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## Orthoptera from Bhutan, Nepal, and North India in the Natural History Museum Basel

by Sigfrid Ingrisch

**Abstract.** A list of species of orthopterous insects is given, collected by the zoological expedition of the Natural History Museum Basel to Bhutan 1972 and additional collections in Nepal and North India. One subgenus and seven species are new to science: *Liotrachela megastyla* sp.nov. (Phaneropteridae); *Bhuxiphidiopsis* subgen.nov., *Xiphidiopsis* (*Bhuxiphidiopsis*) *microstyla* sp.nov. *Teratura* (*Stenoteratura*) *bhutanica* sp.nov. (Meconematinae); *Rhaphidophora angulata* sp.nov. (Rhaphidophoridae); *Schizodactylus brevinotus* sp.nov. (Schizodactylidae); *Truljalia lata* sp.nov. (Podoscirtidae); *Scapteriscus nepalicus* sp.nov. (Gryllotalpidae). The types of the new species and most of the other material is deposited in the Natural History Museum Basel.

**Key words.** Ensifera – Caelifera – Bhutan – Nepal – North India – new taxa – faunal list

### Introduction

The present study is mainly based on specimens of the zoological expedition of the Natural History Museum Basel to Bhutan in 1972 which was the first expedition to undertake systematic collection of orthopterous insects in this country. Only the Gryllacridoidea and Dermaptera of that expedition were so far identified and the results published (WÜRMLI 1973, BRINDLE 1975, SRIVASTAVA 1982). The majority of the orthopterous insects (namely Ensifera and Caelifera) remained unworked until today. Due to the long delay in studying the specimens, several species that were new by the time of collecting are meanwhile described from other areas of Southeastern Asia.

The paper is the first comprehensive systematic account on the Ensifera and Caelifera of Bhutan. 69 species were identified which belong to the following groups: 15 Tettigonioidea, 4 Gryllacridoidea, 31 Grylloidea, and 19 Caelifera. The list of species presented is certainly very incomplete as several regions of Bhutan, i.e. high altitudes in the north and the eastern part of the country were not accessible to the expedition (BARONI URBANI et al. 1973). Due to the season of the Bhutan expedition (May–June), crickets (Grylloidea) are well represented in the collection, while the number of species from other groups is rather low. Namely the Caelifera are under-represented.

Collections in other countries were sporadic. The list of orthopterous insects from Nepal contains 16 species (2 Gryllacridoidea, 10 Grylloidea, and 4 Caelifera). Material from North India comes mainly from Sikkim and Darjeeling, together 21 species (7 Tettigonioidea, 1 Gryllacridoidea, 11 Grylloidea, and 2 Caelifera), few specimens are from other areas. Reports on the orthopterous insects of Nepal are already published (CHOPARD & DREUX 1966, BEI-BIENKO 1968, INGRISCH 1987, 1990a, YIN & BALDERSON 1987, KEVAN & JIN 1993). The cricket fauna of Northeastern India was summarised by BHOWMIK (1986a) and VASANTH (1993), while comprehensive studies on the Caelifera of Northeastern India were made by BHOWMIK (1986b) on Acridoidea and by SHISHODIA (1991) on Tetrigidae.

Seven Ensifera species are new to science, five from Bhutan and two from Nepal. They belong to the following superfamilies: Tettigonioidea (3), Gryllacridoidea (2), Grylloidea (2).

### Material

Most of the specimens were jointly collected by C. Baroni Urbani, O. Stemmler, W. Wittmer and M. Würmli, and this is not stated in the following list of species. The localities of the Bhutan expedition are extensively described and drawn on a map in BARONI URBANI et al. (1973). Additional specimens were collected by several persons during succeeding expeditions to Bhutan, Nepal or North India. For those specimens, the name of the collector is given with the locality. All material is kept in the Natural History Museum Basel (NHMB) which is not explicitly stated except for the types of new species. I use the opportunity to add a few records of Ensifera collected by the late Dr. W. Thomas in Darjeeling. The latter specimens are in my own collection (CI). One paratype comes from the Zoological Survey of India, Calcutta (ZSI).

### Results

#### Order Ensifera

#### Superfamily Tettigonioidea

#### Family Phaneropteridae

##### *Phaneroptera gracilis* BURMEISTER, 1838

**Material examined.** BHUTAN: 1♀, Wangdi Phodrang 1300m, 7.VI.1972.

**Distribution.** Tropical regions from Africa to Australia.

##### *Letana linearis* WALKER, 1869

**Material examined.** BHUTAN: 2♂, Kharbandi 700m, IX.1975.

**Distribution.** Himalayan Range.

##### *Letana recticercis* CHOPARD & DREUX, 1966

**Material examined.** BHUTAN: 1♂, Wangdi Phodrang 1300m, 7.VI.1972.

**Distribution.** Previously known from Nepal and Darjeeling.

##### *Letana* sp.

**Material examined.** INDIA: 1 nymph, Himachal Pradesh, Godavari, 25.5.1977, lg. Wittmer, Brancucci.

***Himertula kinneari* (UVAROV, 1923)**

**Material examined.** BHUTAN: 1♀, Kharbandi 700m, IX.1975.

**Distribution.** Previously known from India and Nepal.

***Liotrachela megastyla* sp.nov. (Figs 1–6, 10)**

**Material examined.** Holotype ♂, BHUTAN: Phuntsholing, 200–400m, IX.1975, lg. Dorjee Khandu Dukpa (NHMB). Paratype 1♂, INDIA: East Sikkim, Ranipool, 14.IX.1993, lg. S. K. Saha (ZSI).

**Description.** Fastigium verticis narrower than scapus, conical, dorsally furrowed; separated from fastigium frontis by a deep groove. Pronotum with disc subflat but lateral angles rounded, transverse sulcus in the second half of the fourth tenth of pronotum length (28:74–28:77); anterior margin faintly concave, posterior margin rounded; paranota 1.2–1.3 times higher than long with anterior and posterior margins substraight and subparallel, the latter roundly curved in a circa 90° angle towards apical margin of pronotum. Prosternum unarmed; meso- and metasternal lobes angular. Tegmen large and broad, radius sector branching at about end of first third of tegmen length (Fig. 10). Hind wings caudate. Anterior coxa with a spine. Femora with the following number of spines on ventral margins: anterior femur 0 external, 4–6 internal; mesofemur 4–6 external, 0 internal; postfemur 6–7 external, 4 internal. Knee lobes of all legs obtuse. Tibial tympana conchate on internal, open on external side. Anterior tibia angular with dorsal and lateral surfaces flattened or very faintly furrowed, margins with the following number of spines: dorso-external 1–2+1 apical spur, dorso-internal without spines and spur, ventro-external 3+1 apical spur, ventro-internal 3–4+1 apical spur. Mesotibia with 5 spines and 1 apical spur on dorso-internal margin, dorso-external margin unarmed and apical spur absent. Posttibia with 1 dorsal and 2 ventral apical spurs at each side.

Male. Tegmen with stridulatory area narrow-elongate with stridulatory vein and following vein bulging (Fig. 1). Stridulatory file with about 70 teeth (Fig. 6). Tenth abdominal tergite with apical area curved ventrad, not prolonged, apical margin subtruncate (Figs 2–3). Epiproct triangularly rounded, rather flat. Cerci conical, slightly curved, near apex strongly curved, apex broad-obtuse and provided with a minute tooth (Fig. 5). Subgenital plate elongate with lateral margins gradually narrowing towards apex, lateral areas upcurved in a circa 90°-angle to almost apex, with a narrow medial and two rounded lateral carinae; apex hardly excised in middle; styli stout (Figs 3–4).

Female unknown.

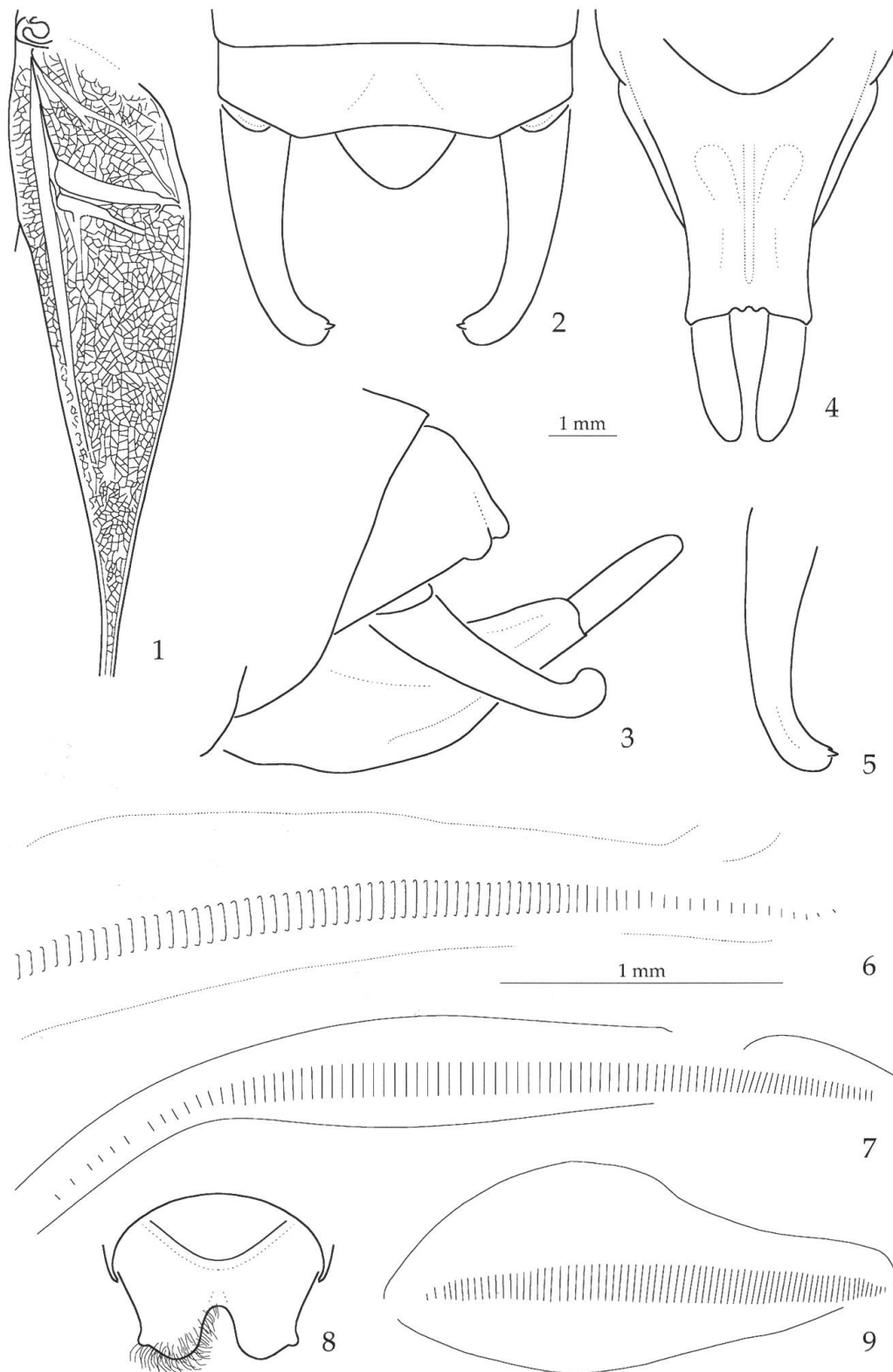
Coloration. Uniformly dirty yellowish brown, probably green when alive.

Measurements of males (length in mm): body 28–31; pronotum 9.5–10.0; tegmen 54–58; tegmen-width 17–18; hind wing projecting 6; anterior femur 8–9; mesofemur 11; postfemur 27; posttibia 29.5.

**Distribution.** Bhutan, East Sikkim.

**Differential diagnosis.** The new species resembles superficially large species of *Holochlora*, but differs from that genus by the tenth abdominal tergite in males which is not prolonged behind into two lobes. *L. megastyla* comes close to *Liotrachela hyalina* (KARNY, 1925) [described under *Parapsyra* and moved to *Liotrachela* by KARNY (1926)]





**Figs 1–9.** *Liotrachela megastyla* sp.nov. ♂ (holotype; 3, paratype): 1, stridulatory area of left tegmen; 2, apex of abdomen in dorsal view; 3, do. lateral view; 4, subgenital plate; 5, left cercus; 6, stridulatory file. *Khaoyaiana nitens* INGRISCH, 1990 ♂ (Wangdi Phodrang): 7, stridulatory file. *Holochlora nigrotympana* INGRISCH, 1990 ♂ (Samchi): 8, tenth abdominal tergite; 9, stridulatory file.

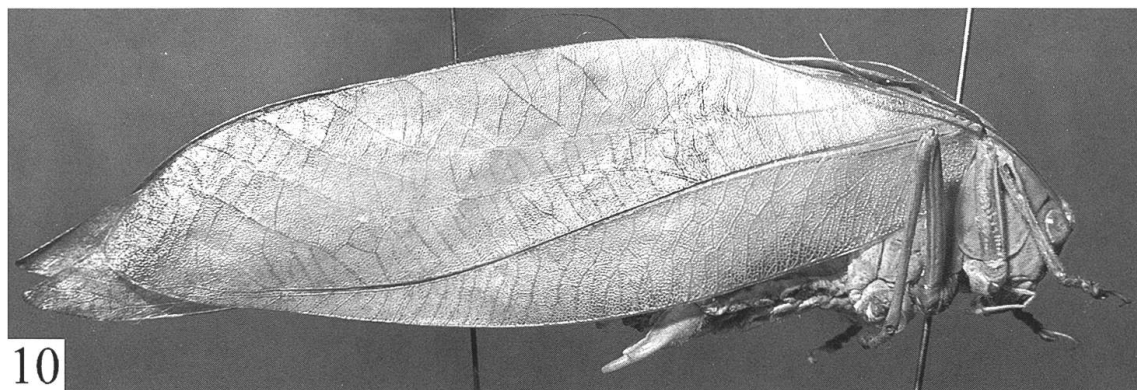


Fig. 10. *Liotrachela megastyla* sp.nov. ♂ (holotype).

known from Malaysia and Java. It differs by much larger size of pronotum and wings for similar size of legs, by the cerci not clavate at apex, the subgenital plate more gradually narrowing towards apex and only indistinctly excised. Most *Liotrachela* species live in the Philippines (KARNY 1926). The new species is the westernmost record for the genus. There are two groups of species. In the first group (including the typus generis), the male subgenital plate is without styli, while in the second group (including *L. hyalina* and the new species), styli are present. It is thus possible that the genus is heterogeneous and needs to be divided. However, a revision is necessary to decide on this subject.

**Name derivation.** The name refers to the large styli.

***Holochlora nigrotympana* INGRISCH, 1990**

(Figs 8–9)

**Material examined.** BHUTAN: 2♂, Samchi, 350–450m, 7.–11.V.1972.

**Distribution.** Previously known from Thailand.

**Remarks.** *H. nigrotympana* was described from Central Thailand. The specimens at hand differ slightly by the shape of the male tenth abdominal tergite which is gradually sloping to the apex (without step-like declination), the preapico-ventral projection is stouter and pointing more ventrad (instead of strongly craniad) (Fig. 8). The stridulatory file and the number of stridulatory pegs are identical with individuals of *H. nigrotympana* from Thailand (recently described in HELLER et al. 1997), the stridulatory vein is slightly more bulging (Fig. 9).

***Khaoyaiana nitens* INGRISCH, 1990**

(Fig. 7)

**Material examined.** BHUTAN: 1♂, Wangdi Phodrang 1300m, 7.VI.1972.

**Distribution.** Previously recorded from Thailand and China (INGRISCH 1990b, JIN & XIA 1994).

**Remarks.** The species was described from Central Thailand. The specimen at hand is slightly smaller but otherwise agrees completely with topotypic material. The

stridulatory file (figured here for the first time) carries 88 teeth and agrees completely with topotypic material (Fig. 7).

***Isopsera pedunculata* BRUNNER, 1878**

**Material examined.** INDIA: 1♂, Darjeeling, Manjitar, 30.VI.1987, lg. W. Thomas (CI).

**Distribution.** Described from Rangoon, Calcutta and Assam.

**Family Pseudophyllidae**

***Pseudophyllus ligatus* (BRUNNER, 1895)**

**Material examined.** BHUTAN: 1♂, Wangdi Phodrang 1300m, 7.VI.1972; 1♀, Timphu 2400–2500m, 31.V.1972. INDIA: 1♀, Sikkim, Lage Shap - Reshi, 500–600m, 4.IV., lg. B. Bhakta.

**Distribution.** Previously only known from Sikkim.

***Sathrophyllia rugosa* (LINNAEUS, 1758)**

**Material examined.** BHUTAN: 1♀, Phuntsholing 200–600m, VI.1972. INDIA: 1♀, Meghalaya, Darugiri, Garo Hills, 19.V.1976, lg. Wittmer & Baroni Urbani; 1♀, Darjeeling, Jhepi, 13–1400m, 22.V.1975, lg. W. Wittmer; 1 nymph (♂ last instar), Darjeeling, Kamsi Forest, 930m (Kalimp.), 27.IV.1986, lg. B. Bhakta; 14.III.1977; 1 nymph (♀ last instar), Darjeeling, Durpin, 1200m, 10.VIII.1985, lg. C.J. Rai.

**Distribution.** Oriental Region.

***Sanaa regalis* BRUNNER, 1895**

**Material examined.** INDIA: 1♀, Darjeeling, Kalimpong 1300m, Grames Homes, VIII./IX.1983, lg. C.J. Rai.

**Distribution.** Previously only known from Sikkim.

**Family Mecopodidae**

***Mecopoda elongata* (LINNAEUS, 1758)**

**Material examined.** BHUTAN: 1♂, Phuntsholing, 200–400m, IX.1975. INDIA: 1♀, Meghalaya, Darugiri, Garo Hills, 450m, lg. Wittmer & Baroni Urbani, 19.V.1976; 1♀, Kalimpong, VI.1976, lg. B. Bhakta.

**Distribution.** Oriental Region.

**Family Tettigoniidae**  
**Subfamily Meconematinae**  
**Tribe Xiphidiopsini**

***Xiphidiopsis* REDTENBACHER, 1891**

**Remarks.** The genus *Xiphidiopsis* as formerly understood, is a formal genus assembling numerous species which are not always related in a phylogenetic point of view. The African genera of the tribe Xiphidiopsini *sensu* OTTE (1997) were revised by BEIER (1965), while GOROCHOV (1993) proposed 8 new genera and 12 new subgenera mainly from Asia. The material at hand comprises three species; two of them can be arranged with subgenera outlined in GOROCHOV (1993), while for the third species a new subgenus is proposed here.

***Bhuxiphidiopsis* subgen.nov.**

**Typus subgeneris:** *Xiphidiopsis* (*Bhuxiphidiopsis*) *microstyla* sp.nov.

**Diagnosis.** The new subgenus shows a similar modification of the male subgenital plate as the subgenus *Dinoxiphidiopsis* GOROCHOV, 1993. It differs as follows: The tegmen are only reaching the apical area of the postfemur (not the apical area of the posttibia); the last abdominal tergite of males is unmodified; the male subgenital plate is still provided with remnants of styli. From other subgenera of *Xiphidiopsis* it differs by the unmodified last abdominal tergite of males, rather simple cerci, and the modification of the male subgenital plate with a medial process and the styli reduced to small tubercles.

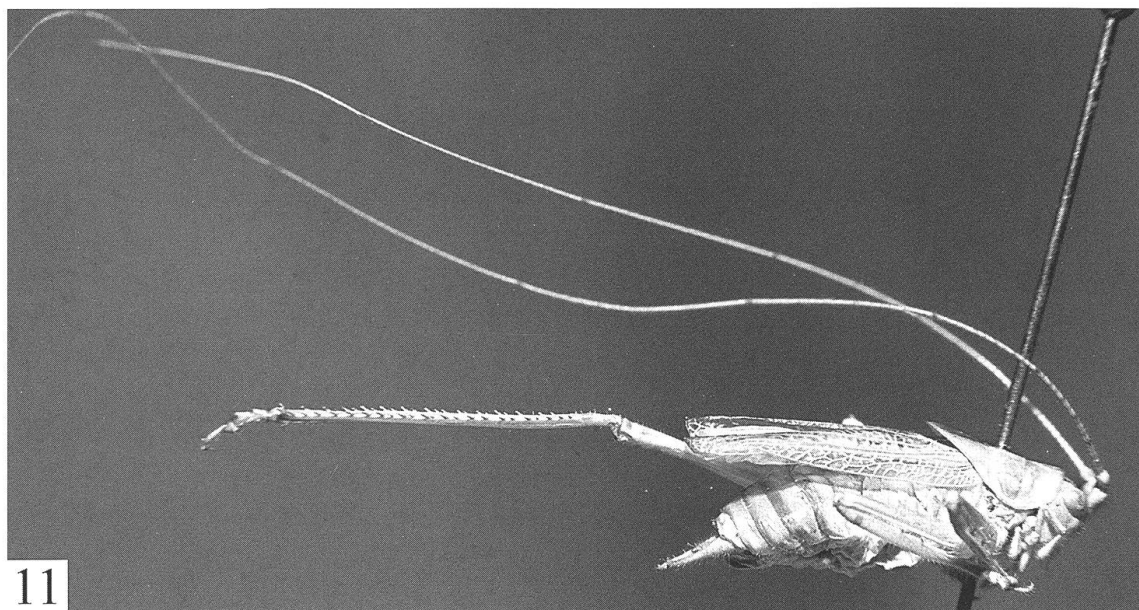
**Other characters.** Thoracic auditory spiracle larger than first stigma, not covered by pronotum (Fig. 17). Hind wings not surpassing tegmina. Phallus membranous.

**Name derivation.** The name of the new subgenus is derived by adding the first syllable of Bhutan to the generic name *Xiphidiopsis*.

***Xiphidiopsis* (*Bhuxiphidiopsis*) *microstyla* sp.nov.** (Figs 11, 14–17)

**Material examined.** Holotype ♂, BHUTAN: Tongsa, 2150m, 24.VI.1972 (NHMB).

**Description.** Head with compound eyes protruding anteriorly; fastigium verticis conical, dorsally furrowed, apex obtuse. Pronotum prolonged behind and covering stridulatory area of tegmen; disc slightly flattened especially in posterior area but lateral margins rounded into paranota; with a faint indication of a medial carina in posterior area; transverse sulcus only faintly indicated; anterior margin subtruncate, posterior margin rounded; humeral sinus absent (Fig. 17). Thoracic auditory spiracle large (height 0.45 mm, width 0.16 mm), kidney-shaped, completely free. Prosternum unarmed; meso- and metasternum hardly lobate. Tegmen slightly abbreviated, covering abdomen but not reaching apex of postfemur; hind wings of the same length (Fig. 11). Anterior coxa with a large dorsal spine. Knee lobes of all legs obtuse. Anterior tibia slightly widened at



**Fig. 11.** *Xiphidiopsis* (*Bhuxiphidiopsis*) *microstyla* sp.nov. ♂ (holotype).

tympana which are open on both sides; with 4 spines and 1 small apical spur on both ventral margins. Mesotibia slightly compressed and widened except in apical third; with 5 ventro-external and 4 ventro-internal spines and 1 apical spur at both sides.

Male. Tenth abdominal tergite transverse, apical margin slightly sinuate (Fig. 14). Epiproct triangular, disc grooved, apex subacute. Cerci conical, curved in apical half, apex subacute; in circa basal half with internal surface grooved, on ventral margin at very base with a small, obtuse, hook-shaped projection and on dorsal margin with a large, compressed, acute triangular projection with obtuse apex (Figs 14–15). Subgenital plate semicircular but apical margin with a narrow medial projection of about same length as subgenital plate; projection with a medial carina, sloping lateral areas and apex rounded (Fig. 16). Styli reduced to small tubercles on ventral surface near apex of projection.

Female unknown.

Coloration. Uniformly yellowish brown (discolored, probably green when alive). Antennae annulated. Vertex with 4 brown lines. Disc of pronotum with a broad brown medial band. Tegmen subtransparent with brownish cells and whitish veins; dorsal margin brown. Tenth abdominal tergite white with a brown triangular spot in middle.

Measurements of male (length in mm): body 9; pronotum 3.3; tegmen 7.0; postfemur 8.0; cerci 2.0.

**Distribution.** Bhutan.

**Differential diagnosis.** The modification of the male subgenital plate of the new species is somewhat similar to that of *X. (Dinoxiphidiopsis) jacobsoni* GOROCHOV, 1993, but the basal area is relatively larger, the medial process stouter and much shorter. Other differences are already outlined under the subgenus.

**Name derivation.** The name refers to the reduced styli.

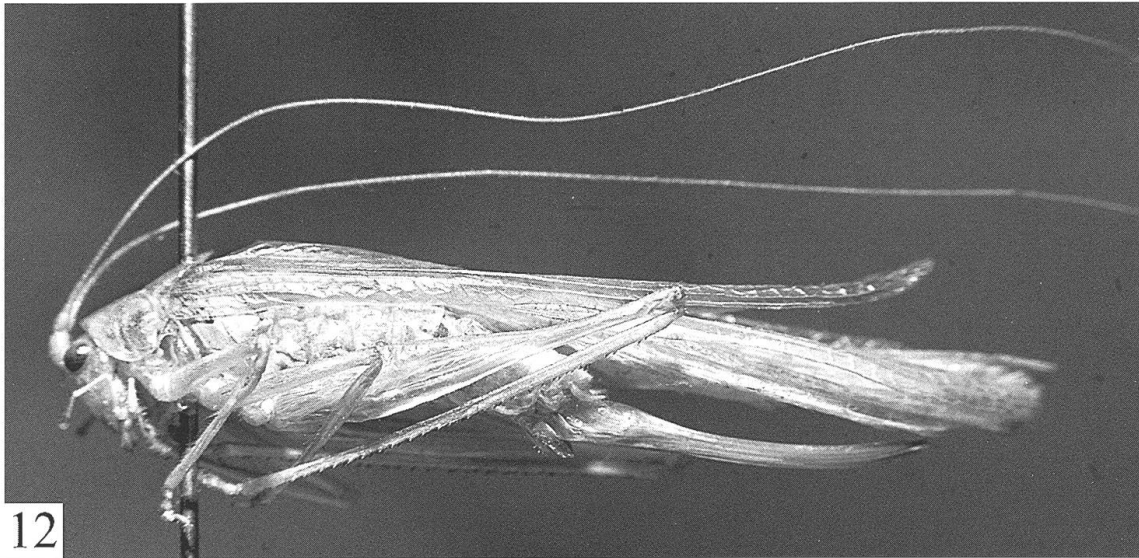


Fig. 12. *Teratura* (*Stenoteratura*) *bhutanica* sp.nov. ♀ (holotype).

***Teratura* (*Stenoteratura*) *bhutanica* sp.nov.** (Figs 12, 18–20)

**Material examined.** Holotype ♀, BHUTAN: Changra, 18 km S of Tongsa, 1900m, 22.VI.1972 (NHMB).

**Description.** Fastigium verticis conical, dorsally furrowed, apex obtuse. Pronotum prolonged behind and covering base of tegmen; disc rounded into paranota but posterior area flattened and shouldered; transverse sulcus indicated as a small U-shaped furrow on disc, with a substraight second transverse furrow delimiting the flattened posterior part from rest of disc; anterior margin substraight in middle, posterior margin angularly rounded; humeral sinus indicated by a rounded-angular bend. Thoracic auditory spiracle large (height 0.85 mm, width 0.36 mm), completely free (Fig. 18). Prosternum unarmed; meso- and metasternum hardly lobate. Tegmen reaching about apex of ovipositor; hind wings caudate (Fig. 12). Anterior coxa with a spine. Knee lobes of all legs obtuse at both sides. Tibial tympana free at both sides, tibia slightly widened at tympana. Anterior and medial tibiae with 3–4 spines and 1 apical spur at both ventral margins.

Male unknown.

Female. Tenth abdominal tergite transverse. Epiproct short, semicircular with a medial furrow. Cerci conical, curved (Fig. 19). Subgenital plate with a long, compressed, apico-lateral projection at each side, projections with acute apex; central part of subgenital plate with apex broadly obtuse-angular with tip rounded (Figs 19–20). Ovipositor long, substraight, in apical half faintly curved dorsad; ventral valves at base of dorsal margin with a slightly curved, spiniform projection (Fig. 19).

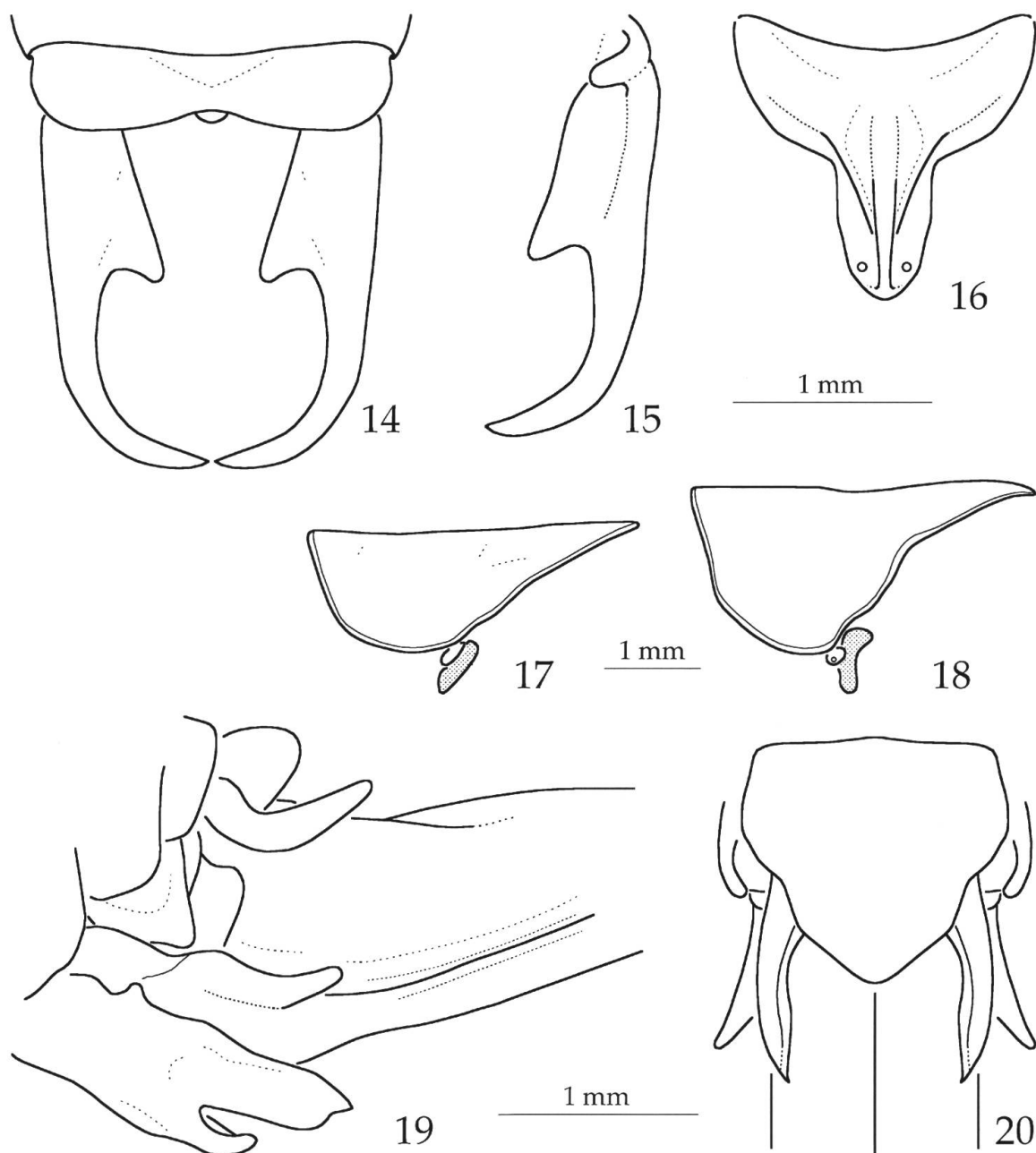
Coloration. Uniformly yellowish brown (discolored, probably green when alive).

Measurements of female (length in mm): body 12.5; pronotum 3.3; tegmen 23.5; hind wings projecting 3.5; anterior femur 3.5; postfemur 10.0; ovipositor 9.5.

**Distribution.** Bhutan.

**Differential diagnosis.** The new species comes close to *T. (S.) yunnanea* (BEI-BIENKO, 1957) and *T. (S.) kryzhanovskii* (BEI-BIENKO, 1957). It differs from *T. yunnanea* by the





**Figs 14–20.** *Xiphidiopsis* (*Bhuxiphidiopsis*) *microstyla* sp.nov. ♂ (holotype): 14, apex of abdomen dorsal; 15, left cercus in ventral view; 16, subgenital plate; 17, pronotum and auditory spiracle. *Teratura* (*Stenoteratura*) *bhutanica* sp.nov. ♀ (holotype): 18, pronotum and auditory spiracle; 19, apex of abdomen and base of ovipositor in lateral view; 20, subgenital plate and base of ovipositor in ventral view.

ovipositor which has a baso-lateral appendix and from *T. kryzhanovskii* by the baso-lateral appendix of the ovipositor being narrower. Common with both species, the subgenital plate is fissing into a central and two lateral lobes. It differs by the lateral lobes being constricted before apex (not gradually tapering to apex as in *T. kryzhanovskii* or subacute and curved mediad as in *T. yunnanea*). It also differs from both species by the cerci having the apex obtuse (not acute).

**Name derivation.** The name is derived from the country of origin.

***Teratura (Teratura) maculata* INGRISCH, 1990**

**Material examined.** NEPAL: 1♀, Janakpur, Dolakha, Tama Koshi 850–110m, 24.–29.V.1989, lg. M. Brancucci.

**Distribution.** Known from Nepal and Darjeeling.

**Subfamily Conocephalinae**

**Tribe Conocephalini**

***Conocephalus maculatus* (LE GOUILLOU, 1841)**

**Material examined.** BHUTAN: 1♂, Phuntsholing 200–600m, 15.IV.1972; 1♀, Wangdi Phodrang 1300m, 7.VI.1972.

**Distribution.** Tropical regions from Africa to Australia.

***Conocephalus bambusanus* INGRISCH, 1990**

**Material examined.** INDIA: 1♀, Darjeeling, Manjitar, 30.VI.1987, lg. W. Thomas (CI).

**Distribution.** Previously known from Thailand.

**Tribe Agraeciini**

***Palaeoagraecia brunnea* INGRISCH, 1998**

**Material examined.** BHUTAN: 2♀, Wangdi Phodrang, 1300m, 7.VI.1972. INDIA: 1♀, Darjeeling, Lebong, 16–1800m, 2.VI.1975, lg. W. Wittmer.

**Distribution.** North India to Malaysia.

**Tribe Copiphorini**

***Pyrgocorypha subulata* (THUNBERG, 1815)**

**Material examined.** BHUTAN: 1♀, Wangdi Phodrang, 1300m, 7.VI.1972.

**Distribution.** Oriental Region.



**Superfamily Gryllacridoidea**  
(= Stenopelmatoidea)

**Family Gryllacrididae**

***Diaphanogryllacris aequalis* (WALKER, 1859)**

**Material examined.** NEPAL: 1♂, Danda Pakhar, 1600–2500m, 2.VI.1977, lg. M. Brancucci.

**Distribution.** Reported from Sri Lanka, Assam and Nepal. The specimen at hand agrees with the diagnosis given by BEI-BIENKO (1968).

**Family Anostomatidae**

***Paterdecolyus panteli* GRIFFINI, 1913**

syn. *Anapropsis griffini* KARNY, 1930: JOHNS (1997)

**Material examined.** INDIA: 1♂, Darjeeling, 2150m, 26.V.1975, lg. W. Wittmer.

**Distribution.** Known from Northeast India. Already recorded from Bhutan by WÜRMLI (1973).

***Paterdecolyus dubius* WÜRMLI, 1973**

**Remarks.** Described from Bhutan by WÜRMLI (1973).

**Family Rhaphidophoridae**

***Diestrammena tsongkhapa* WÜRMLI, 1973**

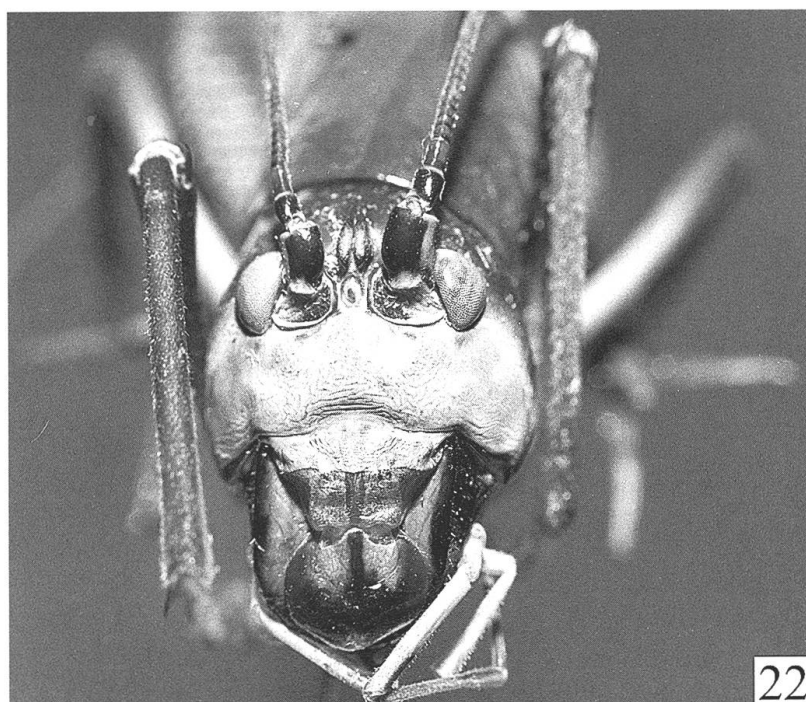
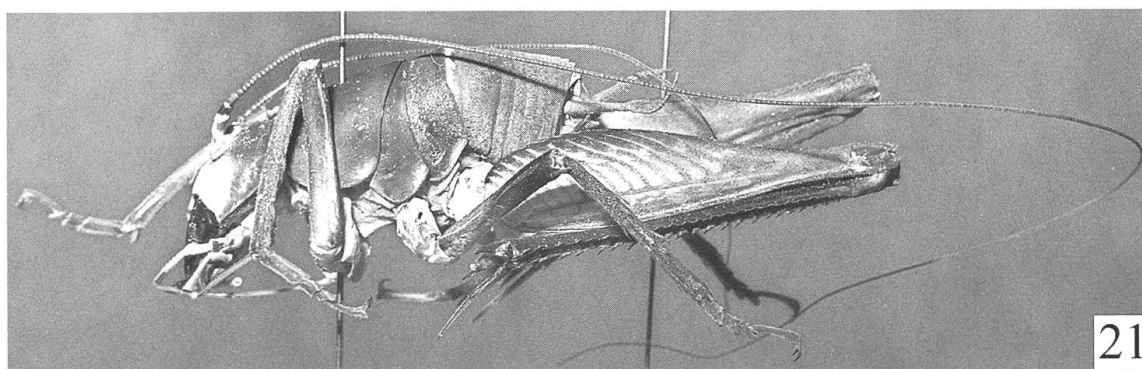
**Remarks.** Described from Bhutan by WÜRMLI (1973).

***Rhaphidophora angulata* sp.nov.**

(Figs 21–22, 26–27)

**Material examined.** Holotype ♂, BHUTAN: Kharbandi, 700m, VIII.1975, lg. Dorjee Khandu Dukpa (NHMB).

**Description.** Fastigium verticis compressed, projecting, deeply furrowed in midline, separated by a shallow furrow from fastigium frontis (Fig. 22). Frons grooved at clypeo-frontal suture. Mandibles with an angular, carinated, longitudinal fold separating an anterior from a lateral surface, both surfaces slightly concave and standing in a circa 90°-angle on each other. Palpi long and thin, segments increasing in length from first to last segment. Pronotum funnel-shaped, anterior margin subtruncate in middle, posterior margin broadly rounded, ventral margin rounded. Postfemur stout. Knee lobes of anterior femur with a long spine on internal side, unarmed on external side; of medial femur with a long spine on both sides; of postfemur with a short spine on internal lobe, external lobe unarmed. Tibiae with the following number of spines + apical spurs:



**Figs 21–22.** *Rhaphidophora angulata* sp.nov. ♂ (holotype): 21, habitus; 22, frons.

anterior tibia 0 dorsal, 2+1 ventro-external, 1+1 ventro-internal; mesotibia 2+1 on both dorsal margins, 3+1 ventro-external, 1+1 ventro-internal; posttibia 22–24+1 dorso-external, 20–22+1 dorso-internal, 0+2 on both ventral margins; the dorso-apical spurs of postfemur very large. First segment of posttarsus dorsally carinate with 4 spinules and terminating in a long acute spine surpassing apex of second tarsal segment.

Male. Ninth abdominal tergite only laterally visible in specimen at hand, dorsal part hidden under eighth tergite; tenth tergite short, transverse, apical margin at both sides very shortly, obtuse-angularly projecting, broadly subtruncate in between. Epiproct large (Fig. 26), acute-triangular with apex rounded; disc carinated all around, only at apex carina cut by a furrow; lateral surfaces of epiproct high and with a longitudinal furrow, at apex projecting behind elevated disc and with 2 obtuse dorsal swellings, behind these swellings deeply sloping; base of lateral surfaces of epiproct covered by a short tongue-shaped fold (and only on left side with a tubercle laterad of that fold = artefact?).

Paraproctes membranous. Cerci moderately long. Subgenital plate sclerotised at both sides, membranous in middle, with two slightly curved styli which are slightly longer than subgenital plate (Fig. 27).

Female unknown.

Coloration. Dark reddish brown from above, yellowish brown from beneath. Head with vertex and antennae dark brown, frons yellowish, ventral part of labrum brown with 2 yellowish brown spots at base and a black spot behind middle; mandibles with anterior surface yellowish brown, lateral surface, angle and apex black. Pro-, meso- and metanotum with a small yellowish spot at ventro-posterior angle. Coxae and basal areas of pro- and mesofemur yellowish brown; postfemur striated, otherwise legs dark brown.

Measurements of male (length in mm): body 25; head height 11.0; pronotum 9.3; anterior femur 11.0; mesofemur 11.5; postfemur 26.5; posttibia 24.0; cerci 8.0.

**Distribution.** Bhutan.

**Differential diagnosis.** The new species is characterised by the carinate mandibles. It is similar to *R. bicornuta* KARNY, 1937 (described from Assam) with regard to the shape of the ninth abdominal tergite, subgenital plate, size and coloration. It differs – apart from the carinate mandibles – by the specific shape of the epiproct (apex not angularly excised nor with two acute projections). From other, less closely related *Rhaphidophora* species the new species differs as follows: From *R. deusta* BRUNNER, 1888 (Indochina) by the styli which are simple (not two-pointed); from *R. acutelaminata* CHOPARD, 1916 (Burma) and *R. mulmeiensis* CHOPARD, 1916 (Burma) by the distinct shape of the last abdominal tergites and epiproct and by the styli being long-cylindrical and slightly curved (not ovoid and short); from *R. rufobrunnea* CHOPARD, 1921 (Shan States, now Myanmar) by completely different coloration, the long (not short) mouthparts, the carinated mandibles and by different abdominal terminalia.

WÜRMLI (1973) records two *Rhaphidophora* nymphs from Bhutan.

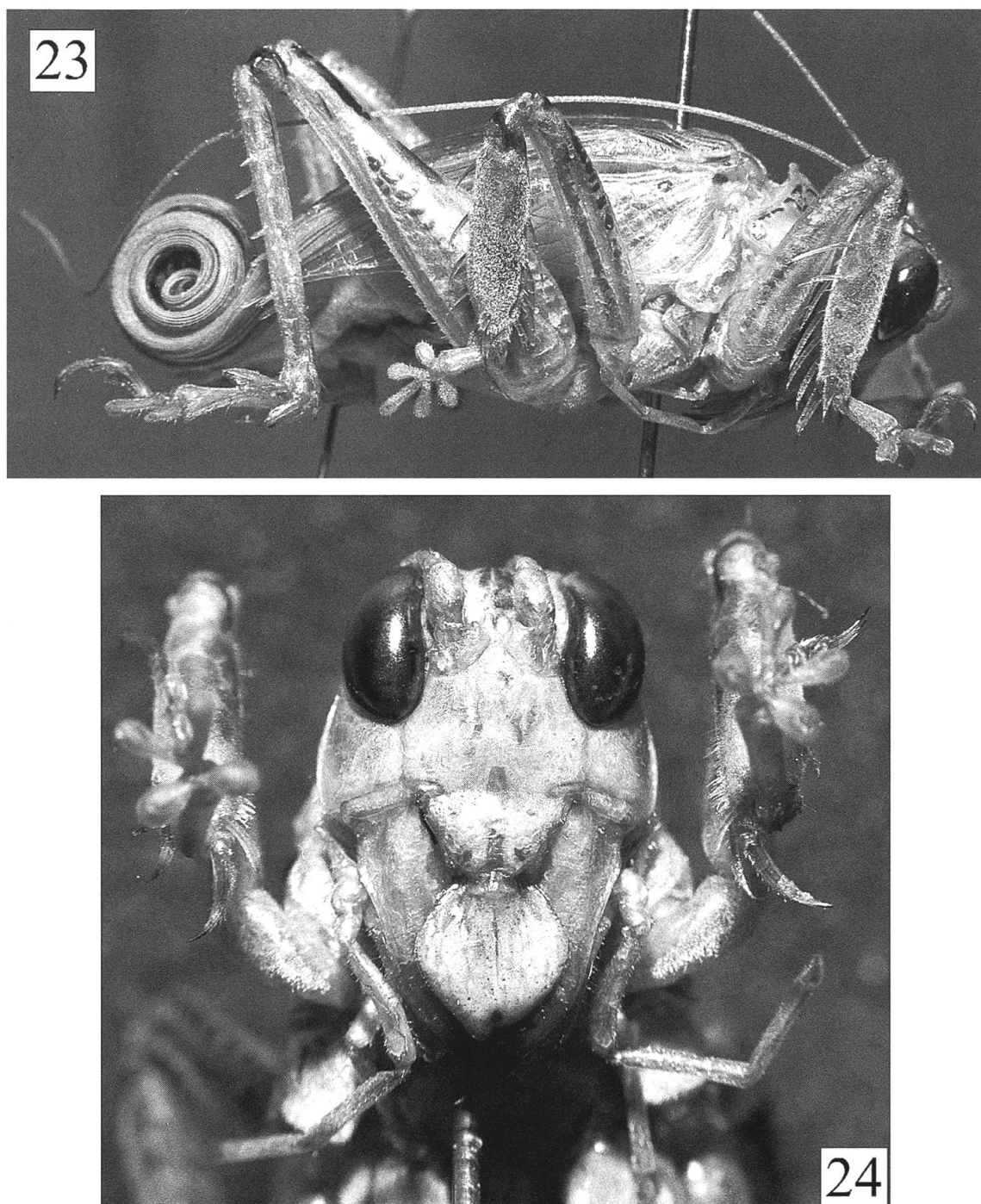
**Name derivation.** Named after the angular mandibles, a striking character of the new species.

## Family Schizodactylidae

### *Schizodactylus brevinotus* sp.nov. (Figs 23–24, 28–32; Addendum 53–57)

**Material examined.** Holotype ♀, NEPAL: East Nepal, Mechi, Dobhan, 700m, 7.VI.1985, lg. M. Brancucci (NHMB). 1 paratype ♂, NEPAL: E-Nepal, Koshi, Lumbughat-Baiseghat, 450 m, 15.VI.1985 (NHMB) [see Addendum for details to this specimen].

**Description.** Frons long-ovoid; vertex vaulted, steeply sloping between compound eyes; fastigium verticis small, deeply furrowed, lying between dorsal margins of antennal scrobae; margins of antennal scrobae elevated (Fig. 24). Mandibles long, its lateral margins sinuate: convex near base, concave in middle, and convex again in apical half; apex subacute, black. Pronotum transverse, very short, gradually curved from one side to the other; anterior margin concave, lateral margins sinuate, posterior margin broadly concave and sinuate; transverse sulcus just behind anterior margin (Fig. 32). Tegmen and wings greatly surpassing body, spirally rolled up at end (Fig. 23). Anterior femur with



**Figs 23–24.** *Schizodactylus brevinotus* sp.nov. ♀ (holotype): 23, habitus; 24, frons.

3–6 minute spinules on ventro-internal margin; medial femur with 6–9 spinules on ventro-external margin; postfemur with 12–20 minute spinules on both ventral margins. Knee lobes of all legs obtuse. Anterior tibia with 4 long ventro-external and 4 long ventro-internal spines (partly broken in specimen at hand) and with 2 apical spurs at each side, the internal spurs longer than the external ones, the ventro-internal spur the longest

one. Mesotibia with 4 long ventro-external and 3–4 short ventro-internal spines, 4 long dorso-internal spines and 1 shorter dorso-external spine just above the apical spurs; 2 apical spurs at each side, the internal spurs longer than the external ones, the dorso-internal spur being the longest one. Posttibia with 3 dorso-external and 4 dorso-internal spines of medium length; with 3 apical spurs at each side, the internal spurs longer than the external ones; of these spurs, 1 external and 2 internal ones distally widened (Figs 30–31); ventro-apical margin of posttibia with 4 short spines just below apical spurs and with 1 longer spine at internal angle. Tarsi of all legs with 4 segments and a pair of apical claws, 2nd and 3rd segment very short and provided each with a pair of large plantulae; first segment of hind tarsus with a pair of large, compressed, triangular lateral projections.

Male see Addendum.

Female. Last abdominal tergite short, transverse, subfused with epiproct; epiproct triangular, furrowed in midline, apex obtuse. Cerci compressed, especially in apical area, with a conical basal and a digitiform apical area, apex obtuse (Figs 28–29). Subgenital plate simple, apex broadly rounded (Fig. 29). Ovipositor greatly reduced but remnant surpassing apex of subgenital plate (Figs 28–29).

Coloration. Yellowish brown. Compound eyes dark brown, vertex with 5 interrupted dark brown longitudinal bands, the most lateral bands dissolved into dots. Pronotum with dark brown ornaments (Fig. 32). Tegmen in dorsal area near base with brownish cells and yellowish venation, otherwise yellowish transparent, humeral angle with a brown stroke. Anterior femur with a brown band on dorso-internal, meso- and postfemora on dorso-external margin, the latter with some brown spots on lateral surface. Anterior and mesotibiae with a subbasal brown spot; posttibia with genicular area brown.

Measurements of female (length in mm): body 25; pronotum in middle 2.2; pronotum at the sides 3.8; pronotum width 8.2; anterior femur 9.0; mesofemur 9.5; postfemur 16.0; posttibia 13.5; ovipositor 1.0.

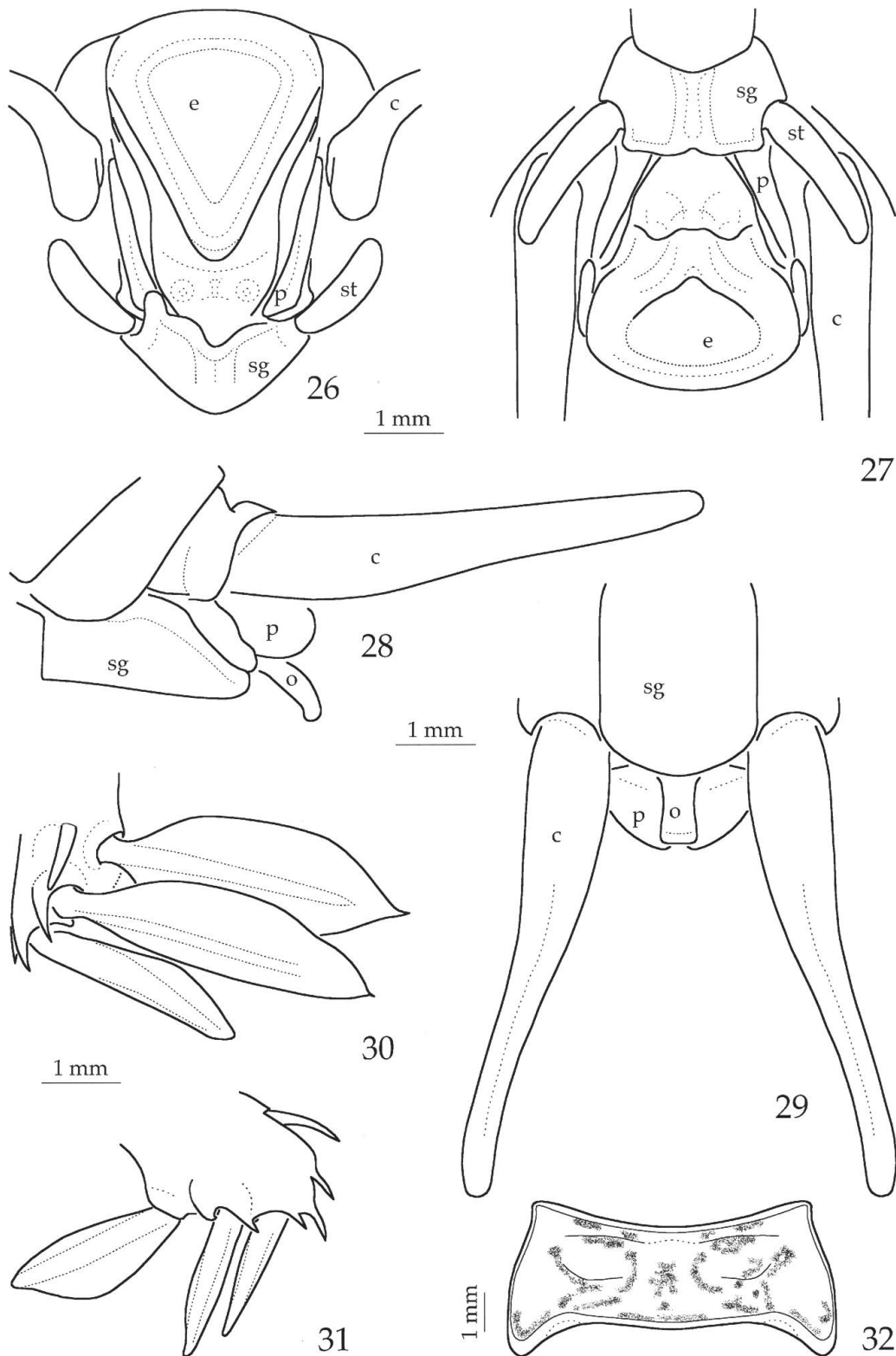
**Distribution.** East Nepal.

**Differential diagnosis.** Previously, six species of the genus *Schizodactylus* were described. *S. brevinotus* differs from all of them by the very short pronotum. Further differences are found in the female subgenital plate which is more rounded than in *S. burmanus* UVAROV, 1935 and less rounded than in *S. monstrosus* DRURY, 1773. The new species differs also by the shape of the tibial spurs from both of these species as well as from *S. minor* ANDER, 1938 and *S. tuberculatus* ANDER, 1938 (both only known in the male sex). From *S. hesperus* BEI-BIENKO, 1967, the new species differs by the shape of the spurs of the posttibia and the ovipositor which is not strongly curved and has the apex truncate (not rounded). *S. inexpectatus* WERNER, 1901 differs from other *Schizodactylus* species by the abbreviated wings.

BEI-BIENKO (1968) records one nymph of an undetermined *Schizodactylus* species from eastern Nepal which might belong to the new species.

**Name derivation.** Named after the short pronotum.





**Figs 26–32.** *Rhaphidophora angulata* sp.nov. ♂ (holotype): 26, apex of abdomen in apical view; 27, do. in ventral view. *Schizodactylus brevinotus* sp.nov. ♀ (holotype): 28, apex of abdomen in lateral view; 29, do. in ventral view; 30, apex of posterior tibia internal view; 31, do. external view; 32, pronotum. Abbreviations: c = cercus, e = epiproct, p = paraproct, st = stylus, sg = subgenital plate, o = ovipositor.

## Superfamily Grylloidea

### Family Gryllidae

#### Subfamily Gryllinae

#### *Brachytrupes (Tarbinskiellus) portentosus* (LICHTENSTEIN, 1796)

**Material examined.** BHUTAN: 2♂, 11♀, Samchi, 350–450m, 7.–11.V.1972; 1♂, Phuntsholing, VI.1972; 2♂, 2♀, Phuntsholing, 200–400m, 14.V.1975, lg. Dorjee Khandu Dukpa.

**Distribution.** Oriental Region except Sunda islands.

#### *Gryllus bimaculatus* (DE GEER, 1773)

**Material examined.** BHUTAN: 2♂, 2♀, 3 nymphs, Timphu, 2440m, 20.IV.1972; 2♂, 6♀, Timphu, 29.IV.1972; 5♂, 4♀, Timphu, 31.V.1972; 1♂, 3♀, Samchi, 350–450m, 7.–11.V.1972; 3♀, Wangdi Phodrang, 1300m, 7.VI.1972; 1♂, 1♀, 5 nymphs, Paro, 2300m, VI.1972; 1♀, Phuntsholing, 200–400m, 6.V.1972. NEPAL: 1♀, Janakpur, Dolakha, Tama Koshi, 850m–1100m, 24.–29.V.1989, lg. M. Brancucci; 1♀, East Nepal, Koshi, Hile - Mutidhunga 2–2200m, 27.V.1985, lg. M. Brancucci. INDIA: 2♀, Darjeeling, Tiger Hills, 2150m, 7.V.+6.VI.1975, lg. W. Wittmer; 1♀, Assam, Kaziranga, 75m, 7.–9.V.1976, lg. W. Wittmer, Baroni Urbani.

**Distribution.** South Europe, Africa, tropical Asia.

#### *Teleogryllus occipitalis* (SERVILLE, 1838)

**Material examined.** BHUTAN: 1♂, Timphu 29.IV.1972; 2♂, 3♀, Timphu, 27–29.VI.1972; 2♀, Khala 200m, 25.IV.1972; 2♂, 1♀, Samchi, 350–450m, 7.–11.V.1972; 1♀, Wangdi Phodrang, 1300m, 7.VI.1972; 3♂, 2♀, 1♀ nymph, Changra 18 km S. Tongsa, 1900m, 22.VI.1972. NEPAL: 1♂, Bagmati, Dolakha, Tama Koshi, 850–1100m, 24.–29.V.1989, lg. M. Brancucci; 1♂, East Nepal, Koshi, Hile - Mutidhunga 2000–2200m, 27.V.1985, lg. M. Brancucci. INDIA: 1♀, Darjeeling, Jhepi, 17.V.1975, lg. W. Wittmer.

**Distribution.** Oriental Region.

#### *Teleogryllus mitratus* (BURMEISTER, 1838)

**Material examined.** BHUTAN: 3♀, Samchi, 350–450m, 7.–11.V.1972; 1♀, Timphu river 2300m, 29.IV.1972.

**Distribution.** Oriental Region.

#### *Loxoblemmus detectus* (SERVILLE, 1838)

**Material examined.** BHUTAN: 2♀, Samchi, 350–450m, 7.–11.V.1972.

**Distribution.** India to Malaysia.

#### *Loxoblemmus equestris* SAUSSURE, 1877

**Material examined.** BHUTAN: 1♂, 2♀, Darugiri, Garo Hills, 450m, 19.V.1972; 1♀, 21/1; 1♀, Samchi, 350–450m, 7.–11.V.1972. NEPAL: 1♂, East Nepal, Koshi, Basantapur, 2300m, 30.V.–2.VI.1985, lg. M. Brancucci.

**Distribution.** Oriental Region (India to Sulawesi).

***Loxoblemmus nigriceps* CHOPARD, 1933**

**Material examined.** BHUTAN: 1♂, Wangdi Phodrang, 1300m, 25.–26.VI.1972; 1♀, no. 38; 3♀, Changra 18 km S. Tongsa, 1900m, 22.VI.1972; 2♂ Changra, 18 km S. Tongsa, 1900m, 22.VI.1972.

**Distribution.** India: Sikkim and Uttar Pradesh (BHOWMIK 1985).

***Modicogryllus siamensis* CHOPARD, 1961**

**Material examined.** BHUTAN: 1♂, 1♀, Wangdi Phodrang, 1300m, 25.–26.VI.1972.

**Distribution.** India to Thailand, adventive on Hawaii. The species was insufficiently described and previously misinterpreted (INGRISCH 1998).

***Velarifictorus aspersus* (WALKER, 1869)**

**Material examined.** BHUTAN: 4♂, 19♀, Samchi, 350–450m, 7.–11.V.1972; Phuntsholling 200–400m, 6.V.1972; 1♀ nymph, Timphu 29.IV.1972. INDIA: 1♀, Darjeeling, Manjitar, 30.VI.1987, lg. W. Thomas (CI).

**Distribution.** Oriental Region.

***Velarifictorus sikkimensis* (BHOWMIK, 1967)**

**Material examined.** BHUTAN: 2♀, Phuntsholling, 200–600m, 15.IV.1972; 2♂, km 87 from Phuntsholling, 1680m, 22.V.1972; 1♀, Khala, 200m, 25.IV.1972; 1♂, 1♀, Timphu, 26.–28.IV.1972; 2♂, 3♀, Timphu, 31.V.1972; 2♂, Timphu, 27.VI.1972; 3♀, Timphu, VIII.1975; 1♂, 2♀, Samchi, 350–450m, 7.–11.V.1972; 5♂, 5♀, Changra 18 km S. Tongsa, 1900m, 22.VI.1972; 1♀, Paro, 2300m, VI.1972; 1♂, 2♀, Gidaphu, 2300m, 2.VI.1972; 1♀, Wangdi Phodrang, 1300m, 25.–26.VI.1972; 1♀, 21 km E. Wangdi Phodrang, 1700–2000, 1972. INDIA: 1♀, Darjeeling, Bijanbari, 800m, 12.V.1975, lg. W. Wittmer.

**Distribution.** North East India (VASANTH 1993).

**Remarks.** *Velarifictorus bhadurii* (BHOWMIK, 1967) and several other taxa were recently synonymised with *V. sikkimensis* by VASANTH (1993).

***Velarifictorus* sp.**

**Material examined.** NEPAL: 1♀, Pokhara, 820m, V.–VI.1977, lg. J.Bovier.

**Remarks.** Without corresponding male it is not possible to identify the exact species.

***Turanogryllus histrio* SAUSSURE, 1877**

**Material examined.** BHUTAN: 3♂, 1♀, Phuntsholling, 200–600m, 15.IV.1972; 4♂, 13♀, 1 nymph, Samchi, 350–450m, 7.–11.V.1972. NEPAL: 1♂, 1♀, Pokhara, 820m, V.–VI.1977, lg. J.Bovier.

**Distribution.** Indian subcontinent.



***Turanogryllus rufoniger* CHOPARD, 1925**

**Material examined.** BHUTAN: 2♂, 3♀, Wangdi Phodrang, 1300m, 25.–26.VI.1972; 1 nymph (male last instar), 1♀, Changra 18 km S. Tongsa, 1900m, 22.VI.1972.

**Distribution.** North India to Indochina.

***Spinogryllus meghalayanus* VASANTH, 1993**

**Material examined.** BHUTAN: 1♂, Samchi, 350–450m, 7.V.1972.

**Distribution.** Previously only known from the type locality in Shillong, Meghalaya, NE India (VASANTH 1993).

***Gryllodes supplicans* (WALKER, 1859)**

**Material examined.** BHUTAN: 1♀, Timphu river, 2300m, 29.IV.1972 [short winged form, f. *sigillatus* (WALKER, 1869)].

**Distribution.** Circumtropical, synanthropic.

***Itaropsis* sp.**

**Material examined.** BHUTAN: 2♀, Samchi, 350–450m, 7.–11.V.1972.

**Remarks.** The genus is characterised by the reduced ovipositor. The two females at hand are larger and have longer wings than the only species recorded from the Indian subcontinent, *Itaropsis tenellus* (WALKER, 1869). It is however unwise to describe new cricket species from females without knowledge of the corresponding males.

***Acanthoplistus birmanus* SAUSSURE, 1877**

**Material examined.** BHUTAN: 2♀, Samchi, 350–450m, 7.–11.V.1972; 1♀, Phuntsholing, 16.IV.1972. NEPAL: 1♀, Pokhara, 820m, V.–VI.1977, J.Bovier; 1♀, Nepal, Janakpur, Dolakha, Tama Koshi, 850m–1100m, 24.–29.V.1989, M. Brancucci. INDIA: 1♀, Darjeeling, Bijanbari, 800m, 12.V.1975, W. Wittmer.

**Distribution.** India and Indochina.

**Subfamily Itarinae*****Itara (Itara) sericea* (WALKER, 1869)**

**Material examined.** BHUTAN: 2♂, 1♀, 86 km from Phuntsholing, 1680m, 22.V.1972; 1♀, Phuntsholing, 200–400m, 6.V.1972.

**Distribution.** Previously only known from Silhet in Bangladesh.

**Remarks.** The genus was recently revised by GOROCHOV (1996, 1997) and *I. sericea* re-established as a valid species.

***Itara (Itara) abdita* GOROCHOV, 1996**

**Material examined.** INDIA: 1♂, 2♀, Darjeeling, Manjitar, 30.VI.1987, lg. W. Thomas (CI).

**Distribution.** Described from Sikkim; also recorded from South India, Madras (GOROCHOV 1997).

**Family Trigoniidae**

**Subfamily Trigoniinae**

***Trigonidium cicindeloides* RAMBUR, 1839**

**Material examined.** BHUTAN: 1♀, Changra, 18 km S. Tongsa, 1900m, 22.VI.1972. INDIA: 1♀ (short-winged form), Darjeeling, envir. of Kalimpong, 16.X.1975, lg. B. Bhakta.

**Distribution.** Tropical Asia, South Europe, Africa.

**Subfamily Nemobiinae**

***Dianemobius (Dianemobius) fascipes* (WALKER, 1869)**

**Material examined.** BHUTAN: 2♀ parapterous, Phuntsholing, 200–400m, 12.V.1972; 1♀ parapterous, Samchi, 350–450m, 11.V.1972; 1♀, Timphu river 2300m, 29.IV.1972. INDIA: 1♀ parapterous, Darjeeling, Jhepi 1300m, 17.V.1975, lg. W. Wittmer.

**Distribution.** Oriental Region.

***Dianemobius (Dianemobius) timphus* INGRISCH, 2001**

(Figs 33–40, Addendum 58–62)

**Material examined.** BHUTAN: 1♂, Timphu, 31.V.1972 (holotype, NHMB); 1♂, Bumthang, 1.VII.1974, lg. F. Maurer; 1♂, Paesseling, 23.V.1976, 3100–3400m, lg. W. Roder & L. Caminada (paratypes, NHMB).

**Remarks.** It was my intention to describe this taxon in the present paper. Due to the overlapping use of the species name in two publications and some delay in printing, the formal description was already done in INGRISCH (2001).

**Re-description.** Small species of rather uniform dark coloration. Head blackish brown, eyes light; vertex and occiput with 7 longitudinal whitish or yellowish lines; labrum of a lighter shade of brown, palpi dark brown (all segments); antenna with scapus and pedicellus dark brown, flagellum light brown on dorsal, medium to dark brown on ventral side (Figs 33–36). Pronotum with anterior margin slightly concave, posterior margin slightly convex; disc dark brown with 3 irregular and often interrupted white

longitudinal bands and some additional whitish spots (the extension of the white coloration varies between individuals); anterior and posterior margins whitish with black and brown spots; paranota blackish brown (Fig. 34). Tegmen transparent with blackish brown infumation; humeral angle, area at chords, very base and a spot behind mirror whitish; with one very long oblique vein; mirror broader than long with anterior and posterior angles produced (Fig. 38). Hind wings absent. Abdomen and legs dark chocolate brown; postfemur indistinctly striated or not; spines and spurs of posttibia with white tips. Posttibia with 3 external and 4 internal spines and 3 apical spurs at each side, the externo-medial and the interno-dorsal spurs being the longest ones, the latter surpassing middle of metatarsus (Fig. 37).

Male. Tenth abdominal tergite transverse, circa rectangular with concave lateral margins, slightly furrowed in middle; apical margin truncate. Epiproct semi-oval with a medial furrow. Subgenital plate funnel-shaped, rather broad, apical margin slightly concave in middle and with rounded lateral angles. Epiphallus with bridge rather long, with a V-shaped incision from base, slightly constricted and step-like declined in about middle of length; medial lobes of epiphallus connected at base by membrane, constricted on medial side and strongly curved mediad behind constriction with convex external and concave internal surface; apex acute (Figs 39–40).

Female see Addendum.

Measurements of males (in mm): body 4.7–5.7; pronotum 1.0–1.2; tegmen 2.5–3.5; postfemur 3.3–4.2.

**Distribution.** Bhutan and far eastern Nepal.

**Differential diagnosis.** *D. timphus* INGRISCH, 2001 is similar to *D. chinensis* GOROCHOV, 1984 (only known in the female sex). It differs by the coloration being less contrasting, head with 7 (instead of 6) long (not short) light bands on vertex; by fourth and fifth segments of maxillary palpi dark brown (not white); by the pronotum hardly narrowed in front; by the hind wings absent (not long); the postfemur is uniformly dark brown without distinct pattern and only indistinctly striated if at all; the posttibia has the spines dark brown (not whitish), the inferior spur is present (not absent); the coloration of the abdomen is uniformly dark brown (not whitish beneath).

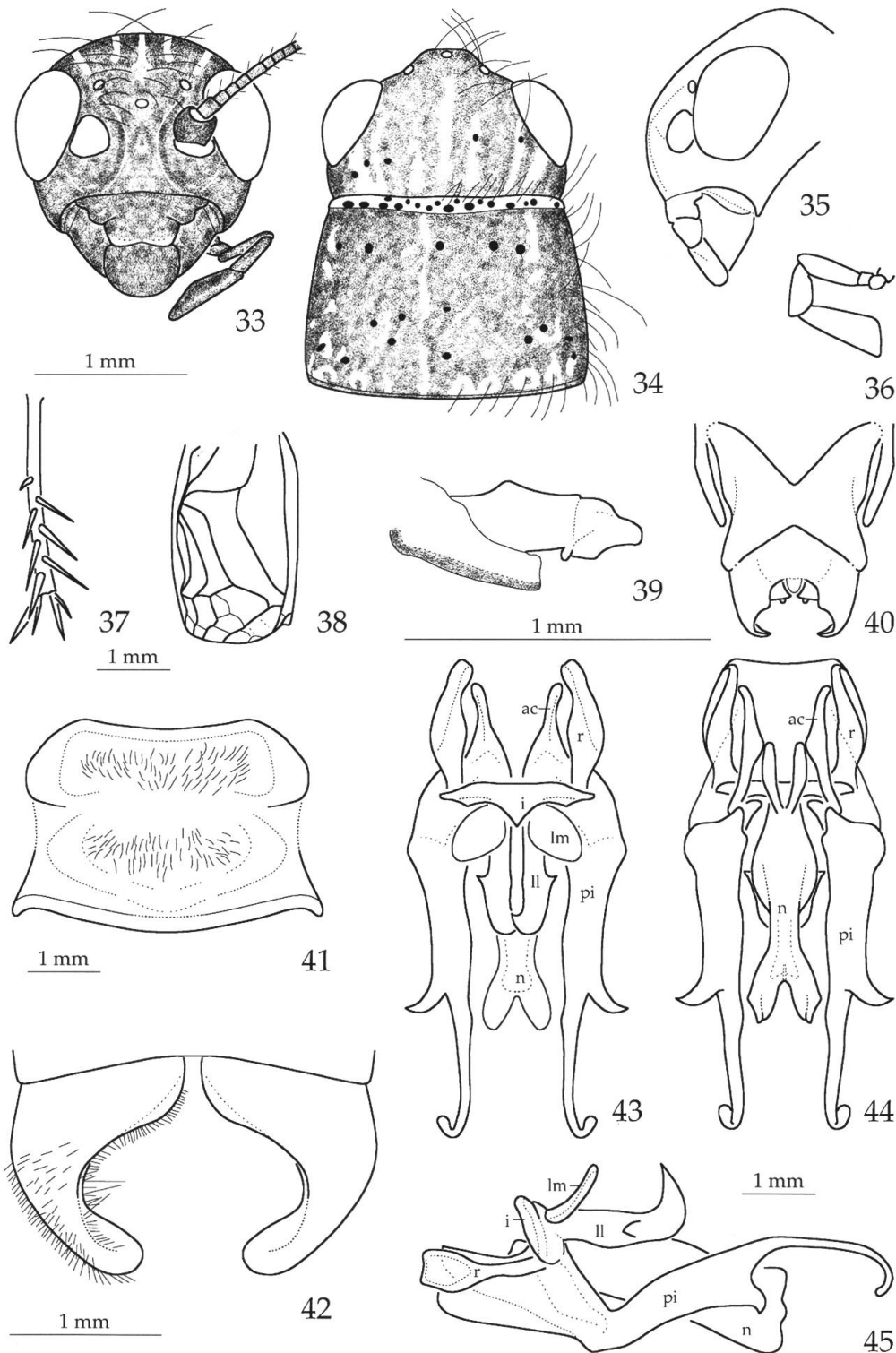
### ***Dianemobius (Polionemobius) taprobanensis* (WALKER, 1869)**

**Material examined.** BHUTAN: 1♀, Bumthang, 1.VII.1974, lg. F. Maurer; 1♀, Samchi, 350–450m, 7.–11.V.1972.

**Distribution.** Oriental Region.

### ***Dianemobius* sp.**

**Material examined.** BHUTAN: 1 nymph, Timphu, 16.–27.IV.1972. INDIA: 1 nymph, Darjeeling, Lebong, 16–1800m, 2.VI.1975, lg. W. Wittmer.



**Figs 33–45.** *Dianemobius (Dianemobius) timphus* INGRISCH, 2001 ♂ (holotype; 38, paratype): 33, head in anterior view; 34, head and pronotum in dorsal view; 35, head in lateral view; 36, maxillary palpus; 37, right posterior tibia; 38, right tegmen; 39, phallus in lateral view; 40, do. in dorsal view. *Truljalia lata* sp.nov. ♂ (holotype): 41, metanotal gland; 42, last abdominal tergite; 43, phallus in dorsal view; 44, do. ventral view; 45, do. lateral view. Abbreviations: ac = ectophallus apodeme, i = epiphallus, ll = lateral lobes of epiphallus, lm = medial lobes of epiphallus, n = endophallus, pi = epiphallus parameres, r = rami.

**Subfamily Podoscirtinae*****Calypotrypus bimaculatus* CHOPARD, 1928**

**Material examined.** BHUTAN: 1♂, Samchi, 350–450m, 7.–11.V.1972.

**Distribution.** Only known from Bhutan.

***Truljalia lata* sp.nov.**

(Figs 13, 41–45)

**Material examined.** Holotype ♂, BHUTAN: Phuntsholling, 200–400m, 6.V.1972 (NHMB).

**Description.** Male. Medium sized; body finely pubescent with very short and fine hairs; head and pronotum glabrous, almost subsmooth. Head rather small, eyes projecting. Ocelli moderately large, obliquely inserted with posterior-medial margins rised. Frontal rostrum about half as broad as scapus. Pronotum widening posteriorly, disc flattened, lateral margins of disc angularly bent into paranota. Metanotal gland consisting of two shallow grooves, the anterior one angular with rounded angles, the posterior one oval, both grooves surrounded by a weakly bulging carina and covered with short hairs; grooves fused in middle (Fig. 41). Tegmina rather long and narrow, surpassing apex of abdomen; hind wings caudate (Fig. 13). Tegmen with 3 large and 4 small oblique veins; mirror slightly longer than broad (33:28), lateral field with about 15 oblique subcostal veinlets. Stridulatory file on underside of right tegmen with about 150 teeth. Anterior tibia strongly swollen at tympana; internal tympanum only with a slit-like opening on posterior side; external tympanum ovoid, free.

Supra anal plate divided in middle, with two obtuse, setose projections which are curved in specimen at hand (artefact?) (Fig. 42). Subgenital plate funnel-shaped, conical; apex truncate. Phallus long and slender (Figs 43–45). Epiphallus transverse, compressed, with a short, acute-angular, medial projection; medial lobes of epiphallus circa ovoid, compressed, hyaline; lateral lobes of epiphallus lanceolate with hook-shaped acute apex and a lateral acute tooth. Epiphallus parameres very long, cylindrical, slightly sinuate, with an acute ventro-lateral tooth, trunk of parameres rather stout before that tooth, strongly narrowed behind; apex strongly recurved, compressed and obtuse. Ectophallus submembranous, largely fissing at apex. Endophallus membranous.

Female unknown.

**Coloration.** Yellowish brown but discolored due to previous storage in alcohol (probably partly green when alive). Antennae with ventral side (antennae directed anteriorly) dark brown, dorsal side light with indistinct annulation. Vertex behind compound eyes with two blackish brown bands embracing a whitish band and with 3 blackish brown spots on occiput. Pronotum with lateral angles orange brown, bordered on external side by an interrupted black band. Tegmen with lateral area light, dorsal area infumate and with brown veins.

Measurements of male (length in mm): body 16; length with wings 27; pronotum 3.5; pronotum width 4.7; tegmen 21; postfemur 10.

13

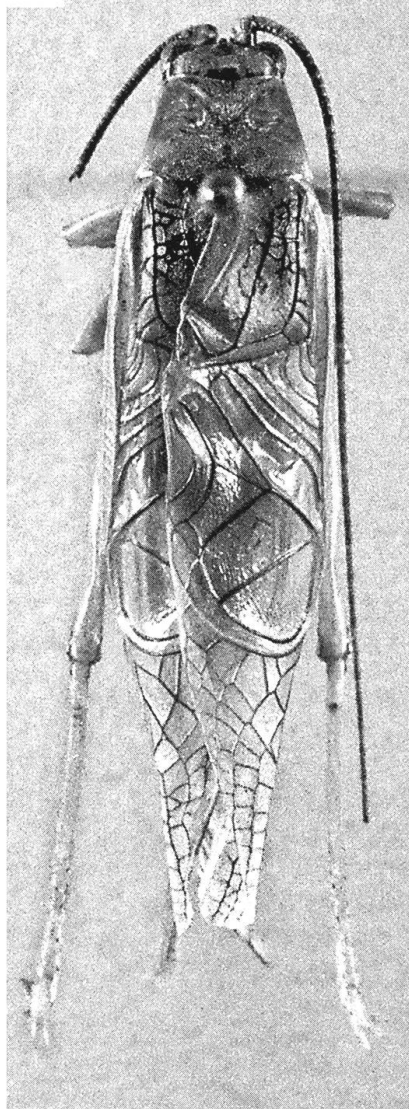


Fig. 13. *Truljalia lata* sp.nov. ♂ (holotype).

**Distribution.** Bhutan.

**Differential diagnosis.** The new species is similar to *Truljalia versicolor* INGRISCH, 1997 from Thailand and *T. hofmanni* (SAUSSURE, 1878) from Java. It differs by the metanotal gland being wider and the posterior groove more expressed than in *T. versicolor* (metanotum about 1.45× wider than long in *T. lata*, 1.15× wider than long in *T. versicolor*). It also differs by the phallus which is wider and has the epiphallus parameres stouter at base but distinctly narrower behind ventro-lateral tooth. From *T. hofmanni*, the new species differs by the epiphallus parameres which have a large (not minute) ventro-lateral tooth, which are distinctly constricted behind that tooth (not gradually narrowed to apex), which are only re-curved at apex (not over the whole apical half), and which have the apex less distinctly widened.

**Name derivation.** The name refers to the epiphallus parameres that are stout at base.

### Family Oecanthidae

#### *Oecanthus indicus* SAUSSURE, 1878

**Material examined.** BHUTAN: 1♂, Wangdi Phodrang 1300m, 7.VI.1972; 1♀, Phuntsholling, 200–600m, 15.IV.1972. INDIA: 1♀, Meghalaya, Darugiri, Garu Hills, lg. Wittmer & Baroni Urbani, 19.V.1976; 1♀, Darjeeling, Manjitar, 30.VI.1987, lg. W. Thomas (CI).

**Distribution.** Oriental Region, China, and Japan.

#### *Oecanthus bilineatus* CHOPARD, 1937

**Material examined.** NEPAL: 1♀, Danda Pakhar, 1600–2500m, 2.VI.1977, lg. M. Brancucci.

**Distribution.** Previously known from South India.

**Remarks.** The specimen at hand agrees with the description in CHOPARD (1937, 1969), but head and pronotum are adorned with a narrow yellow medial line (not a band) which is bordered on both sides by broad black bands.



**Family Gryllotalpidae**  
**Subfamily Gryllotalpinae**

***Gryllotalpa orientalis* BURMEISTER, 1839**

**Material examined.** BHUTAN: 1♀, Samchi, 350–450m, 7.–11.V.1972. NEPAL: 1♀, Bagmati, Kabhre, Dhad Khola, 600m, 31.V.1989, lg. M. Brancucci; 2♂, 1♀, East Nepal, Mechi, Dobhan, 700m, 7.VI.1985, lg. M. Brancucci.

**Distribution.** Oriental Region.

***Gryllotalpa ornata* WALKER, 1869**

**Material examined.** BHUTAN: 9♀, Samchi, 350–450m, 7.–11.V.1972. INDIA: 1♀, Darjeeling, 2150m, 6.V.1975, lg. W. Wittmer.

**Distribution.** India, Assam, Bhutan.

***Gryllotalpa obscura* CHOPARD, 1966**

**Material examined.** BHUTAN: 1♀, Bumthang, VII.1974, lg. F. Maurer. NEPAL: 1♀, East Nepal, Mechi, Dobhan, 700m, 7.VI.1985, lg. M. Brancucci.

**Distribution.** Previously only known from Nepal.

***Gryllotalpa* sp.**

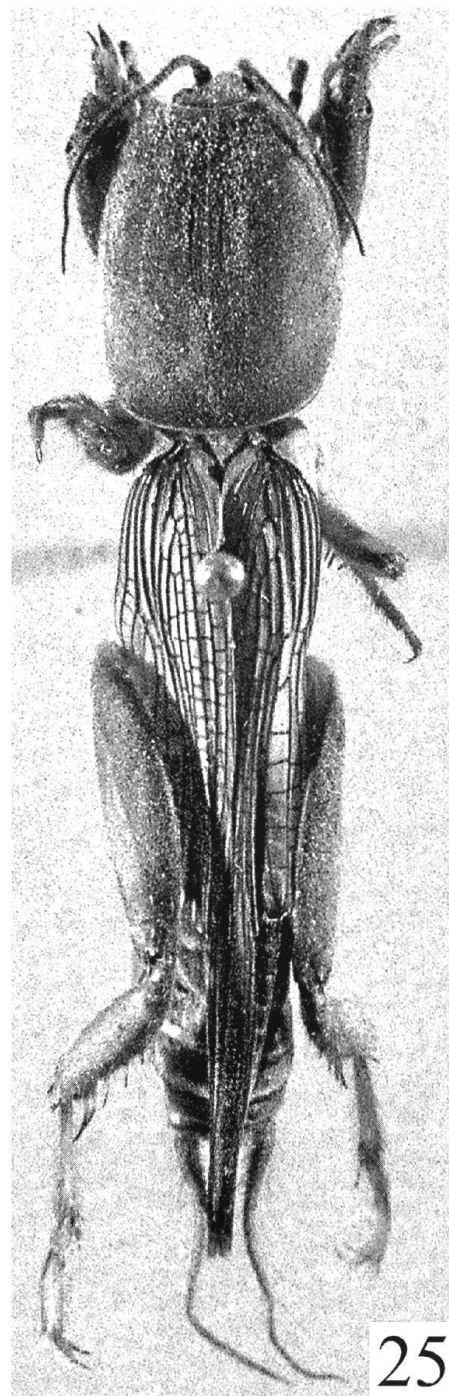
**Material examined.** BHUTAN: 1 nymph, Changra, 18 km S of Tongsa, 1900m, 22.VI.1972; 1 nymph, Samchi, 350–450m, 7.–11.V.1972; 1 nymph, Timphu, 24.IV.1972.

**Subfamily Scapteriscinae**

***Scapteriscus nepalicus* sp.nov.**

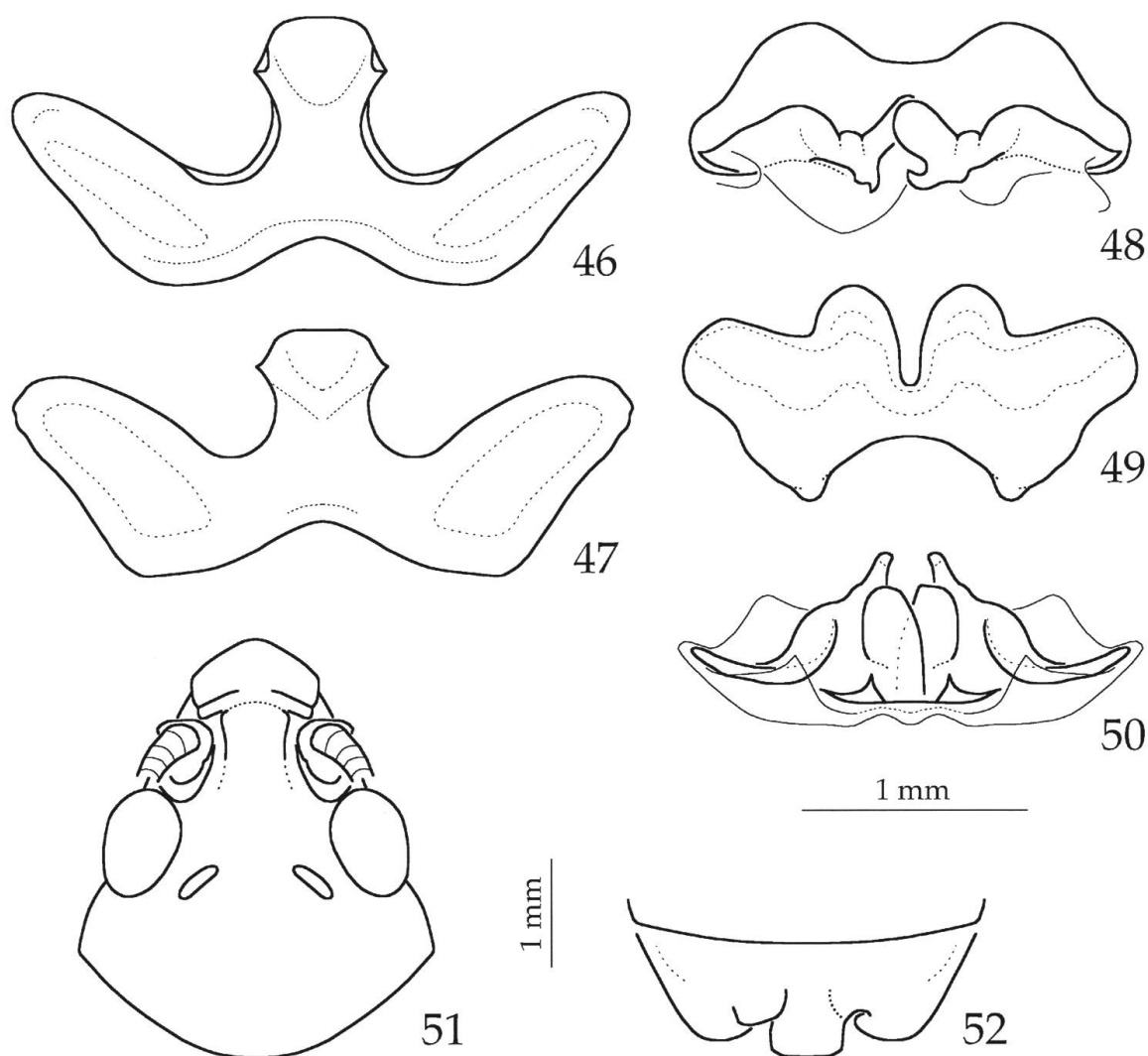
(Figs 25, 46–52)

**Material examined.** Holotype ♂, NEPAL: Bagmati, Kabre, Dhad Khola, 600m, 31.V.1989, lg. M. Brancucci (NHMB).



**Fig. 25.** *Scapteriscus nepalicus* sp.nov. ♂ (holotype): 25, habitus.

**Description.** Frontal rostrum narrow, its width in front scarcely (1.1×) wider than width of antennal scapus. Lateral ocelli separated from each other by a space circa 1.5 times their length (Fig. 51). Tegmen reaching circa fifth abdominal tergite; dorsal field with 8 parallel veins, without a trace of a stridulatory organ in male (Fig. 25). Hind wings caudate, slightly surpassing tip of abdomen. Shape of pronotum and legs as in *S. leptodactylus* CHOPARD, 1928 and *S. siangensis* TANDON & SHISHODIA, 1972.



**Figs 46–52.** *Scapteriscus nepalicus* sp.nov. ♂ (holotype): 46–47, epiphallus; 48–50, parameres in different views; 51, head; 52, subgenital plate.

Male. Last abdominal tergite fused with epiproct, triangularly projecting behind. Subgenital plate transverse, apex shortly trilobate, with shorter lateral and a longer medial lobe, the latter with broadly subtruncate apex, all three lobes semi-tubular (Fig. 52). Phallus: Transverse sclerite of epiphallus with broad lateral parts, medial prolongation short with apex trapezoid (Figs 46–47). Parameres of complex structure as in Figs 48–50.

Female unknown.

Coloration. Head with vertex and labrum blackish brown, laterally medium brown; ocelli and clypeus whitish, remaining mouthparts medium brown, tips black, eyes dark reddish brown. Pronotum with disc dark brown without conspicuous pattern, split in middle by a very fine yellow line; dark coloration gradually becoming lighter towards light brown ventro-lateral margins. Tegmen whitish with dark brown venation. Abdominal tergites dark brown with light posterior margins. Anterior legs medium



brown with black dactyls; medial and posterior legs light brown; postfemur dark brown in circa dorsal half. Thoracic pleurae and sternites light brown.

Measurements of male (length in mm): body 27; pronotum 9.0; pronotum-width 6.0; tegmen 12.5; tegmen and hind wing 22.0; postfemur 8.0.

**Distribution.** Nepal.

**Differential diagnosis.** The new species is characterised by the narrow frontal rostrum and the dark brown pronotum without conspicuous pattern. The subgenital plate and phallus are also species specific. It differs from *S. siangensis* (which is only known in the female sex and described from NE India) by a narrower frontal rostrum and larger ocelli, the pronotum without yellowish brown spot in middle, the labrum being blackish brown (not medium brown), and the tegmina reaching the fifth (not fourth) abdominal tergite. From *S. leptodactylus* (described from North India and also occurring in southern Nepal), it differs – apart from coloration and smaller ocelli – by the male subgenital plate with the medial lobe longer than the lateral ones (not vice versa) and by the shape of the phallus (see INGRISCH 1990b).

**Name derivation.** The name is derived from the country of origin.

*Scapteriscus* sp.

**Material examined.** BHUTAN: 2 nymphs, Timphu river 2300m, 29.IV.1972.

**Order Caelifera**

**Superfamily Eumastacoidea**

**Family Eumastacidae**

**Subfamily Chorotypinae**

*Xenerianthus affinis* (WESTWOOD, 1843)

**Material examined.** BHUTAN: 1♀, Phuntsholing, 200–400m, IX.1975.

**Distribution.** Assam and Burma.

**Superfamily Pamphagoidea**

**Family Pyrgomorphidae**

*Atractomorpha himalayica* BOLÍVAR, 1905

**Material examined.** BHUTAN: 1♀, Chimakothi 1900/2300m, 22.V.1972; 1♂, 1♀, km 87 from Phuntsholing, 1680m, 22.V.1972. NEPAL: 2♂, 2♀, East Nepal, Gorza 2100m, 5.–6.VI.1985, lg. M. Brancucci.

**Distribution.** Eastern Himalaya.

***Atractomorpha angusta* KARSCH, 1888**

**Material examined.** BHUTAN: 1♂, 1♀, Samchi 350–450m, 7.–11.V.1972.

**Distribution.** Nepal and Northeast India to Indochina, Malay Peninsula, Sumatra, Andaman Islands.

**Superfamily Acridoidea**

**Family Acrididae**

**Subfamily Euthyminae**

(= Hemiacridinae)

***Spathosternum prasiniferum* (WALKER, 1871)**

**Material examined.** BHUTAN: 1♀, Kharbandi 700m, IX.1975, lg. Dorjee Khandu Dukpa; 1 L., Thimphu, VIII.1975. NEPAL: 1 L., Phokhara 820m, V.–VI.1977, lg. J.Bovier.

**Distribution.** Indian and Indo-Chinese Subregions.

**Subfamily Catantopinae**

***Stenocatantops splendens* (THUNBERG, 1815)**

**Material examined.** BHUTAN: 1♀, 21 km E of Wangdi Phodrang, 1700–2000m, 1972.

**Distribution.** Oriental Region and Indonesia.

***Xenocatantops humilis brachycerus* (C. WILLEMSE, 1932)**

**Material examined.** BHUTAN: 3♂, 2♀, km 87 from Phuntsholing, 1680m, 22.V.1972; 1♂, Samchi 350–450m, 7.–11.V.1972; 1♀, Wangdi Phodrang 1300m, 7.VI.1972; 1♀, Kharbandi 700m, VIII.1975; 1♀, Phuntsholing, 200–400m, IX.1975. NEPAL: 1♀, Janakpur Dolakha 24.–29.V.1989, Tama Koshi 850–110m, lg. M. Brancucci. INDIA: 1♂, 1♀, Darjeeling, Lopchu 1500m, 9.V.1975, lg. W. Wittmer;

**Distribution.** China, Taiwan, Bhutan, Sikkim, Nepal, North India; the nominate subspecies in Nepal and in the south of the Oriental Region and Indonesia.

***Diabolocatantops pinguis* (STÅL, 1860)**

**Material examined.** BHUTAN: 1♂, Wangdi Phodrang 1300m, 7.VI.1972.

**Distribution.** Oriental Region.

**Remarks.** The Oriental taxa of this genus urgently need a revision.

**Subfamily Coptacrinae****?*Apalacris* sp.**

**Material examined.** BHUTAN: 1 nymph, Kharbandi 700m, IX.1975.

**Subfamily Cyrthacanthacridinae*****Patanga japonica* (BOLÍVAR, 1898)**

**Material examined.** BHUTAN: 2♀, Paro 2300m 1./19.V.1972; 2♀ Timphu 2440m, 20.IV.1972; 1♀, Timphu, VIII.1975.

**Distribution.** Japan to northeastern Himalaya.

**Subfamily Eyprepocnemidinae*****Choroedocus robustus* (SERVILLE, 1838)**

**Material examined.** BHUTAN: 1♂, 1♀, Phuntsholing 200–400m, IX.1975.

**Distribution.** Assam, Nepal.

***Euprepocnemis alacris* (SERVILLE, 1838)**

**Material examined.** BHUTAN: 2♂, 1♀, Wangdi Phodrang 1300m, 7.VI.1972.

**Distribution.** Iran to Thailand.

**Subfamily Oedipodinae  
(= Locustinae)*****Locusta migratoria manilensis* (MEYEN, 1835)**

**Material examined.** BHUTAN: 1♂, 1♀, Bunthang, 1.VII.1974, lg. F. Maurer.

**Distribution.** Indo-Malayan Region.

***Gastrimargus africanus parvulus* SJÖSTEDT, 1928**

**Material examined.** BHUTAN: 1♀, Wangdi Phodrang 1700m, 7.VI.1972.

**Distribution.** The subspecies *africanus* has been reported from Africa to Pakistan, India, Sri Lanka, Nepal, Tibet, Burma, Thailand; the subspecies *parvulus* from China, Vietnam, Thailand, Burma, and Java.

***Sphingonotus longipennis* SAUSSURE, 1884**

**Material examined.** BHUTAN: 2♂, Samchi 350–450m, 7.–11.V.1972.

**Distribution.** Himalayan species, known from Afghanistan, North India, Assam, Darjeeling, Nepal, and China.

***Trilophidia annulata* (THUNBERG, 1815)**

**Material examined.** BHUTAN: 2♂, 3♀, Samchi 350–450m, 7.–11.V.1972; 1♂, Kharbandi 700m, IX.1975.

**Distribution.** Oriental Region.

***Aiolopus thalassinus thalassinus* (FABRICIUS, 1781)**

**Material examined.** BHUTAN: Thimphu 2440m: 1♀, 20.IV.1972, 1♂, 3♀, 30.IV.1972, 6♂, 6♀, 31.V.1972; 1♂, Kharbandi 700m, IX.1975.

**Distribution.** The nominate subspecies is recorded from Europe and Africa to India and Nepal, the subspecies *tamulus* (FABRICIUS) occurs from India to Japan and Australia.

**Subfamily Acridinae*****Acrida exaltata* (WALKER, 1859)**

**Material examined.** BHUTAN: 2♂, Khala 200m, 25.IV.1972; 1♀, 1 L., Wangdi Phodrang 1300m, 7.6.1972; 1♀, Kharbandi 700m, VIII.1975. NEPAL: 1♀, Pokhara, VII/VIII. 1977, lg. J.Bovier; 1♀, Bagmati, Dolakha, Tama Koshi 850–1100m, 24.–29.V.1989, lg. M. Brancucci. INDIA: 1♀, Meghalaya, Darugiri, Garo Hills 450m, 19.V.1976, lg. W. Wittmer & Baroni Urbani.

**Distribution.** Sri Lanka, India, Assam, Kashmir, Nepal, Southeast Tibet, Pakistan, Afghanistan, Persia, Arabia.

**Subfamily Phlaeobinae*****Phlaeoba panteli* BOLÍVAR, 1902**

**Material examined.** BHUTAN: 1♂, km 87 from Phuntsholing, 1680m, 22.V.1972.

**Distribution.** India.

***Phlaeoba sikkimensis* RAMME, 1940**

**Material examined.** INDIA: 1 nymph, Darjeeling, Lopchu 1500m, 9.V.1975, lg. W. Wittmer.

**Distribution.** Known from Sikkim and Nepal.

### Acknowledgement

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## ADDENDUM

New Orthoptera specimens from Bhutan, conserved in alcohol, appeared during preparation of the manuscript for the print. The material includes the formerly unknown male of *Schizodactylus brevinotus* sp.nov., the female of *Dianemobius* (*Dianemobius*) *timphus* INGRISCH, 2001, and 4 unreported species.

### Family Schizodactylidae

#### *Schizodactylus brevinotus* sp.nov.

**Additional material examined.** NEPAL: 1 ♂ (paratype), E-Nepal, Koshi, Lumbughat-Baiseghat, 450 m, 15.VI.1985.

**Description of male.** General habitus and coloration as female. Anterior tibia with apical external spine distinctly shorter than preceding (Fig. 56). Tenth abdominal tergite transverse, sclerotised plate interrupted in middle; with a large membranous apical projection that is deeply furrowed in midline, medial areas of expansion with granular surface (Fig. 53). Epiproct small, furrowed in midline, only visible from behind or below (Fig. 54). Paraproctes with a narrow projection terminating in an acute tooth (Figs 54-55); apico-lateral margin ornated with a brown band. Subgenital plate with apex triangularly excised (Fig. 54). Cerci elongate, slightly curved dorsad, gradually narrowing in basal two thirds and slightly widening again in apical third, apex obtuse (Figs 53-55).

Measurements of male (length in mm): body 30; pronotum in middle 2.5; pronotum at the sides 3.7; pronotum-width 7.5; tegmen 18.5; anterior femur 8.2; mesofemur 9.5; postfemur 15.5; posttibia 12.7; cercus 7.5.

**Differential diagnosis.** The male of *S. brevinotus* is similar in size to *S. minor* ANDER, 1938 from "Ganges". It differs from the insufficient description of the latter by a shorter pronotum and the subgenital plate which is cut for less than half of its length instead of more than half of its length. From other species of the genus, it differs by the shapes of the subgenital plate and the paraproctes.

### Family Gryllidae

#### *Dianemobius* (*Dianemobius*) *timphus* INGRISCH, 2001

**Additional material examined.** BHUTAN: 1 ♂, Chimakothi, 2100 m, 14.V.1972; 2 ♂, 2 ♀, Chimakothi, 1900-2300 m, 22.V.1972; 3 ♂, Sampa-Kotoka, 1400-2600 m, 9.VI.1972; 1 ♀, 13 km E Wangdi Phodrang, Tan Chu, 1300 m, 7.VI.1972; 2 ♂, 6 ♀, Thimphu, 2300-2500 m, 31.V.1972; 1 ♀, Thimphu, 2300-2500 m, 27.VI.1972; 1 ♀, Paro, 2300 m, ? 7.VI.1972; 2 ♂, 2 ♀, Dechhi Paka, ca. 5 km E Pelela, 3300 m, 19.-20.VI.1972; 1 ♂, Changra, 18 km S Tongsa, 1900 m, 22.VI.1972.

**Description of female.** Tegmen in dorsal area with 5–6 longitudinal veins and few cross veins between veins 2 and 4; dorsal area varying from brown with pale veins and a light humeral band to uniformly light yellow; lateral area dark reddish brown. Subgenital plate smaller than preceding sternite, apex with a narrow excision in middle and with long hairs (Fig. 61). Ovipositor with apical valves not serrated (Fig. 62); dorsal valves near apex under large magnification with a row of minute tubercles along ventral margin.

The coloration of the series of specimens at hand varies from almost uniformly dark reddish brown with the pattern described before to light forms that have the dorsal areas of head, pronotum and tegmen medium to light yellowish brown; lateral areas of body and abdominal tergites always dark reddish or chocolate brown. Head with 7 light lines on vertex always distinct; apical segments of palpi dark brown. Postfemur dark brown with indistinct striation or distinctly striated and ventral areas light brown.

Measurements of specimens in alcohol (in mm): body ♂ 6.5–7.6, ♀ 6.6–7.7; pronotum ♂ 1.2–1.3, ♀ 1.2–1.4; tegmen ♂ 3.4–3.9, ♀ 2.6–3.1; postfemur ♂ 3.9–4.3, ♀ 4.3–4.7; ovipositor 2.8–3.3.

**Differential diagnosis.** The female of *D. timphus* differs from *D. chinensis* GOROCHOV, 1984 by the ovipositor which is about twice as long as in the latter and has the margins of the apical valves not serrated.

**Remark.** The male phallus of specimens in alcohol is better conserved than in dried material studied before and thus figured again (Figs 58–60).

### Additional species for the fauna of Bhutan

#### Family Gryllidae

#### Subfamily Nemobiinae

#### *Pteronemobius heydeni concolor* (WALKER, 1871)

**Material examined.** BHUTAN: 1 ♂, Phuntsholing 200–400 m, 6.V.1972.

#### *Speonemobius decolyi* CHOPARD, 1967

**Material examined.** BHUTAN: 2 ♂, Changra, 18 km S Tongsa, 1900 m, 22.VI.1972.

**Distribution.** Described from India: Assam, Pedang.

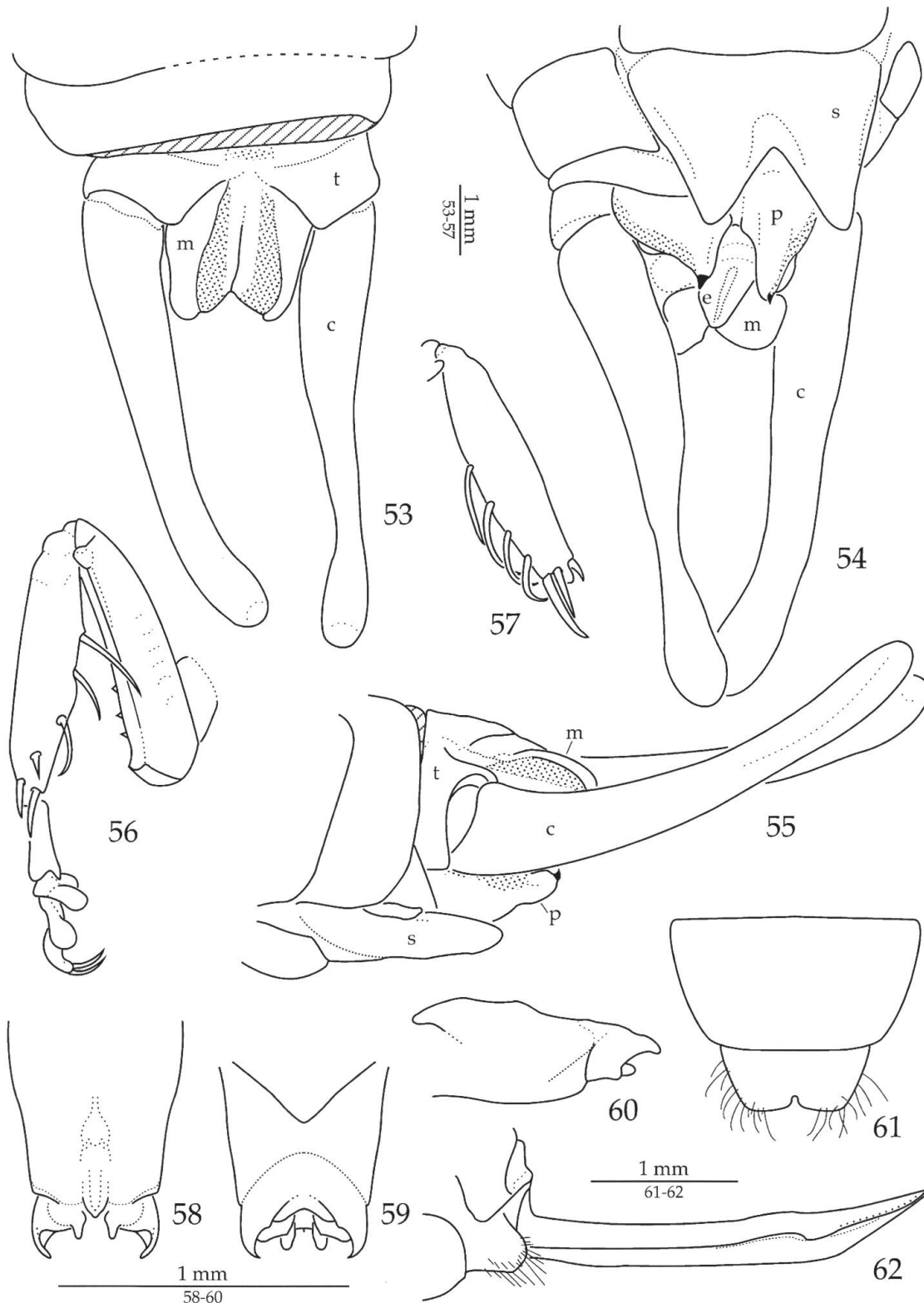


**Subfamily Sclerogryllinae*****Sclerogryllus coriaceus* (HAAN, 1842)**

**Material examined.** BHUTAN: 1 ♀, Changra, 18 km S Tongsa, 1900 m, 22.VI.1972.

**Family Tetrigidae*****Hedotettix attenuatus* HANCOCK, 1904**

**Material examined.** BHUTAN: 1 ♂, Samchi, 350-450 m, 7.-11.V.1972.



**Figs 53–62.** *Schizodactylus brevinotus* sp.nov. ♂ (paratype): 53, apex of abdomen in dorsal view; 54, do. in ventral view; 55, do. in lateral view; 56, anterior leg in external view; 57, anterior tibia in internal view. *Dianemobius* (*Dianemobius*) *timphus* INGRISCH (from Chimakothi, no types): 58, male phallus in ventral view; 59, do. in dorsal view; 60, do. in lateral view; 61, female subgenital plate and penultimate sternite; 62, ovipositor. Abbreviations: c = cercus, e = epiproct, m = membranous projection of tenth abdominal tergite, p = paraproct, s = subgenital plate, t = tenth abdominal tergite.

