (holotype): 21, stridulatory area of left tegmen; 22, stridulatory file. – Abbreviations: c cercus, p sclerotised projection of phallus, sg subgenital plate, tt last abdominal tergite.

Derivation of name. The name refers to the phallus sclerites which are of the shape of long paddles (lat. pinna = fin).

Ducetia japonica (THUNBERG, 1815)

Distribution: Oriental Region.

Locality: 1 ♀, Arunachal Pradesh, Bandardewa, L. Subansiri, 19.X.1996, S.K. MANDAL.

Ducetia dichotoma n. sp. (Figs 11–14, 49)

Holotype: ♀, India, Arunachal Pradesh, Sonajuli, Chessa, Papumpare, 20.X. 1966, S.K. MANDAL (ZSI).

Description. Fastigium verticis narrow conical, dorsally furrowed, apex subacute, separated from fastigium frontis by a rectangular step. Vertex with anterior margin forming a small spinule at angle beside compound eyes. Pronotum with disc rounded into paranota, only apical area flat and shouldered; transverse sulcus distinct on disc and paranota, obsolete on lateral angles, on disc V-shaped, situated in fourth sixth of pronotum length; anterior margin sinuate (concave in middle), posterior margin broadly rounded but slightly concave in middle; paranota about as high as long, anterior angle almost rectangular, posterior angle broadly rounded, humeral sinus absent but posterior margin roundly curved to apical area of pronotum (Figs 12–13). Meso- and metasternal lobes rounded. Tegmen surpassing hind knees; radius sector branching slightly before or in middle of tegmen length (4.4th to 4.8th tenth of tegmen length), forked, stem of radius with 2 more branches (Fig. 11). Hind wings caudate. Anterior coxa with a small spine. Anterior femur slightly compressed. Knee lobes of all legs bispinose. Tibial tympana open on both sides. Femora with the following number of spines on ventral margins: Profemur 6–7 external, 5–8 internal; mesofemur 11–12 external, no internal; postfemur 11–12 external, 1–2 internal. Pro- and mesotibiae each with 4 apical spurs and with the following number of spines: protibia 4–5 dorso-external, 2–4 dorso-internal; 9–11 ventro-external, 9–10 ventro-internal; mesotibia 4 dorso-external, 6–8 dorso-internal; 13–14 ventro-external, 12–13 ventro-internal; posterior tibia on dorsal margins with numerous large spines mixed with small spinules, usually space between 2 large spines filled with 2–3 spinules, spines on ventral margins scarce near base, close towards apex.

Male unknown.

Female. Epiproct triangular, apex obtuse. Cerci conical, apex pointing. Subgenital plate triangular, with a deep medial furrow, apex obtuse (Fig. 14). Ovipositor falcate, dorsal margin serrate in apical half, ventral margin before apex.

Coloration. Green, a narrow yellow medial band on disc of pronotum and dorsal margin of tegmen. Tegmen with little conspicuous black dots in cells.

Measurements of female (length in mm): body 19; pronotum 4.3; tegmen 26.5; tegmen-width 7.0; hind wing projecting 6.0; anterior femur 8.0; postfemur 23.0; posttibia 25; ovipositor 6.0.

Discussion. The new species is similar to *D. furcata* RAGGE, 1961, from Taiwan, the only other species of *Ducetia* with the radius branching in a dichotomous fashion. It differs by uniformly green coloration (without dark markings on vertex, disc, antennae, hind margin of fore wings or legs), comparatively shorter pronotum and legs in spite of longer wings; hind wings surpassing tegmina for ¼th – ⅕th of tegmen length (not $^1/_{10}$th).

Derivation of name. The name refers to the dichotomous furcation of the radius sector of the tegmen.

Letana gracilis INGRISCH, 1990

Distribution: described from Ledo road, NE India.

Locality: 1 ♂, Mizoram, Teirei, 12.XI.1995, M.S. SHISHODIA.

Himertula pallisignata n. sp. (Figs 15–18, 50)

Holotype: ♂, India, Rajasthan, Sirohi Rd., 470m, Sirohi, 5.IX.1984, M.S. SHISHODIA (ZSI).

Description. Fastigium verticis conical, narrower than scapus, dorsally furrowed, separated by a step-like incision from fastigium frontis. Pronotum long and narrow, disc rounded in anterior, flattened in posterior area, lateral angles rounded into paranota; anterior margin slightly concave, posterior margin faintly rounded, almost subtruncate; paranota circa two times longer than high (3.2:1.5 mm), swollen in posterior area. Prosternum unarmed. Meso- and metasternal lobes rounded. Tegmen narrow, reaching apical third of postfemur, hind wings projecting and just surpassing hind knees (Fig. 50). Anterior coxa unarmed. Knee lobes of pro- and mesofemora bi-spinose, of postfemur obtuse, dorsal apex of hind knees truncate. Tibial tympana open on both sides. Anterior tibia with dorsal and lateral surfaces furrowed, with 3 apical spurs (the dorso-internal absent) and one spine on ventro-internal margin.

Male. Stridulatory file with about 69 teeth (Fig. 15). Tenth abdominal tergite prolonged behind and curved ventrad, faintly furrowed in midline; apical margin slightly concave in middle, broadly rounded on both sides (Fig. 17). Epiproct triangularly rounded. Cerci long, surpassing apex of subgenital plate; cylindrical and strongly curved at base, otherwise compressed and broadly furrowed on ventro-internal surface; apex acute (Figs 16–18). Subgenital plate narrow, divided from apex for almost half of its length; lobes moderately curved dorsad and covered on internal surface with black spinules (Figs 16–18). Phallus with a large beam-shaped sclerite reaching about apex of last abdominal tergite (Figs 16–17).

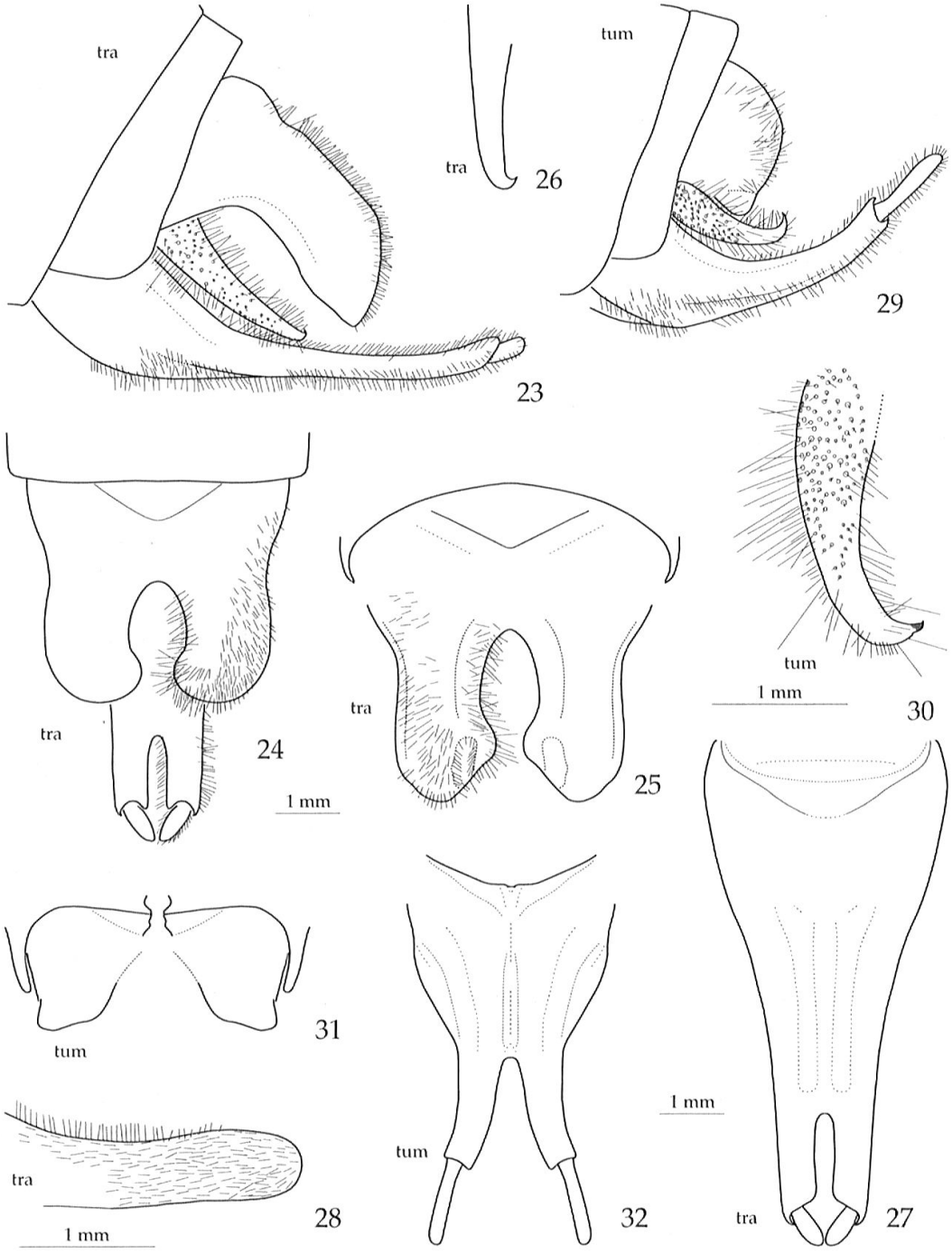
Female unknown.

Coloration. Yellowish brown (discolored, probably green when alive); fastigium verticis, a medial band on vertex, disc of pronotum and tegmen behind radius light reddish brown, but pattern not very conspicuous. Posttibia with a faint, white, subbasal ring.

Measurements of male (length in mm): body 10; pronotum 3.2; tegmen 14.0; tegmen-width 2.5; hind wing projecting 6.0; anterior femur 4.3; postfemur 16.0; posttibia 18.0.

Discussion. The new species is similar to *H. marginata* (BRUNNER, 1878) and *H. kinneari* UVAROV, 1923 (both living in North India and the Himalaya). It differs by the pale and little conspicuous (not striking) colour pattern and by the male abdominal terminalia: From *H. marginata*, it differs by the last abdominal tergite which is considerably prolonged and has the apex concave in middle (not short and the apex narrowly excised) and by the cerci which are narrower at the base and have the compressed part less strongly curved. From *H. kinneari*, it differs by the subgenital plate which has the apical lobes slightly curved mediad before apex (not strongly curved laterad) and by the cerci which are longer (not shorter) than the subgenital plate.

Derivation of name. The name refers to the rather pale colour pattern.



Figs 23–32. – *Holochlora traba* n. sp. ♂ (holotype): 23, apex of abdomen in lateral view; 24, do. in dorsal view; 25, last abdominal tergite in dorso-apical view; 26, left cercus; 27, subgenital plate; 28, process of phallus. – *Holochlora tumida* n. sp. ♂ (holotype): 29, apex of abdomen in lateral view; 30, left cercus; 31, last abdominal tergite in dorso-apical view; 32, subgenital plate.

Holochlora traba n. sp. (Figs 21–28, 51)

Holotype: ♂, India, Andaman Islands, Rangat, 9.I.1992, A. MISHRA (ZSI).

Description. Fastigium verticis narrow conical, with a fine and deep dorsal furrow, apex obtuse; separated from fastigium frontis by a deep and wide furrow. Pronotum with disc broadly rounded, apical area subflat and shouldered; anterior

margin slightly concave, posterior margin rounded; transverse sulcus weak, restricted to a small V-shaped furrow in middle of sixth tenth of pronotum length; paranota higher than long, posterior margin substraight, obliquely ascending; humeral sinus distinct. Meso- and metasternal lobes rounded. Tegmen largely surpassing hind knees; radius sector branching in middle of tegmen length, forked, radius stem with 3 more lateral branches (Fig. 51). Anterior coxa with a spine. Anterior femur with spinules on ventro-internal margin, mesofemur on ventro-external margin, postfemur on both ventral margins. Genicular lobes of pro- and mesofemur obtuse or with a very minute spinule, of postfemur bi-spinose. Tibial tympana conchate on internal, open on external surface. Anterior tibia dorsally furrowed, with one dorso-apical spur on each side and with 3 spines and 1 apical spur on both ventral margins.

Male. Stridulatory area of tegmen with hardly any differentiation on dorsal surface (Fig. 21). Stridulatory vein not swollen. Stridulatory file on underside of left tegmen with 36 distinct teeth and a series of small tubercles [We are not certain whether the stridulatory file of the specimen at hand is damaged or entire] (Fig. 22). Right tegmen without mirror. Tenth abdominal tergite with apex split into two long semi-tubular, obtuse lobes, deeply excised in between; lobes on internal margin before apex with an obtuse swelling (Figs 24–25). Cerci conical, just before apex curved and apex with a minute acute tooth (Fig. 26). Subgenital plate elongate; disc with a weak medial and two lateral carinae; apical area narrowly split into 2 compressed lobes; styli small, shorter than half the length of the divided area (Fig. 27). Lobes of last abdominal tergite, cerci, and subgenital plate densely setose (Figs 23–24). Phallus with a straight, cylindrical, but slightly compressed apical projection, densely covered with clinging hairs (Fig. 28).

Female unknown.

Coloration. Uniformly greenish brown (discolored, probably green when alive).

Measurements of male (length in mm): body 22; pronotum 7.5; tegmen 42; tegmen-width 11; hind wing projecting 5; anterior femur 6; postfemur 27; posttibia 29.

Discussion. The new species belongs to the *ensis* group. It is peculiar for the reduced stridulatory apparatus with an incomplete stridulatory file and the absence of a mirror. Another unique character is the possession of a beam-shaped projection of the phallus covered with clinging hairs. *H. traba* differs from *H. ensis* (De Haan, 1842) by the lobes of the tenth abdominal tergite curved ventrad only near apex (not behind middle), by the subgenital plate having the narrow apical area longer and divided for a shorter distance. Judging from Fig. 138 in Karny (1926), males of *H. ensis* also have a phallus sclerite – although this is not described – but of different shape than in the new species. From *H. geniculata* Brunner, 1893, *H. traba* differs by the cerci which are only curved at apex (not in middle) and have the apex unispinose (not bi-spinose). From *H. nigrospinulosa* Brunner, 1893, the new species differs by uniform coloration and postfemur without markings, smaller size with shorter and narrower tegmen, and by the postfemur having 6–7 (not 3–4) spinules on the ventral margins.

Derivation of name. The name refers to the phallus sclerite and is derived from lat. trabs = beam.

Holochlora tumida n. sp. (Figs 19–20, 29–32, 52)

Holotype: ♂, India, West Bengal, Sudarbans, Parganas, 16.IX.1983, A.K. Hazra (ZSI).

Description. Fastigium verticis narrow conical, with a fine and deep dorsal furrow, apex obtuse; separated from fastigium frontis by a deep and wide furrow. Pronotum with disc broadly rounded, apical area subflat and shouldered; anterior margin slightly concave, posterior margin rounded; transverse sulcus weak, V-shaped, in middle of sixth tenth of pronotum length (0.55:1.0); paranota higher than long, ventral and posterior margins together broadly rounded; humeral sinus distinct. Mesosternal lobes angular, obtuse; metasternal lobes rounded. Tegmen surpassing hind knees; radius sector branching slightly before middle of tegmen length, forked, radius stem with 3 more lateral branches (Fig. 52). Anterior coxa with a spine. Anterior femur with spines on ventro-internal margin, mesofemur on ventro-external margin, postfemur on both ventral margins. Genicular lobes of profemur uni-spinose, of meso- and postfemur bi-spinose; genicular spines of anterior and medial legs very small. Tibial tympana conchate on internal, open on external surface. Pro- and mesotibia with an apical spur at all four angles and with the following number of spines: anterior tibia 2 dorso-external, 0 internal, 4–5 ventro-external, 6 internal; mesotibia 0 dorso-external, 4 internal, 11–12 ventro-external, 8 internal.

Male. Stridulatory area of tegmen on dorsal side with stridulatory vein and following vein swollen and with an elongate transparent area lateral of swelling (Fig. 19). Stridulatory vein on underside of left tegmen greatly broadened and bulging, with about 46 teeth (Fig. 20). Tenth abdominal tergite with apical lobes short [central area destroyed in specimen at hand] and with a compressed widening before latero-apical angle (Fig. 31). Cerci short, conical, slightly curved, before apex strongly curved, apex subacute (Fig. 30). Subgenital plate elongate, in undivided basal area with a medial and two lateral carinae; in little more than apical third divided into two compressed deviating lobes with subparallel margins; styli narrow, longer than two thirds the length of the divided area (Figs 29, 32).

Female unknown.

Coloration. Uniformly yellowish brown (discolored, probably green when alive).

Measurements of male (length in mm): body 21; pronotum 5.8; tegmen 35; tegmen-width 7.5; hind wing projecting 5; anterior femur 6; postfemur 26; posttibia 28.

Discussion. *H. tumida* is a small species of the *venosa* group. It is similar to *H. nigrotympana* INGRISCH, 1990, but differs by the stridulatory vein which is more strongly bulging. From the same species and from *H. venosa* STÅL, 1873, *H. hebardi* KARNY, 1926, *H. vandermeermohri* EBNER, 1934, and *H. semirotundata* XIA & LIU, 1990, the new species also differs by the lobes of the tenth abdominal tergite which are shorter and have the apico-lateral angle more produced, and by the subgenital plate which is divided at apex for a longer distance and has longer styli. From *H. indica* KIRBY, 1906, *H. tumida* differs – apart from smaller size – by the lobes of the tenth abdominal tergite which are shorter and conical (not securiform), and by the subgenital plate which has a long, angular (not short, round) apical emargination and much longer styli.

Derivation of name. The name refers to the stridulatory vein which is strongly swollen (lat. tumidus = swollen).

Holochlora nigrotympana INGRISCH, 1990

Distribution: Described from Central Thailand, recently also recorded from Bhutan (INGRISCH, in press).

Locality: 1 ♀, Mizoram, Aizawl, Circuit Honse, 12.IV.1994, A.K. HAZRA.

Phaneroptera myllocerca RAGGE, 1956

Distribution: Known from N-India (type), Burma, Yunnan, Kashmir and Sikkim.

Localities: 1 ♂, Sikkim, Dharimdin, 2854m, 18.III.1959, A.G.K. MENON; 1 ♂, Arunachal Pradesh, Jegong, Rupa, W. Kameng, 13.X.1996, S.K. MANDAL.

Isopsera spinosa INGRISCH, 1990

Distribution: Previously known from Darjeeling, Nepal and China.

Localities: 1 ♂, Manipur, 2 km north of Mao, 14.IX.1975, M.S. SHISHODIA; 1 ♂, Arunachal Pradesh, Bandardewa, L. Subansiri, 19.X.1996, S.K. MANDAL; 1 ♀, Arunachal Pradesh, Chimpu, 3000 ft., Itanagar, 17.X.1996, S.K. MANDAL.

Khaoyaiana nitens INGRISCH, 1990

Distribution: Described from Central Thailand, also recorded from China (YIN & XIA, 1994). Genitals and stridulatory file agree completely with specimens from the type locality.

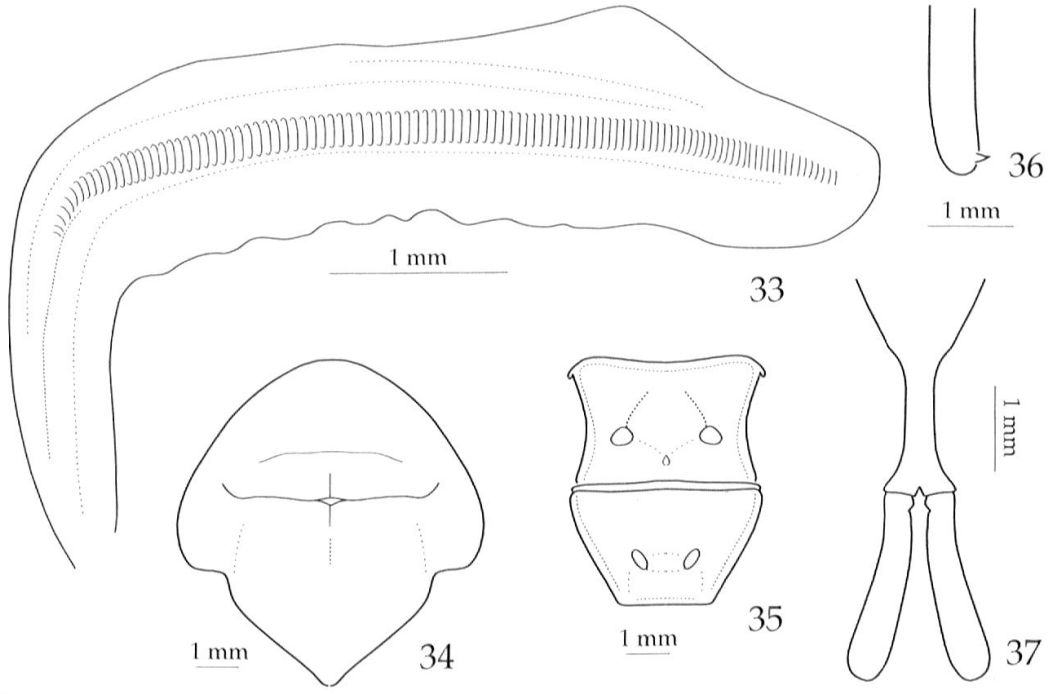
Locality: 1 ♂, Mizoram, Saiha, 800m, 6.IV.1994, A.K. HAZRA.

Pseudophyllinae

Onomarchus bisulcatus n. sp. (Figs 33–37, 53)

Holotype: ♂, India, Mizoram, Chungtlang, 18.IX.1993, A.R. LAHIRI (ZSI).

Description. Rather small for the genus. Fastigium verticis slightly surpassing rim of antennal scrobae. Pronotum smooth with very few isolated tubercles; with two transverse furrows in anterior half; anterior margin broadly rounded, posterior margin angular (Fig. 34); paranota acute-triangular in general outline but ventral



Figs 33–37. *Onomarchus bisulcatus* n. sp. ♂ (holotype): 33, stridulatory file; 34, pronotum; 35, thoracic sternites; 36, left cercus; 37, apex of subgenital plate with styli.

margin truncate, latero-anterior margin faintly convex with very faint sinuosities in ventral half, latero-posterior margin concave. Tegmen broad but rather narrow for the genus (Fig. 53); subcosta running distant from radius to behind branching of radius sector, and after a short approach deviating again; media with a sinuate curvature in basal area, distance between media and cubitus – at height of branching of radius sector – slightly wider than between media and radius (27:23). Meso- and metasterna transverse, mesosternum with a minute tubercle at anterior-lateral angle, metasternum narrowing posteriorly (Fig. 35). Legs with the following number of spines on ventral margins: profemur 9 indistinct external and 5–7 indistinct internal, mesofemur 6–7 minute external and 8 minute internal, postfemur 3–5 minute and 6–7 large external, 11–12 minute internal; protibia 5–6 minute external and 6–7 minute internal, mesotibia 7 minute external and 8 indistinct internal, posttibia 8–9 small external and 6–9 minute internal. All tibiae with 2 ventro-apical spurs, without dorsal spurs. Posttibia on dorsal margins with 5–6 minute external and 5–6 large and broad internal spines.

Male. Stridulatory file with about 108 teeth (Fig. 33). Epiproct tongue-shaped, flattened. Cerci short and straight, apex obtuse and with a spinule at internal side (Fig. 36). Subgenital plate setose; broad basal area with sloping lateral margins; handle-shaped apical area little shorter than slightly compressed styli (1.7:2.3 mm) (Fig. 37).

Female unknown.

Coloration. Discolored, probably green when alive (in specimen at hand tegmen yellowish green, body and legs yellowish brown). Tegmen with stridulatory vein reddish. Dorso-internal spines of posttibia darkened on internal surface.

Measurements of male (length in mm): body 29; pronotum 7.3; tegmen 54; tegmen-width 17.5; length of stridulatory area 13.5; stridulatory vein 4; anterior femur 9.5; postfemur 17.5; styli 2.3.

Discussion. Species of the genus *Onomarchus* STÅL, 1874, occur from South China to the Sunda Islands, a single female was recorded from South India (JONG, 1946). Three species with several synonyms are recognised in the last revisions of the genus (JONG, 1939; BEIER, 1954, 1962), while OTTE (1997) lists some of the synonyms as distinct species. The species are mainly based on female characters. It may thus be expected that some of the synonyms as well as undescribed forms will prove to be distinct species on the base of male characters, especially the stridulatory vein which was not described for a single species of the genus.

The specimen at hand differs significantly from the previously described species. From *O. leuconotus* (SERVILLE, 1838) and *O. uninotatus* (SERVILLE, 1838), it differs by the pronotum having 2 transverse furrows (not only one) [In a female of *O. cretaceus* (SERVILLE, 1838) at hand from Sabah, there are also 2 transverse furrows; the number of furrows is thus obviously not a generic character as stated by BEIER (1954, 1962)], it also differs by significantly smaller size and narrower tegmen, a shorter stridulatory vein and shorter styli; from *O. leuconotus*, it also differs by the smooth genae (not punctured). With regard to size and the rather narrow tegmen, the new species is close to *O. cretaceus*. It differs by the smooth pronotum (not rugose), by the metasternum being wider than long (not longer than wide), by shorter styli and by slightly larger size and wider tegmen.

O. uninotatus carli JONG, 1946, from South India is only known from the female holotype and regarded a synonym of *O. uninotatus* by BEIER (1954, 1962), but its status should be re-evaluated in a revision. Only coloration (which in this genus does not fully apply to the male coloration) and a few female characters are

described, but comprehensive information on the armature of the legs is provided. The number of spines of most legs differ strikingly from that of the new species. But it is not certain whether those spines are a reliable character.

Derivation of name. The name refers to the pronotum which is cut by two transverse sulci.

Paramorsimus robustus (BRUNNER, 1895)

Distribution: Previously only recorded from Assam (BEIER, 1962).

Locality: 1 ♂, Himachal Pradesh, Sirmour, Ranuka Sanctuary, 28.IX.1992, M.S. VERMA.

Discussion. – The specimen at hand is slightly smaller than in the description given by BEIER (1954, 1962).

Hemigyrus amplus BRUNNER, 1893

Distribution: Previously only known from Burma (BEIER, 1962).

Locality: 1 ♀, Manipur, New Churachandpur, 21.IX.1975, M.S. SHISHODIA.

Discussion. – The specimen at hand is slightly more slender than in the description given by BEIER (1954, 1962).

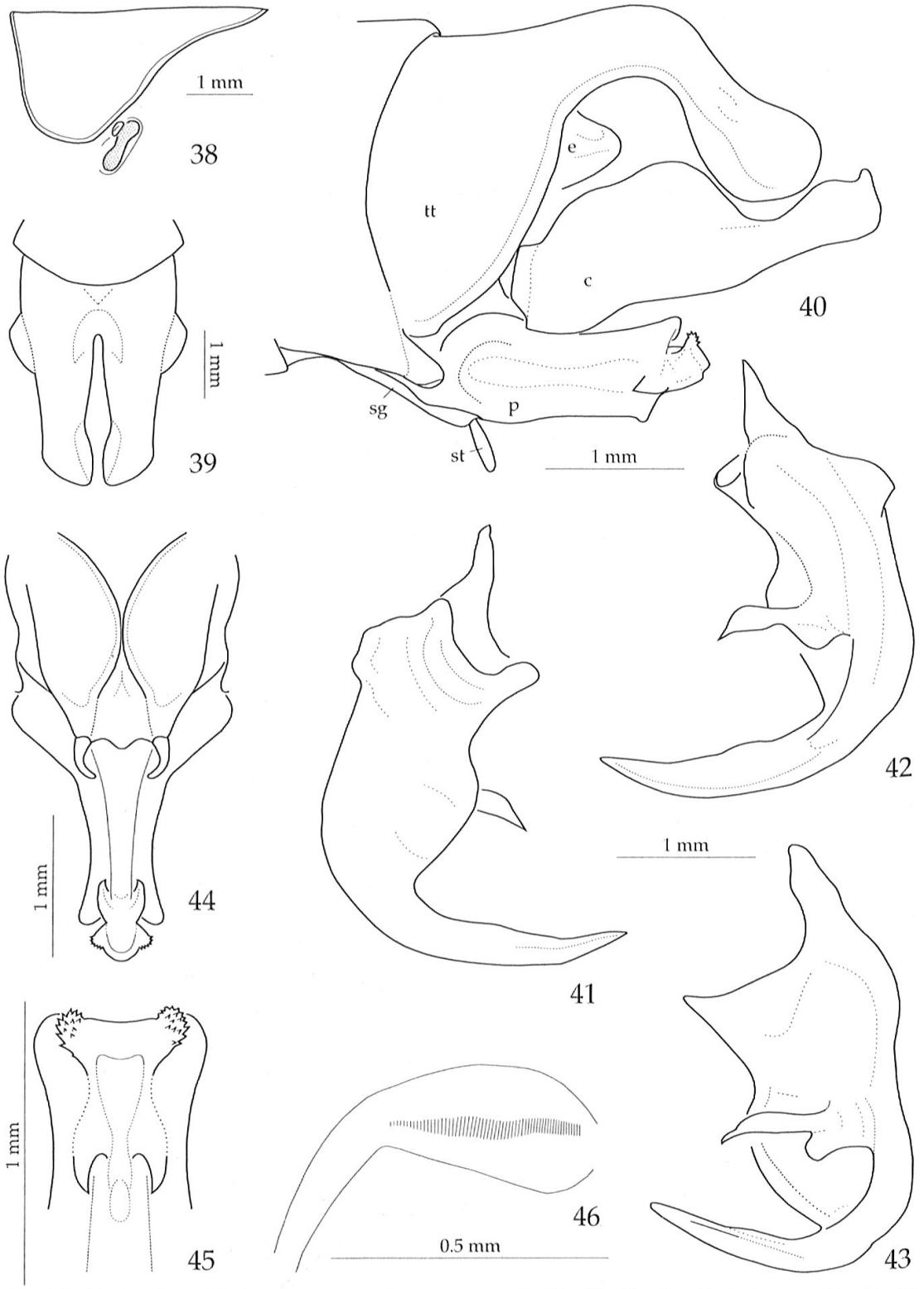
Meconematinae

Kuzicus (Kuzicus) megaterminatus n. sp. (Figs 38–46, 54)

Holotype: ♂, India, Manipur, Mamang, Leikei, Churachandpur, 27.III.1993, D.K. MONDAL (ZSI). – Paratype: 1 ♂, West Bengal, Darjeeling, Manjitar, 30.VI. 1987, W. THOMAS (CI).

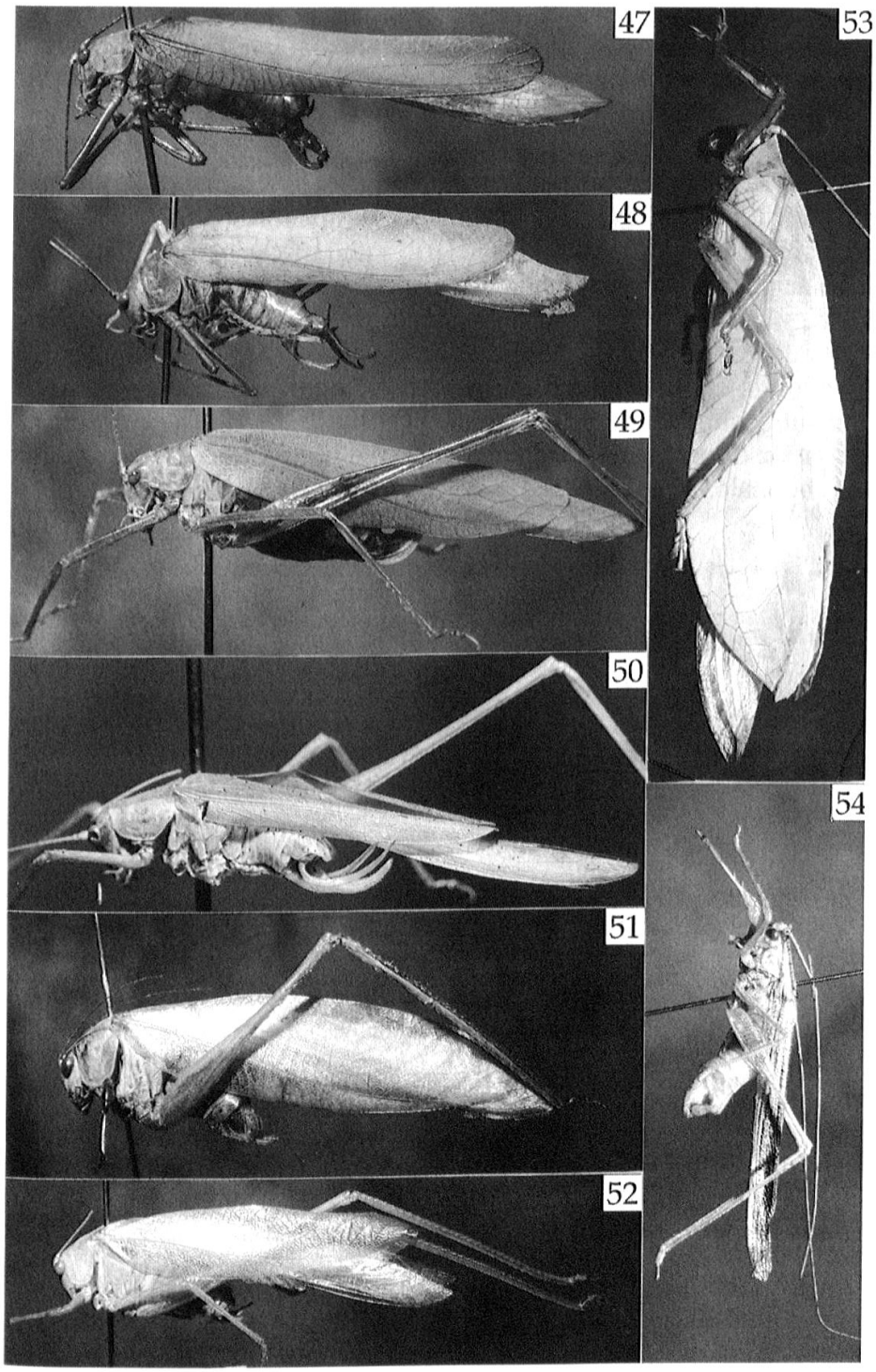
Description. Fastigium verticis conical, not furrowed, apex obtuse. Pronotum prolonged behind and covering stridulatory area of tegmen; disc rounded, apical area flattened and shouldered, there is hardly any trace of a transverse sulcus but disc with a shallow transverse depression about in middle of length separating rounded from flattened areas; anterior margin slightly convex; posterior margin triangularly rounded; paranota with posterior margin sinuate but hardly a trace of a humeral sinus (Fig. 38). Thoracic auditory spiracle large (height 0.8–1.0 mm, width 0.33 mm), kidney-shaped, completely free. Prosternum unarmed. Meso- and metasternum each with a pair of short, obtuse tubercles. Tegmen largely surpassing hind knees; hind wings caudate (Fig. 54). Legs long and thin. Anterior coxa with a spine. Tibial tympana open on both sides. Anterior and medial tibiae with dorsal margins unarmed, without apical spur; ventral margins with (4 –) 5 spines and 1 apical spur on both sides. Postfemur with ventral margins unarmed; hind knee lobes obtuse.

Male. Stridulatory file small, with about 60 teeth (Fig. 46). Tenth abdominal tergite with a pair of large, compressed, apico-medial projections which are curved ventrad and have the external surface flattened, the internal surface excavated; apices subtruncate; each of the projections with a short digitiform process at base on ventro-internal margin (Figs 39–40). Epiproct small, tongue-shaped. Cerci robust in circa basal half, with convex external and slightly concave internal surface, before end of robust area with an acute internal tooth and internal surface behind that tooth deeply excavated; external surface at base with a broad and short, compressed lateral projection; circa in middle of length, cercus curved in a roughly 90° angle



Figs 38–46. *Kuzicus (Kuzicus) megaterminatus* n. sp. ♂ (38–39, 41–43, 46, holotype; 40, 44–45, paratype): 38, pronotum and auditory spiracle; 39, tenth abdominal tergite in dorso-apical view; 40, apex of abdomen in lateral view; 41, left cercus in dorsal view; 42, do. in ventral view; 43, do. in ventro-internal view; 44, subgenital plate and projecting part of phallus in ventral view; 45, apex of phallus in ventro-apical view; 46, stridulatory file. – Abbreviations: c cercus, e epiproct, ph phallus, sg subgenital plate, st stylus, tt last abdominal tergite.

mediad, greatly narrowed, compressed and terminating into an acute apex (Figs 41–43). Subgenital plate circa semi-ovoid, sclerotised at both sides but membranous in middle, with 2 thin cylindrical styli (Figs 40, 44). Phallus with a stout sclerotised process which is largely surpassing the subgenital plate (Figs 40, 44–45): Process with two lateral auricles at base, otherwise beam-shaped, compressed,



Figs 47–54. – 47, *Elimaea (Orthelimaea) carispina* n. sp. ♂ (holotype); 48, *Mirollia longipinna* n. sp. ♂ (holotype); 49, *Ducetia dichotoma* n. sp. ♀ (holotype); 50, *Himertula pallisignata* n. sp. ♂ (holotype); 51, *Holochlora traba* n. sp. ♂ (holotype); 52, *H. tumida* n. sp. ♂ (holotype); 53, *Onomarchus bisulcatus* n. sp. ♂ (holotype); 54, *Kuzicus (Kuzicus) megaterminatus* n. sp. ♂ (paratype).

widening dorsad, dorsal surface furrowed and dorso-lateral margin terminating in a short obtuse projection; in the dorsal furrow there is another furrowed sclerite which is slightly surpassing the apex of the first sclerite, widening at apex and terminating into a – in ventro-apical view – circa X-shaped apex: dorsal branches of X with crenulate margin, ventral branches acute (Fig. 45).

Female unknown.

Coloration. Yellowish brown (probably discolored); eyes reddish brown; antennae annulated. Pronotum with a narrow brown medial band split by a light line.

Measurements of males (length in mm): body 14–15; pronotum 3.8–4.0; tegmen 16.0–17.0; hind wing projecting 4.5; anterior femur 4.3; postfemur 11.0; posttibia 12.

Discussion. The new species comes near *K. denticulata* (KARNY, 1926) from Malaysia. It differs by the tenth abdominal tergite split almost to base, by the shapes of the subgenital plate and the phallus sclerites and by the cerci possessing an internal tooth. The abdominal terminalia are also similar to those of *Xiphidiopsis denticuloides* KEVAN, 1993, from Nepal which probably also belongs to *Kuzicus*. The new species differs by the pronotum being distinctly longer, by the projections of the tenth abdominal tergite which are less strongly curved, and by details of the process of the subgenital plate and the cerci.

Derivation of name. The name refers to the large and complex abdominal terminalia of the male.

Conocephalinae

Conocephalus maculatus (LE GUILLOU, 1841)

Distribution: Tropical regions from Africa to Australia.

Localities: 1 ♂, Mizoram, Aibawk, 17.XI.1995, M.S. SHISHODIA; 1 ♂, North Sikkim, Phadong, 31.X.1992, M.S. SHISHODIA.

Conocephalus melaenus (DE HAAN, 1842)

Distribution: China to Sulawesi; previously not reported from India.

Localities: 1 ♂, Mizoram, Teirei, Dampa Sanct., 9.XI.1995, M.S. SHISHODIA; 1 ♂, Mizoram, Teirei, Aizawl, 24.X.1991, J.K. JONATHAN.

Pseudorhynchus crassiceps (DE HAAN, 1842)

Distribution: Oriental Region.

Locality: 1 ♀, Mizoram, Chungtlang, 18.IX.1993, A.R. LAHIRI.

Discussion. The Indo-Malayan species of *Pseudorhynchus* urgently need to be revised. The outline, origin and identity of several species is not certain.

Pseudorhynchus acuminatus REDTENBACHER, 1891

Distribution: Oriental Region.

Locality: 1 ♂, Mizoram, Teirei, Aizawl, 23.X.1991, J.K. JONATHAN.

Euconocephalus indicus (REDTENBACHER, 1891)

Distribution: Oriental Region.

Locality: 1 ♀, Mizoram, Teirei, Aizawl, 22.X.1991, J.K. JONATHAN.

Hexacentrus unicolor SERVILLE, 1831

Distribution: Oriental Region.

Localities: 1 ♀, Mizoram, Thinka, 18.IX.1993, A.R. LAHIRI; 1 ♂, Mizoram, Teirei, Aizawl, 24.X.1991, J.K. JONATHAN.

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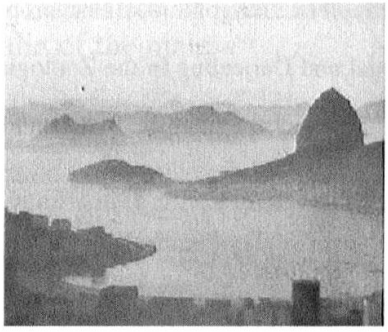

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