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Records of the Zoological Survey of India

Studies on Indian Labidurinae (Dermaptera)

by

G. K. SRIVASTAVA

**Issued by the Director
Zoological Survey of India, Calcutta**

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G. K. SRIVASTAVA

Zoological Survey of India, Calcutta



सत्यमेव जयते

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1986

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STUDIES ON INDIAN LABIDURINAE (DERMAPTERA)

By

G. K. SRIVASTAVA

Zoological Survey of India, Calcutta

INTRODUCTION

In India subfamily Labidurinae is represented by two genera viz., *Labidura* Leach and *Forcipula* Bolivar.

The genus *Labidura* contains two species, of which *L. riparia* (Pallas) is world wide in distribution and is one of the most common species in view of its occurrence in large numbers in a variety of habitats. Besides the amount of variations exhibited in this species are remarkable. The types of four species described by Baijal and Singh (1954) viz., *Diplatys himaluyanus*; *Spongiphora nainitalensis*; *Erotesis jeolikotensis* and *Elaunon nainitalensis* were examined and are synonymised under this species. The other species, *L. dharchulensis* Gangola, known from Garhwal Himalayas is retained as valid due to non-availability of its type. This species resembles with smaller forms of *L. riparia* but according to the original description and figure of male genitalia there appear to be some differences which need to be checked up.

The members of the genus *Labidura* are generally bare, with scanty pubescence on the body; elytra and wings are rugose, former with a carina on costal margin and male parameres apically with a short epemerite.

Under the genus *Forcipula* Bolivar, altogether 11 species including two new to science are recognised. It is proposed to sink here the genus *Genitalata* Kapoor, which is based on the nymphal stages of *Forcipula quadrispinosa* (Dohrn).

As a result of re-examination of Paratype 1 ♂ of *F. decolyi* Bormans, it is possible now to identify with certainty the material from India referred to this species. In fact this material comprises three species, two of which represent undescribed species with abbreviated wings and the third one is *F. clavata* Liu, with fully developed elytra and wings. The last one, considered as synonym of *F. decolyi* by Bey-Bienko (1959), is resurrected. Besides *F. obscura* Steinmann (1980) from Vietnam is sunk under *F. clavata* since both are identical in most characters.

F. despinosa Hebard which is known by its Holotype ♂ was examined and some additional information is provided. It comes

close of *F. trispinosa* (Dohrn), especially smaller forms, in having dense pubescence on the body but forceps and male parameres are distinctive.

After examining a large number of specimens representing various individual variations in *F. trispinosa* it is proposed to place *F. afghana* Steinmann (1980) as a synonym. Similary *Genitalata mahajani* Kapoor (1974) and *Forcipula simplex* Bey-Bienko (1970) which are based on nymphal stages and specimens with minor form of forceps, respectively, of *F. quadrispinosa* are synonymised under this species.

The members of genus *Forcipula* have a characteristic appearance in having the body covered with fine pubescence which is often more pronounced on abdominal segments of females in certain species only and elongated forceps. Besides male parameres are apically provided with an elongated epimerite. Most of the species commonly occur on the edge of water bodies. Some of the species though primarily adapted to sub-montane habitat are able to penetrate deep in Himalayan ranges while occurring along the edge of water courses.

LIST OF SPECIES

LABIDURINAE

Genus *Labidura* Leach

1. *Labidura riparia* (Pallas)
 (= *Diplatys himalayanus* Baijal and Singh) **Syn. n.**
 (= *Spongiphora nainitalensis* Baijal and Singh) **Syn. n.**
 (= *Erotosis jeolikotensis* Baijal and Singh) **Syn. n.**
 (= *Elaunon nainitalensis* Baijal and Singh) **Syn. n.**
2. *Labidura dharchulensis* Gangola

Genus *Forcipula* Bolivar

- (= *Genitalata* Kapoor) **Syn. n.**
3. *Forcipula abbreviata* sp. n.
 4. *Forcipula elongata* sp. n.
 5. *Forcipula clavata* Liu
 (= *Forcipula obscura* Steinmann) **Syn. n.**
 6. *Forcipula borellii* Chopard
 7. *Forcipula trispinosa* (Dohrn)
 (= *Forcipula afghana* Steinmann) **Syn. n.**
 8. *Forcipula indica* Brindle

9. *Forcipula aborensis* Brindle
10. *Forcipula despinosa* Hebard
11. *Forcipula quadrispinosa* (Dohrn)
(=*Genitalata mahajuni* Kapoor) Syn. n.
(=*Forcipula simplex* Bey-Bienko) Syn. n.
12. *Forcipula lurida* (Bolivar)
13. *Forcipula tuberculata* Srivastava

UNCERTAIN POSITION

14. *Forcipula leonardi* Steinmann

Key to genera

- 1 (2). Sides of abdominal segments in normal males without spines ; forceps robust, evenly curved ; parameres with short epimerite apically ... *Labidura* Leach
- 2 (1). Sides of certain abdominal segments in normal males with spines or tubercles ; forceps generally elongated, demarcated into basal curved, remote part extending up to or beyond middle, afterwards contiguous or subcontiguous and straight ; parameres apically with comparatively longer epimerite ... *Forcipula* Bolivar

Genus *Labidura* Leach

Labidura Leach 1815, *Edin. Encycl.*, 9 (1) : 48.

Demogorgon Kirby, 1891, *J. Linn. Soc. (Zool.)*, 23 : 513 (Type—*Demogorgon batesi* Kirby, 1891 = *Forficesila xanthopus* Stal, 1855).

Forficesila Serville, 1831, *Ann. Sci. nat.*, 22 : 32 (Type—*Forficula gigantea* Fabricius, 1793 = *Forficula riparia* Pallas, 1773).

Type species : *Forficula riparia* Pallas, 1773.

Diagnostic characters : Size medium to large (12-24 mm), rather depressed. Head convex, eyes prominent but always shorter than post ocular length ; antennae 20-35 segmented, 1st equal to 3rd. Elytra and wings well developed, former keeled laterally and latter sometimes abbreviated. Abdomen without spines or crests on sides of segments ; forceps in male stout, remote at base, slender, gently arcuate, variously armed internally.

Distribution : World wide.

Labidura riparia (Pallas)

(Figs. 1-2)

Forficula riparia Pallas, 1773, *Reise Russ. Reichs*, 2 : 727 (Sex ? ; Shores of Irtysh River, Western Siberia—Location of type unknown).

Labidura riparia Dohrn, 1863, *Stettin ent. Ztg.* 24 : 313 ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 323 ; Brunner, 1882, *Prodromus der europäischen Orthoptera* : 5 ; Bormans, 1888, *Annali Mus. civ. Stor. nat. Giacomo Doria*, 2 (4) : 434 ; Bormans, 1894, *Annali. Mus. civ. Stor. nat. Giacomo Doria*, 2 (14) : 378 ; Bormans and Krauss, 1900, *Das Tierreich*, Lief 11, Forficulidae und Hemimeridae : 33 ; Burr, 1900, *Ann. Soc. ent. Belg.*, 44 : 49 ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 1901 : 316 ; Burr, 1905, *J. Asiat Soc. Beng. (N. S.)*, 1 (2) : 27 ; Burr, 1906, *J. Asiat. Soc. Beng. (N. S.)*, 2 : 388 ; Burr, 1907, *Rec. Indian Mus.*, 1 (3) : 207 ; Burr, 1910, *Fauna Brit. India, Dermaptera* : 99, figs. 33, 34 ; Burr, 1910 *Trans R. ent. Soc. Lond.*, 1910 : 185 ; Burr, 1911, *Genera Insect.*, 122 : 37 ; Burr, 1914, *Rec. Indian Mus.*, 10 : 228 ; Hebard, 1923, *Mem. Dep. Agric. India ent. Ser.*, 7 : 707 ; Brindle, 1966, *Ann. Mag. nat. Hist.*, 13 (9) : 259 ; Brindle, 1971, *Ent. Scand. Suppl.*, 1 : 223 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 19 ; Srivastava, 1976, *Rec. zool. Surv. India Occ. pap.*, 2 : 42.

Diplatys himalayanus Baijal and Singh, 1954, *Agra Univ. J. Res. (Sci.)*, 3 (2) : 455, figs. 1-4 (3 nymphs not ♂ Holotype and Paratypes as stated) ; India : U. P., Nainital Dist., Jeolikote, Naranikarkana, 5500 ft.—Types at Zoological Survey of India, Calcutta)—Syn. n.

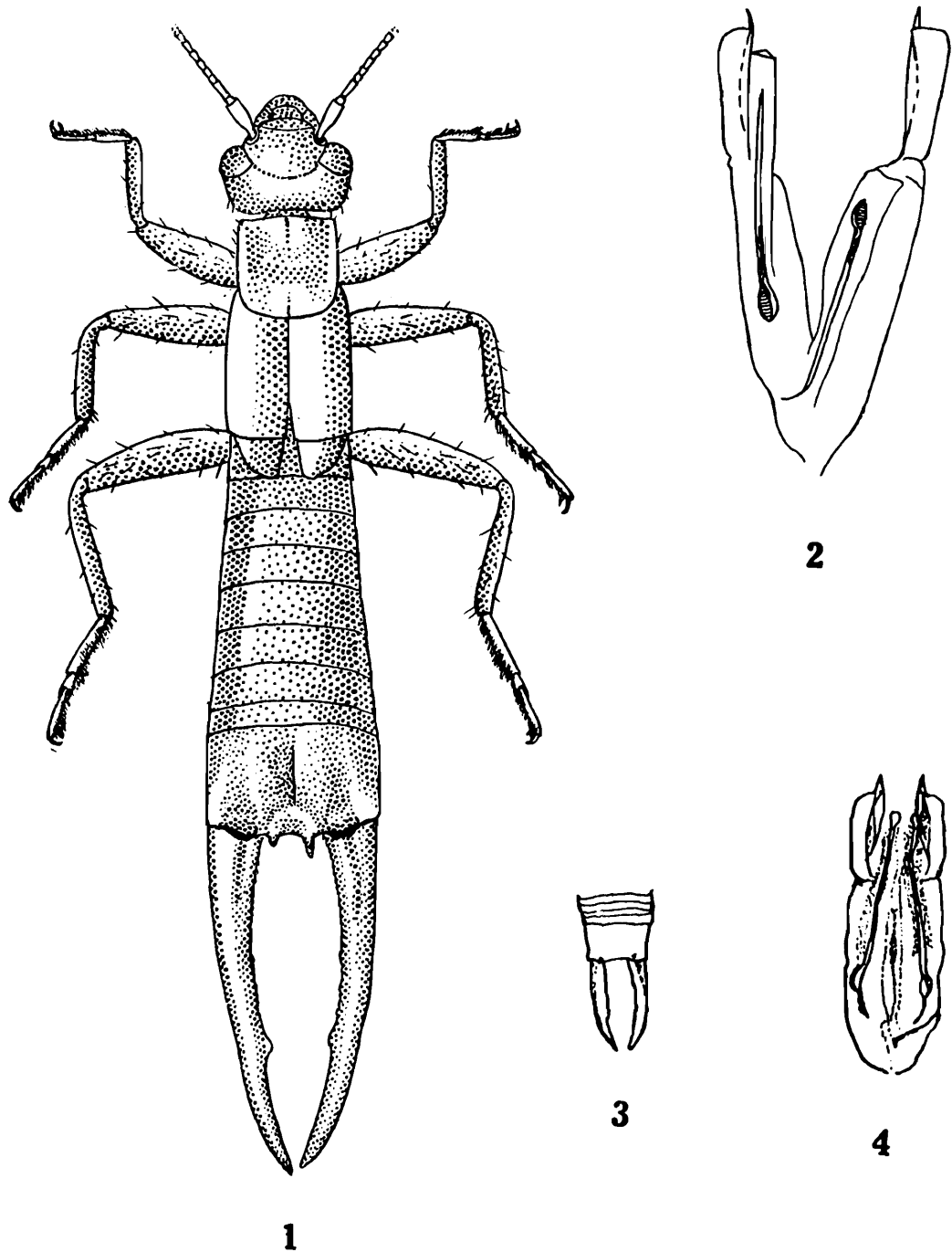
Spongiphora nainitalensis Baijal and Singh, 1954, *Agra Univ. J. Res. (Sci.)*, 3 (2) : 456, fig. 5-9 (♂, India : U. P., Nainital Dist., Jeolikote, Naranikarkana, 5500 ft.—Holotype in Zoological Survey of India, Calcutta)—Syn. n.

Erotosis jeolikotensis Baijal and Singh, 1954, *Agra Univ. J. Res. (Sci.)*, 3 (2) : 458, figs. 10-13 (♀ ; India, U. P., Nainital Dist., Jeolikote, Naranikarkana, 5500 ft.—Holotype at Zoological Survey of India, Calcutta)—Syn. n.

Elaunon nainitalensis Baijal and Singh, 1954, *Agra Univ. J. Res. (Sci.)*, 3 (2) : 460, Figs. 16-19 (♂ ; India : U. P., Nainital Dist, Jeolikote, Naranikarkana, 5500 ft.—Holotype at Zoological Survey of India Calcutta)—Syn. n.

Material examined : INDIA : ARUNACHAL PRADESH : Subansiri Dist., New Jenning, 100 m, 2 ♂♂, 1 ♀, 2 nymphs, 19. x. 1966, Siang Dist., Lekhabali, 50 m, 1 nymph, 2. x. 1966 (*S. K. Tandon & G. S. Arora*) ; ASSAM : Siliguri, Cachar, 1 ♀ (no further data) (*J. W. Mason*), Cherrapunji, Cantonment Hill, 1311 m, 1 ♂, 2 ♀♀, 20. ii. 1923, under stones in damp places (*S. L. Hora*) ; MANIPUR : Thagan Is., Logtak lake, 1 ♂, —. ii. 1926 ; WEST BENGAL : Darjeeling dist., Takdah, 1650 m, 1 ♀, 10.vii.1958 (*H. Khajuria*), Calcutta, near salt lakes, 1 ♀, —.v.1926 (*B. N. Chopra*) ; ORISSA : Chilka Lake, 1 ♂, 8 ♀♀, 14-22. ii. 1914 (No further data) ; MADRAS : Trichur, 1 ♀, 10. ix. 1914 (*F. H. Gravely*), Tuticorin, 1 ♂, 2. iii. 1926 (*R. B. S. Sewell*) ; KARNATAKA : Shimoga, Honali, Road, 2 ♀♀, 10. xii. 1928, amongst grass near edge of a tank (*H. S. Rao*) ; MAHARASHTRA : Satara dist., Kudali Valley, 835 m, 2 ♀♀, 28. iv. 1933,

(no further data) ; RAJASTHAN : Ajmer, Jaysagar, 1 ♂, 2 ♀ ♀, 13.viii.1965 (*S. Biswas*) ; PUNJAB : Kangra, Hamirpur, Baroli Village, 1 nymph, 7. i. 1963, Dharamshala, 1 ♂, 4 ♀ ♀, 5. i. 1963 (*R. K. Bhatnagar*) ; UTTAR PRADESH : Tehri Garhwal, Nrendra Nagar, 2 ♂ ♂, 1 ♀, 3. iii. 1967 (*T. D. Soota*) ; MADHYA PRADESH : Rewa, Sarrai, 1 ♀, 20. ii. 1927, at light (*H. S. Purthi*).



Figs. 1-4 : *Labidura riparia* (Pallas), ♂, 1. Dorsal view ; 2. Genitalia ; *Labidura dharchulensis* Gangola ♂ ; 3. Hind portion of body ; 4. Genitalia (Figs. 3 and 4 redrawn after Gangola, 1968).

BURMA : N. Shan States, 1 ♂, 12. xii. 1926 (*S. L. Hora*), Kamaing, Myitkyina, 1 ♀, 29. x. 1926 (*B. N. Chopra*).

AFGHANISTAN : Helmand River Valley, 6 ♀ ♀, 5. vi. 1955 at light (*Lweis E. Lang*), Field Museum of Natural History, Chicago, U.S.A.).

PHILIPPINE ISLANDS : Mindanao, Davao Province, Madaum, Tagum, 1♂, 10-14: x. 1946, sea level (*F. G. Werner*) (Field Museum of Natural History, Chicago, U.S.A.).

Brief description : ♂ : General colour varies from yellowish brown to dark blackish with various intermediate shades. Antennae, legs and wings generally testaceous.

Head convex, sutures faint or distinct ; eyes prominent but shorter than genae in length ; antennae 25-36 segmented. Pronotum slightly longer than broad, sides straight or often convex, posteriorly rounded. Abdomen punctulate, gradually enlarging posteriorly ; ultimate tergite transverse, smooth, disc convex, two sharp spines at posterior margin generally present, sometimes obsolete ; penultimate sternite obtusely triangular, hardly emarginate in middle posteriorly ; Forceps remote at base, keeled above for a short distance, long, cylindrical, tapering, internally toothed but their position extremely variable. Genitalia as seen in fig. 2.

♀ : Agrees with male but slightly smaller in size, abdomen dilated in middle ; ultimate tergite narrowed posteriorly ; forceps simple, straight and contiguous throughout.

Measurements : (in mm)

	♂	♀
Length of body	14-24	12-19
Length of forceps	4-10	3-5

Distribution : World wide.

Remarks : This an extremely variable species in general body colouration, size, shape of pronotum, texture and extent of elytra and wings, ultimate tergite and forceps, especially inner armature.

all these variations have been described in detail by Burr (1910), Hebard (1923). Besides Brindle (1966) has given in detail a list of synonyms. For this reason it has not been repeated here.

Baijal and Singh (1954) described four species namely, *Diplatys himalayanus* ; *Spongiphora nainitalensis* ; *Erotosis jeolikotensis* and *Elaunon nainitalensis*, on the material collected in one lot from the same locality and on the same date as is evident from their original descriptions. First one is based on three nymphs (not males) at various stages of development and other three are described on either male or female and belong to one and the same species. Types of all these four species present in the Zoological Survey of India, Calcutta were examined and found to represent individual variants of *Labidura riparia* and are treated here as synonyms.

Labidura dharchulensis Gangola

(Figs. 3-4)

Labidura dharchulensis Gangola, 1968, *Entomologist*, 101 : 59, figs. 6-11 (♂, ♀ ;
India : U. P., Pithoragarh, Dharchula, 915 m—location of type uncertain).

Brief description : ♂ : General colour brown to dark chestnut ; head light brown ; pronotum laterally yellow, prozona with two black spots posteriorly ; elytra and wings blackish chestnut ; legs yellow ; abdomen dorsally brown chestnut, darker laterally, ventrally in anterior half creamy white ; forceps yellow.

Head triangular, slightly longer than broad, moderately convex above. Eyes prominent but shorter than post-ocular length. Pronotum quadrate, slightly narrowed posteriorly, all margins straight, median sulcus distinct, prozona raised and metazona weakly depressed. Elytra well developed, granulated, costal margin with raised carina, meeting along the inner margin. Wings short, of same texture as the elytra. Legs normal. Abdomen spindle shaped. Ultimate tergite transverse, rectangular, gently narrowed posteriorly, hind margin trisinate, laterally above the branches of forceps oblique. Pygidium vertical, not visible from above. Forceps remote at base, gently curved, tapering apically, internal margin with one or two teeth in apical half and and crenulated in basal half. Genitalia as seen in fig. 4.

♀ : Agrees with male in most characters except that the ultimate tergite more strongly narrowed posteriorly and forceps simple and almost straight.

Measurements : (in mm)

	♂	♀
Length of body	11.5	10.5
Length of forceps	4.5	3.4

Distribution : Known from the type locality only.

Remarks : According to the original description (Gangola, 1968) the types should be available in the Zoological Museum of Th. D. S. B. Government College, Nainital. On enquiry there personally it has been confirmed they are not present there.

On the basis of original description and figs it agrees with smaller forms of *L. riparia* (Pallas). The figure of male genitalia shows that the distal lobes are flexed forward which perhaps represents these parts in exerted condition. It is not clear whether the apical portion of preputial sac is clubbed or that of virga. According to the description it is the former but diagram shows the latter. In any case, if former is

taken as correct it may not be of much taxonomic importance since during mounting muscles of preputial sacs often get arranged in various shapes.

However, the species is retained as valid for the present pending examination of types.

Genus *Forcipula* Bolivar

Forcipula Bolivar, 1897, *Ann. Soc. ent. Fr.*, 66 : 283.

Genitalata Kapoor, 1974, *Zool. J. Linn. Soc.*, 55 : 83, figs. 1-4 (Type—*Genitalata mahajani* Kapoor, 1974). **Syn. n.**

Type species : *Labidura quadrispinosa* Dohrn, 1863 (Designated by Kirby, 1904 : 8).

Diagnostic characters : Size medium to large (15-26 mm). Body elongated with fine pubescence. Head convex ; eyes shorter or longer than the area behind eyes ; antennae 20-40 segmented, third long and cylindrical, slightly shorter than 1st and longer than the rest, distal segments long and thin. Elytra well developed, often with a faint ridge laterally. Wings generally well developed, sometimes absent. Abdomen long, cylindrical, sides of certain segments in males with spines or crests, sometimes poorly developed or absent. Forceps in male long and slender, remote, curved or straight in basal half to two thirds afterwards bent inwards and straight, contiguous, remote basal part armed with a sharp tooth in middle or simply crenulate ; parameres with a small epimerite apically. Female forceps simple, straight, armed near apex internally with a sharp preapical tooth.

Distribution : Oriental Region and tropical parts of Africa and South America.

Remarks : Paratype 1 ♂ and the slide containing genitalia of *Genitalata mahajani* Kapoor were examined. Since it is a nymph with wing and tegminal pads clearly visible and 2nd tarsal segment Labidurid type, the genus *Genitalata* Kapoor, is placed as synonym. In having the tegminal pads somewhat rough, wrinkled and with a faint raised stripe laterally, it most likely represents an advanced nymphal stage of *Forcipula quadrispinosa* (Dohrn).

Key to the species (on ♂ ♂ only)

Following key does not include *F. leonardi* Steinmann. Since it is based on a female its taxonomic position is doubtful.

- 1 (6). Elytra with a weak ridge (represented by a convexity) along the costal margin and tuberculated

- 2 (5). General colouration yellowish brown ; eyes about as long as genae or longer ; sides of abdominal segments with an oblique, triangular crest
- 3 (4). Forceps with a single tooth internally at the point of bend ... *F. lurida* Bolivar
- 4 (3). Forceps with a pair of teeth internally at the point of bend ... *F. tuberculata* Srivastava
- 5 (2). General colouration blackish brown ; eyes much shorter than genae in length ; sides of abdominal segments with a sharp spine ... *F. quadrispinosa* (Dohrn)
- 6 (1). Elytra without a ridge along the costal margin, smooth or punctulate
- 7 (10). Body covered with dense, long and short pubescence
- 8 (9). Forceps with a sharp internal spine in the middle of basal remote portion in normal forms (in minor specimens tooth may be weakly developed or marked only by a faint protuberance) ; parameres apically acute ... *F. trispinosa* (Dohrn)
- 9 (8). Forceps with minute distantly placed teeth in basal remote part ; parameres more or less of uniform width with apex rounded ... *F. despinosa* (Hebard)
- 10 (7). Body covered with fine, comparatively sparse pubescence
- 11 (16). Sides of certain abdominal segments with a single spine on each side
- 12 (13). Forceps internally with a distinct spine, directed posteriorly, followed by a faint tubercle, at the middle of basal remote part ... *F. borellii* Chopard
- 13 (12). Forceps crenulate internally in basal remote part, without any sharp spine
- 14 (15). Sides of abdominal segments 3rd to 5th with a sharp spine ; forceps in basal remote part crenulate, terminating into a sharp point ; parameres apically blunt ... *F. aborensis* Brindle
- 15 (14). Sides of abdominal segments 3rd to 6th with a sharp spine ; forceps in basal remote part only crenulate : parameres with apex acute ... *F. indica* Brindle
- 16 (11). Sides of certain abdominal segments with a pair of spines, of unequal size ; often poorly developed
- 17 (18). Parameres comparatively narrower, of uniform width throughout, apex slightly obliquely truncate, apical epimerite curved ... *F. elongata* sp. n.

- 18 (17). Parameres comparatively broader, in apical one fourth a little narrower or broader, apical epimerite straight
- 19 (20). Head behind eyes parallel sided; pronotum longer than broad, elytra and wings well developed; parameres a little narrowed in apical one fourth with tip obtusely pointed ... *F. clavata* Liu
- 20 (19). Head behind eyes gently expanded; pronotum generally about as long as broad, rarely a trifle longer; parameres gently expanded in apical one fourth with tip broadly rounded ... *F. abbreviata* sp. n.

Forcipula abbreviata sp. n.

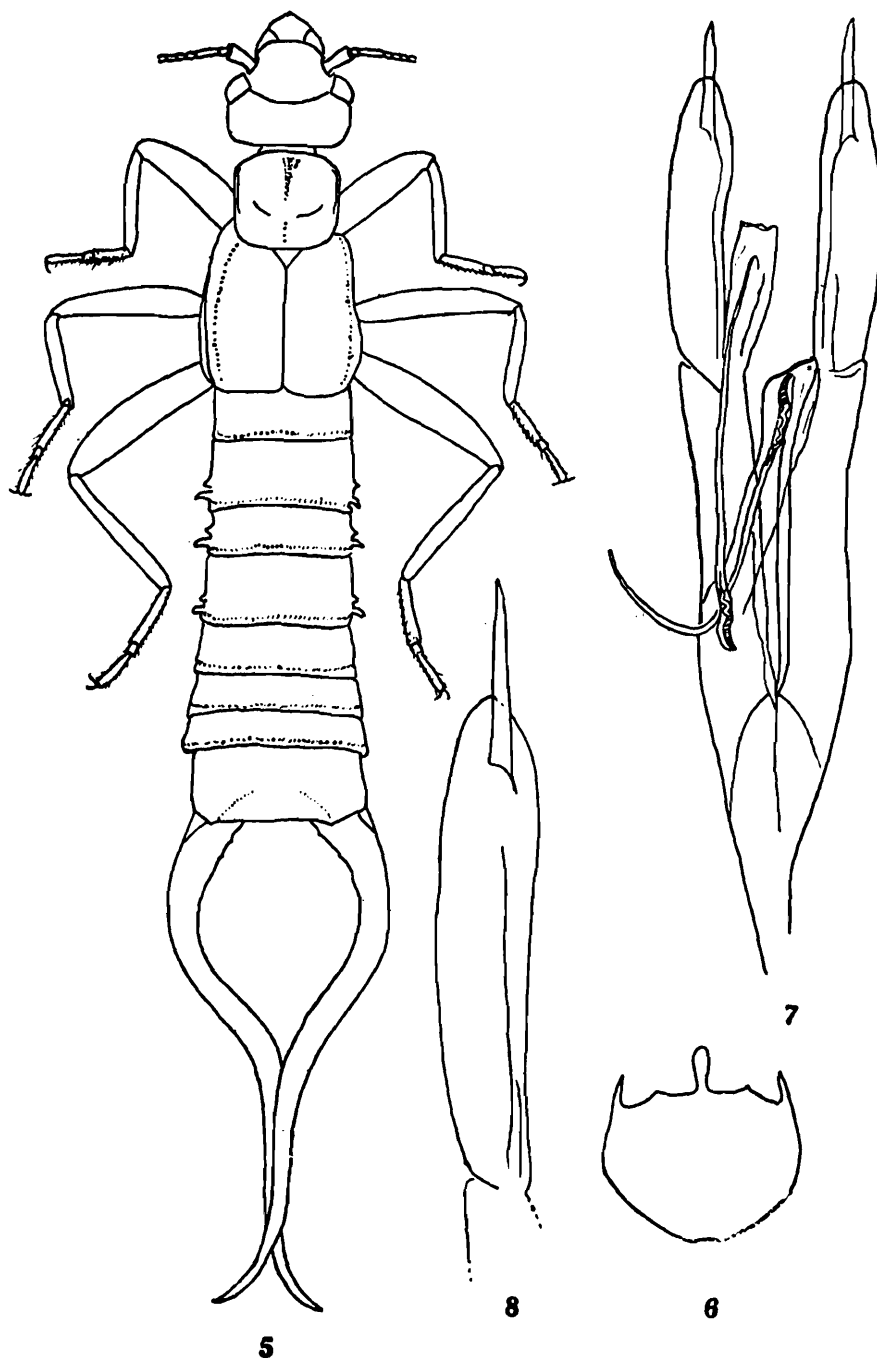
(Figs. 5-8)

Forcipula decolyi (néc Bormans), Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 289; Burr, 1905, *J. Asiat. Soc. Beng.* (N. S.) 1 : 27; Burr, 1906, *J. Asiat. Soc. Beng.* (N. S.), 2 : 207; Burr, 1910, *Fauna Brit. India, Dermaptera* : 91, pl. 3, figs. 25, 25a; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 : 186; Burr, 1911, *Genera Insect.*, 122 : 36; Burr, 1911, *J. Asiat. Soc. Beng.* (N. S.), 7 : 780; Kirby, 1904, *Syn. Cat. Orth.*, 1 : 9; Hebard, 1928, *Mem. Dep. Agric. India ent. Ser.*, 7 : 211; Borelli, 1921, *Rev. suisse Zool.*, 38 : 301; Boeseman, 1954, *Zool. Verh., Leiden*, 21 : 54; Bey-Bienko, 1959, *Ent. Obozor*, 38 : 609; Ramamurthi, 1968, *Ann. Mag. nat. Hist.*, (13) 6 : 675; Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 264; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 20; Srivastava, 1976 *Rec. zool. Surv. India Occ. pap.*, 2 : 43.

Material examined : INDIA : ARUNACHAL PRADESH : Kameng Dist., Dahang, Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen), Paratypes 2♂♂, 3♀♀, 1 nymph (forceps missing), 9. iii. 1973 (*S. K. Tandon* and *A. N. T. Joseph*); Bomdila Road, 6500 ft., Paratypes 2♂♂, 5♀♀, 2 nymphs, 18. iii. 1973; Sappen, 1800 m, Paratypes 3♂♂, 9♀♀, 13. iii. 1973; Birpur (Bomdila), 2♀♀, 8. iii. 1873; Dirang, 5000 ft., 2♂♂, 1♀, 11. iii. 1973; Tippi, 175 m, 1♀, 20. iii. 1973; Chanka Road, 1♀, 17. ii. 1973; (*S. K. Tandon* and *A. N. T. Joseph*); Dunn Bridge, 1524 m, 2♂♂, 2 nymphs, 21. iv. 1966 (*A. N. T. Joseph*); Ankling, 753 m, 4♂♂, 4♀♀, 1 nymph, 12. iii. 1961, Milankang, 2134 m., on river bank, two miles away from the road, 1♂, 18. iv. 1981, Pobrang Chu, 1829 m, 4♂♂, 1♀, 1 nymph, 22. iv. 1961, Baerali Kunda, 1 nymph, 4. iii. 1961 (*K. C. Jayaramkrishnan*); WEST BENGAL, Darjeeling Dist., Pashok, 3♂♂ (forceps with minor development), 20. xii. 1926, (*S. L. Hora*); SIKKIM, Singtam, 1515 m, 1♂, 5. iv. 1959, (*A. G. K. Menon*).

All types and other material deposited in the Zoological Survey of India, Calcutta,

Description : General colour dark brownish black, sides of pronotum lighter in colour, often elytra in middle close to sutural margin and branches of forceps reddish ; mouth parts, antennae and legs yellow or yellowish brown. Body finely pubescent.



Figs. 5-8 : *Forcipula abbreviata* sp. n., Holotype ♂, 5. Dorsal view ; 6. Penultimate sternite ; 7. Genitalia ; *Forcipula decolyi* (Bormans) Paratype ♂, 8. Paramere enlarged.

♂ : Head slightly longer than broad, sutures faintly marked, frons and occiput feebly raised, head gently widened behind eyes, hind margin convex with faint emargination in middle. Antennae 30-segmented or more, basal segment widened apically and shorter than the distance between antennal bases ; 2nd small, transverse ; 3rd long and slender, only slightly shorter than 1st ; 4th about as long as broad ; 5th to 6th

stout, cylindrical ; 7th onwards segments narrowed at base and expanded apically and gradually increasing in length, certain preapical segments long and thin. Eyes prominent, slightly shorter than the post-ocular length. Pronotum about as long as broad or a trifle longer, smooth, sides straight, feebly concave in middle, hind margin and angles rounded, median sulcus distinct ; prozona raised and metazona depressed. Legs typical for the genus. Elytra normal, feebly punctate, meeting along the sutural margin ; small scutellum visible. Wings abbreviated, concealed. Abdomen convex, enlarging posteriorly, hind margin of each tergite milled but milling weaker on anterior and posterior tergites, sides of segments 3rd to 5th provided with a pair of spines, of which dorsal one larger, triangular and directed laterally, ventral one smaller and stumpy. Penultimate sternite transverse, hind margin narrowed posteriorly and rounded ; manubrium shorter, about 1/5 as long as the sternite, about three times longer than broad. Pygidium vertical, triangular. Ultimate tergite transverse, smooth, hind margin straight in middle, oblique and concave laterally, median sulcus distinct. Forceps remote at base, with an oblique ridge at base above, afterwards branches depressed, curved in basal half enclosing an oblonge space, internal margin below tuberculated ; afterwards straight, contiguous, tapering with apices gently hooked and pointed. Genitalia as seen in fig. 7.

♀ : Agrees with male in most characters except that the penultimate sternite and ultimate tergite more narrowed posteriorly and forceps simple and straight, contiguous, internally crenulated with a large tooth at apical 1/3.

Measurements : (in mm)

	Holotype		
	♂	♂ ♂	♀ ♀
Length of body	25	17.2-21.5	24-25.6
Length of forceps	15	12.4-17.1	5-7

Distribution : All along the Himalayas in India, Nepal and Bhutan.

Remarks : This species was confused under *Forcipula decolyi* Bormans, known from New Guinea, but differs by the shape of forceps which lack on internal margin below a large, sharp, pointed, posteriorly directed tooth and the parameres somewhat more distinctly enlarged apically with tip rounded. In the latter (Paratype 1 ♂ examined, fig. 8) parameres are comparatively narrower apically with inner apical margin oblique and tip obtusely pointed.

All records of *F. decolyi* Bormans, from India, Burma, Nepal and Bhutan are referable to the described species barring those that are based on fully winged forms and belong to another species, *F. clavata* Liu, from China.

The body size varies greatly and in the smaller males lateral abdominal spines are poorly developed, occasionally represented by a small single spine on 4th and 5th tergites and the curvature of forceps in basal half is more elongated.

It occurs commonly along the banks of rivers and streams under stones, right from foot hills to higher elevations in Himalayas.

***Forcipula elongata* sp. n.**

(Figs. 9-10)

Forcipula decolyi (néc Bormans), Srivastava, 1970, *Eos, Madr.* 44 : 329 (2♂♂ India ; Tamil Nadu, Coimbatore Dist., Anamalai Hills, Cinchona, 3500 ft.).

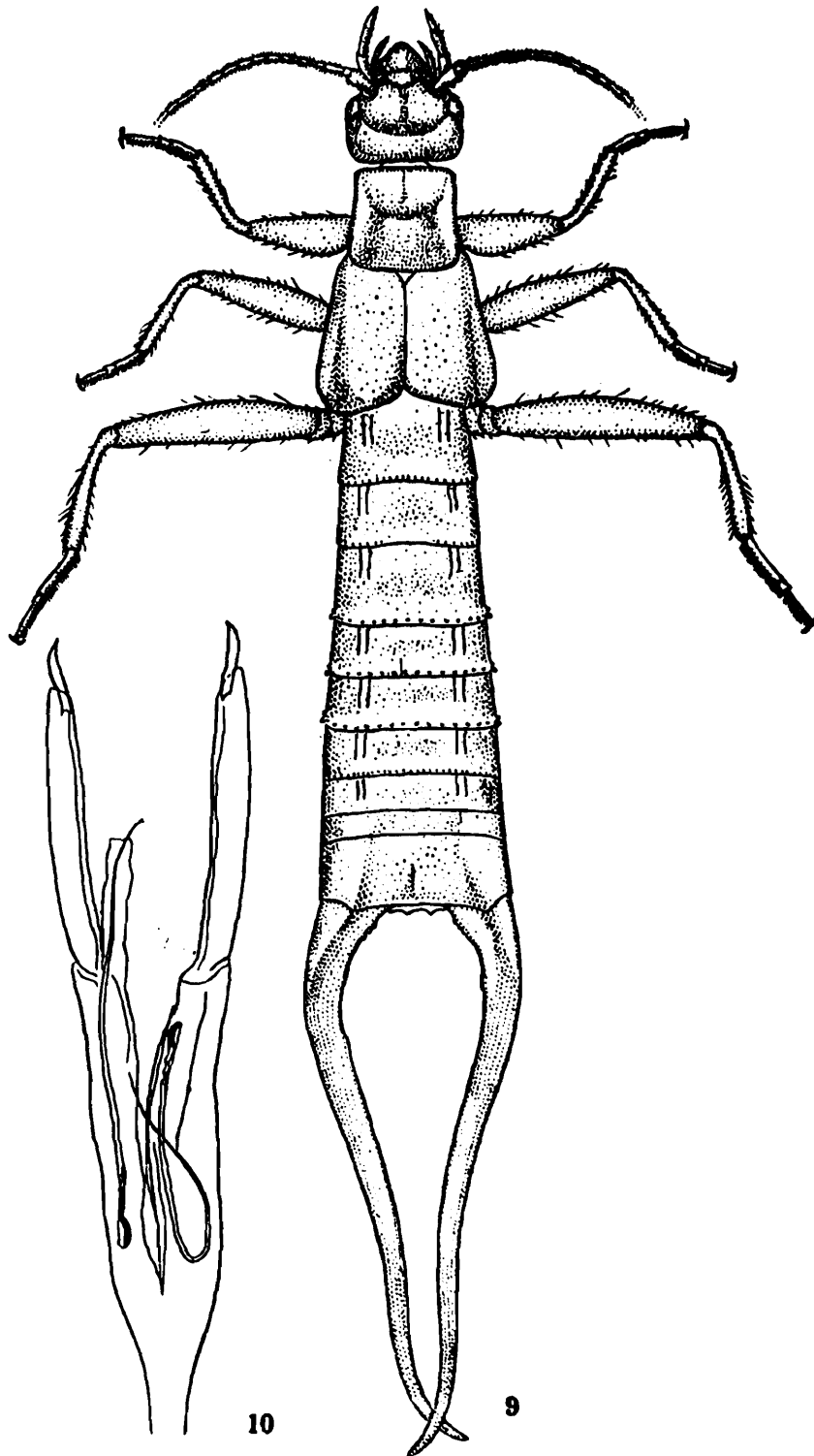
Material examined : INDIA : TAMIL NADU : Coimbatore Dist., Anamalai Hills, Cinchona, 3500 ft., Holotype ♂, Paratype ♂, May, 1968 ; (P. S. Nathan) ; det. by G. K. Srivastava as *Forcipula decolyi* Bormans ; genitalia of both the specimens mounted between two coverslips and attached with pins of respective specimens ; KERALA : Kottayam Dist. Kuttikkanum, 1 ♂, 1 ♀, 1 nymph, 27.xii.1970 and 1.i.1971 ; Elappara, 1 ♀, 27.xii.1970 (A. N. T. Joseph and M. S. Shishodia).

Types and other material deposited in the collections of the Zoological Survey of India, Calcutta.

Description : ♂ : General colour dark brownish black with slight variation to dark brown on certain body parts. Antennae blackish brown with 3rd segment in basal two thirds and legs yellowish brown, knee joints and femora very feebly shaded with fuscus patch. Pubescence short and fine, spread all over the body, on ultimate tergite and forceps sparse.

Head slightly longer than broad, weakly convex, at the junction of sutures with a feeble depression, region behind eyes parallel sided, sutures fine, hind margin hardly sinuate in middle. Eyes shorter than the post-ocular length. Antennae multisegmented (apical portion broken) ; 1st stout, narrowed basally, shorter than the distance between antennal bases, 2nd transverse ; 3rd slender, slightly longer than combined length of 4th and 5th ; 5th slightly longer than preceding, remaining gradually increasing in length, apical ones very thin, almost rod shaped. Pronotum punctulate, slightly longer than broad, a trifle broader posteriorly, sides feebly emarginate in middle, anterior and

posterior margins straight, postero-lateral angles well rounded, prozona tumid with a small depression on either side of median line, metazona depressed, well differentiated from prozona by a faint depression, median suture represented by a smooth line: Elytra well developed,



Figs. 9-10. *Forcipula elongata* sp. n., Holotype ♂, 9. Dorsal view ; 10. Genitalia.

punctulate, humeral angle weak, meeting along the inner margin, hind margin feebly oblique. Wings wanting. Legs normal. Abdomen convex, gently dilated posteriorly, tergites with fine micro-reticulations and a pair of elongated smooth patches sublaterally, milled along the hind margin, milling (like that of coin on its edge) weaker or almost

obsolete on last one or two tergites, sides of segments 4th to 6th with a pair of tubercles, of which ventral one very small and dorsal one larger and lobular. Penultimate sternite obtuse posteriorly, in middle with a slight emargination, along the median line in apical half a raised stripe present. Ultimate tergite smooth, strongly transverse, faintly depressed in middle posteriorly, median suture distinct, hind margin between branches of forceps straight and laterally concave and oblique. Forceps elongated, strongly bowed inwards in basal half, afterwards more or less straight or gently undulate but sub-remote, strongly tapering posteriorly with apices gently hooked, at base above with an oblique ridge, internally in basal half with a few crenulations, otherwise smooth. Parameres (fig. 10) long and narrow, tip obliquely truncate and apical epimerite curved.

♀ : Agrees with male in most characters except that size smaller, penultimate sternite distinctly triangular, ultimate tergite strongly narrowed posteriorly, forceps simple and straight, internal margin crenate and with a preapical tooth.

Measurements : (in mm)

	Holotype	Paratype		Others
	♂	♂	♂	♀ ♀
Length of body	2.4	2.5	2.2	1.4-1.5
Length of forceps	1.6	1.65	1.4	0.5-0.5

Distribution : Known from the type locality only.

Remarks : This species has a close resemblance with *F. abbreviata* sp. n., in having a pair of spines on the sides of certain abdominal segments but differs by the shape of spines in being lobular especially the dorsal one and ventral one very much reduced ; parameres comparatively narrower with apical epimerite curved.

Forcipula clavata Liu

(Figs. 11-14)

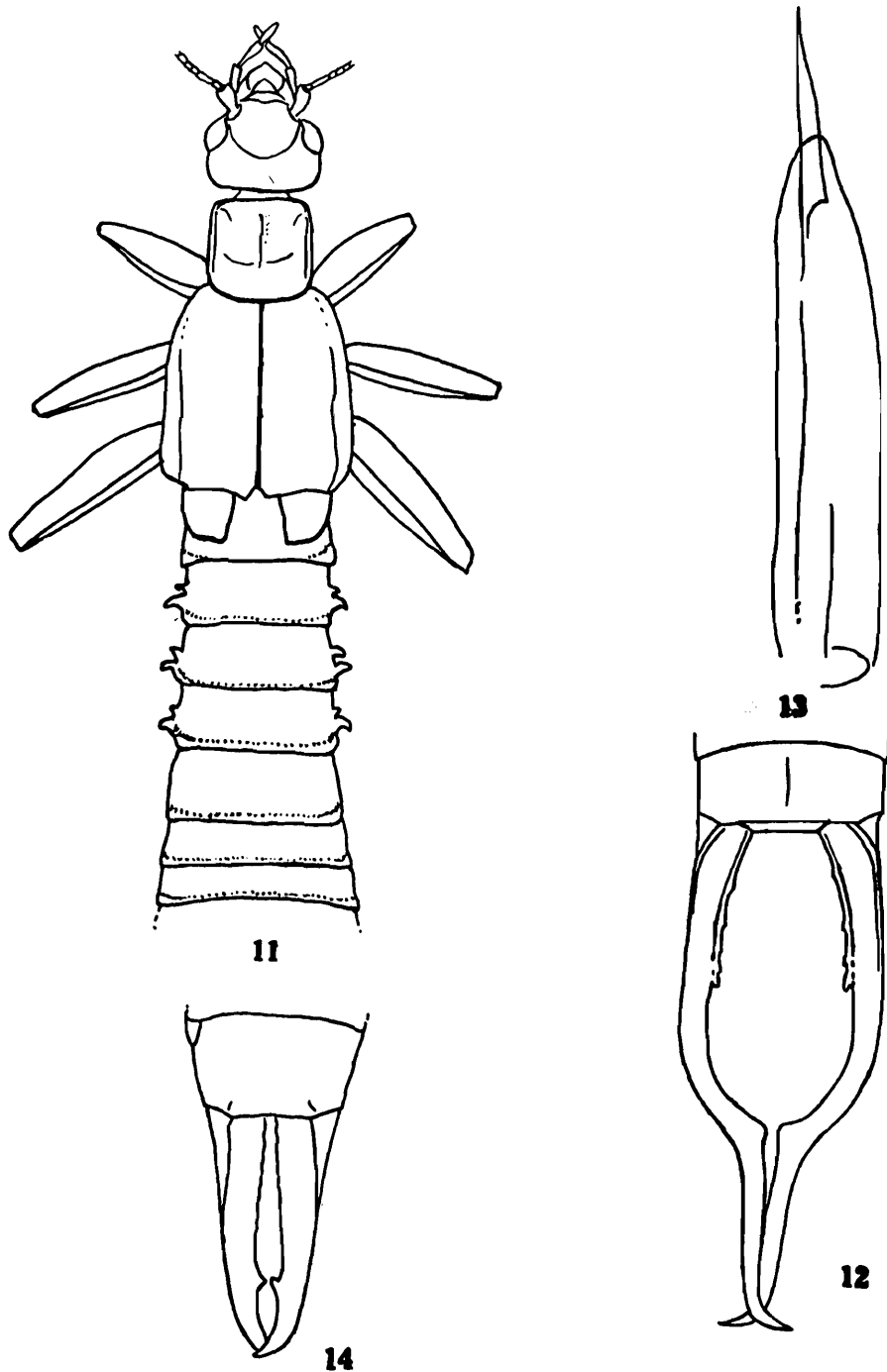
Forcipula clavata Liu, 1946, *J. W. China Border Res. Soc.*, 16 : 22, pl. 2, fig. 8 (♂, ♀ ; China : Pan-Chi, Peh-Chi in Chungking—Types at Museum of Zoology, National Central University, China) ; Bey-Bienko, 1959, *Ent. Obozor*, 38 : 609.

Forcipula decolyi var. *longipennis* Borelli, 1912, *Bull. Mus. Hist. nat. Paris*, 18 : 224 (♂, Tonkin ; Boa-Lac).

Forcipula clavata var. *unica* Liu 1946, *J. W. China Border Res. Soc.*, 16 : 23, pl. 2, fig. 10 (♂, China ; Pan-Chi, Peh-Chi in Chungking—coll. in Museum of Zoology, National Central University, China) ; Boy Bienko, 1959, *Ent. Obozor*, 38 : 609.

Forcipula obscura Steinmann, 1980. *Acat. zool. Acad. Sci. Hung.*, 21 (1-3) : 250, figs. 47-48 (♂ ; Vietnam—Hungarian Natural History Museum, Budapest, Hungary)—Syn. nov.

Material examined : INDIA : ARUNACHAL PRADESH : Subansiri Dist., Bela village, Daporijo, 150 m, 10 ♂♂, 18 ♀♀, 8 nymphs, 27.x.1966, Pakha Camp, 150 m, 2 ♂♂, 8 ♀♀, 31 nymphs (at different instars), 26.x.1966, Siang dist., Basal village, 550 m, 2 ♂♂, 1 ♀, 31.x.1966,



Figs. 11-14 : *Forcipula clavata* Liu, ♂, 11. Anterior portion of body ; 12. Ultimate tergite and forceps ; 13. Paramere ; ♀, 14. Ultimate tergite and forceps.

Lekhabali, 50 m, 1 ♂, 4 ♀♀, 11 nymphs, 2.x.1966, Bame village, 600 m, 1 ♂, 7 nymphs, 30.x.1966, Subansiri Bridge, 150 m, 2 ♀♀, 1 nymph, 28.x.1966 (S. K. Tandon & G. S. Arora) ; Lohit Dist.,

Wakro, 1700 ft., 2 ♂♂, Daphabum Expedition, Z. S. I., 2-3.xii.1969 (J. M. Julka); Tirap dist., Changlong, 2 ♂♂, 2 ♀♀ (in one ex. abdomen missing), 15. i.1962, Miao, 1 ♂, 1 ♀, 26.i.1962, Nampong, 1 ♀, 2.iii.1962 (C. B. Srivastava).

Brief description : General colour dark brown to blackish brown; sides of pronotum, legs and wings along the internal margin in apical half testaceous yellow. Elytra and forceps somewhat reddish. Body finely pubescent.

♂ : Head longer than broad, sutures distinct, smooth, frons and occiput moderately convex, post-ocular margin parallel, hind margin straight, with faint emargination in middle. Eyes shorter than the post-ocular length of head. Antennae typical for the genus. Elytra and wings well developed, former feebly punctate. Legs normal. Abdomen gradually dilated posteriorly, each tergite milled along the hind margin, sides of segments 3rd to 5th with a pair of spines of which dorsal one larger and hooked. Penultimate sternite transverse, hind margin rounded with a faint emargination in middle. Ultimate tergite transverse, median sulcus distinct. Pygidium vertical, triangular. Forceps curved or broadly so in basal half and contiguous, tapering and straight in apical half; internally crenulate below, basal half of curved part, ending into a sharp teeth. Paramere as seen in fig. 13.

♀ : Agrees with ♂ in most characters except that the penultimate sternite and ultimate tergite more narrowed posteriorly; forceps simple and straight, trigonal in basal one third, internally crenulate with a triangular teeth at apical one third.

Measurements : (in mm)

		♂♂	♀♀
Length of body	—	20-25	23-25.5
Length of forceps	—	12-17	5.5-7.1

Distribution : India (Arunachal Pradesh, Meghalaya) and China (Chungking).

Remarks : In some specimens, spines on the sides of abdominal segments 4th and 5th are very much reduced or totally absent on 3rd and the branches of forceps are almost straight, only slightly undulate in middle. Liu (1946) records wings as yellow but in the present series before me wings are brownish with inner margin in apical half and tip yellowish.

This species was considered as synonym of *F. decolyi* Bormans by Bey-Bienko (1959) but it is now resolved that latter is endemic to New Guinea and the material referred under this name from India and

adjacent countries consists of two distinct species—one described as new in the preceding pages and the other *F. clavata* Liu, hitherto known from China.

It can be easily separated from the above two species viz., *F. decolyi* Bormans and *F. abbreviata* sp. n. by the shape of pronotum being longer than broad ; presence of well developed wings and distinctive paramers which are narrowed apically with tip obtusely pointed.

***Forcipula borellii* Chopard**

(Figs. 15-16)

Forcipula borellii Chopard, 1924, *Rec. Indian Mus.*, 26 (1) : 90, pl. 5, figs. 35-41 (♂, ♀ ; Siju Cave, Garo Hills—Types in the Zoological Survey of India, Calcutta) ; Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 263 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 21 ; Srivastava, 1966, *Rec. zool. Surv. India Occ. pap.*, 2 : 43.

Material examined : INDIA : MEGHALAYA : Garo Hills, Siju Caves, *Types* 1 ♂ (genitalia mounted between two coverslips and pinned with the specimen), 1 ♀, *Cotypes*, 1 ♂, 2 ♀ ♀, 9 nymphs, —. ii. 1922, at entrance or 91 m. inside (*S. W. Kemp & B. N. Chopra*) (The whole of the material is discoloured since it was preserved in spirit).

Brief description : ♂ : General colour dark blackish brown ; finely pubescent.

Head somewhat depressed, sutures weakly marked ; eyes prominent, only slightly shorter than genae ; antennae 31-segmented. Pronotum longer than broad, laterally faintly emarginate, reflexed, hind margin rounded. Elytra well developed, finely punctulate, truncate posteriorly ; a small scutellum visible ; wings abbreviated. Abdomen gradually expanded posteriorly, sides of segments 3rd to 5th with a sharp and hooked spine, on 6th segment a small tubercle present (absent in Cotype) ; penultima sternite subtruncate in middle posteriorly. Ultimate tergite, forceps and genitalia as seen in figs. 15-16.

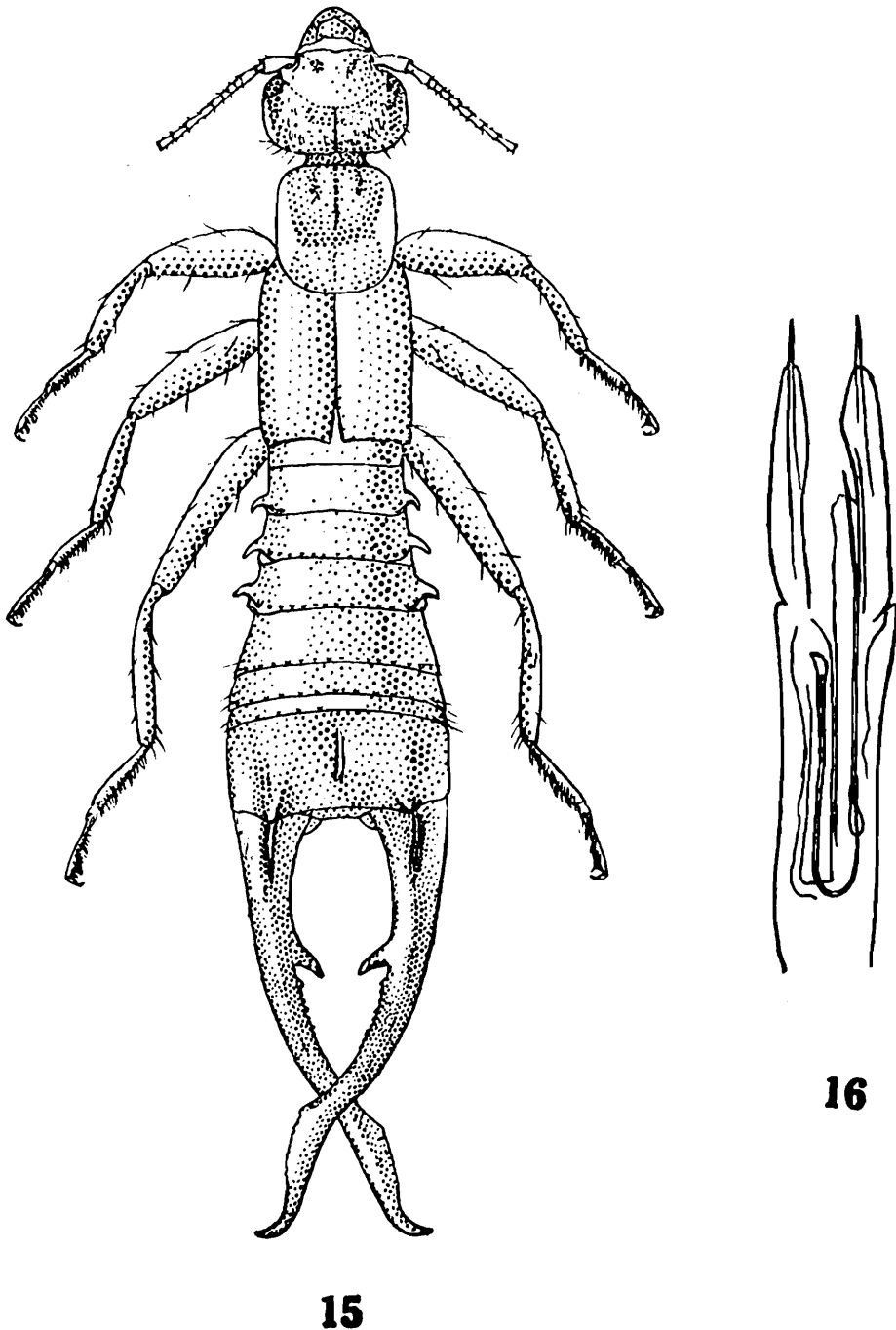
♀ : Agrees with male in most characters except that sides of abdominal segments without spines ; ultimate tergite narrowed posteriorly ; forceps simple, contiguous and straight, inner margin crenulate in basal half, afterwards unarmed except for a blunt tooth near apical one third.

Measurements : (in mm)

	♂ ♂	♀ ♀
Length of body	12.8-15.1	14.9-16.7
Length of forceps	7-8.5	4.2-4.8

Distribution : India (Assam).

Remarks : This species is known by its type series only. The male genitalia is figured here for the first time.



Figs. 15-16 : *Forcipula borellii* Chopard, Type (Holotype) ♂, 15. Dorsal view ; 16. Genitalia.

***Forcipula trispinosa* (Dohrn)**

(Figs. 17-19)

Labidura trispinosa Dohrn, 1863, *Stettin ent. Ztg.*, 24 : 310 (♂, India Oriental—Location of types uncertain ; 1♂ stated to be paratype (Steinman, 1980) present at Hungarian Natural History Museum, Budapest, Hungary).

Forcipula trispinosa : Bormans and Krauss, 1900, *Das Tierreich*, Tief 11 : 30 ; Kirby, 1904, *Syn. cat. Orthoptera*, 1 : 9 ; Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 :

289 ; Burr, 1905. *J. Asiat. Soc. Beng.* (N. S.), 1 : 27 ; Burr, 1907, *Bull. Mus. Hist. nat. Paris*, 1907 : 207 ; Burr, 1910, *Fauna Brit. India, Dermaptera* : 92, pl. 3, fig. 26 ; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 : 186 ; Burr, 1911, *Genera Insect.*, 122 : 38 ; Burr 1914, *Rec. Indian Mus.*, 10 : 289 ; Chopard, 1924, *Rec. Indian Mus.*, 26 (1) : 89 ; Bharadwaj and Bhatnagar, 1961, *Zool. Anz.*, 167 (7-8) : 283 ; Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 268 ; Brindle, 1967, *Acta Mus. Moraviae*, 52 : 209 ; Kapoor, 1968, *Agra. Univ. J. Res. (Sci.)*, 16 (1) : 20 ; Srivastava, 1976, *Rec. zool. Surv. India Occ. pap.*, 2 : 44 ; Steinmann, 1980, *Acta zool. Acad. Sci. Hung.*, 26 (1-3) : 242, figs. 26, 27.

Labidura (?) *pugnax* Kirby, 1891, *J. Linn. Soc. (Zool.)*, 25 : 510, pl. 12, fig. 1 (♂, ♀ ; North India—Type at British Museum (Natural History), London).

Forcipula trispinosa var. *minor* Burr, 1910, *Fauna Brit. India Dermaptera* : 93, pl. 3, fig. 260 (♂, Nepal) ; Burr, 1910, *Trns. R. ent. Soc. Lond.*, 1910 : 186 ; Burr, 1911, *Genera Insect.*, 122 : 38 ; Bharadwaj and Bhatnagar, 1961, *Zool. Anz.*, 167 (7-8) : 284.

Forcipula trispinosa sub. sp. *minor*, Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 268.

Forcipula afghana Steinmann, 1980, *Acta zool. Acad. Sci. Hung.*, 26 (1-3) : 243 (♂ ; Afghanistan : Hindukush and Nuristan—Types at Hungarian Natural History Museum, Budapest, Hungary) **Syn. n.**

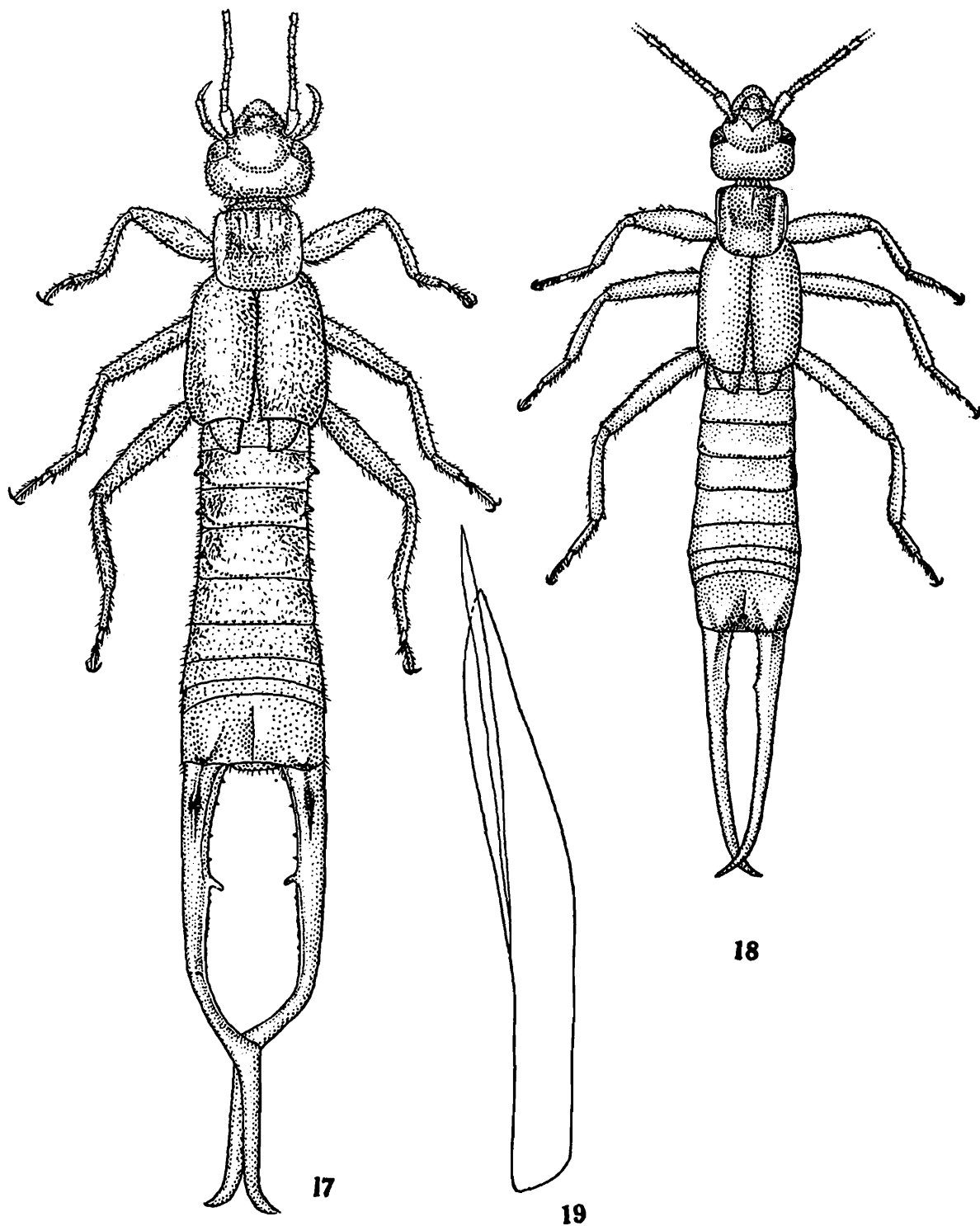
Material examined : INDIA : ARUNACHAL PRADESH : Kameng dist., Dirong Dizong village, 1600 m, 2 ♀ ♀ , 11.iv.1961, Diefam village, 274 m, 1 ♂ , 21. v. 1961 (*K. C. Jayaramakrishnan*) ; ASSAM, Shillong, 1 ♂ , 15. xi. 1930 (*H. S. Rao*) ; WEST BENGAL, Calcutta, 2 ♂ ♂ , 1 ♀ , 1. iv. 1907, 4. 12. xi. 1906 (*C. Paiva*, det. by Burr as *F. pugnax* Kirby) ; PUNJAB, Dharampur, Simla Hills, 1524 m, 2 ♂ ♂ , 3 ♀ ♀ , 6, 8. v. 1907 (*N. Annandale*) ; UTTAR PRADESH, Nainital dist., Boxar, 1 ♀ , 19. iv. 1908, Kotah, 2 ♂ ♂ , 3 ♀ ♀ , 1 nymph, 5. v. 1908 (*R. N.*), Nainital, 1 nymph, 29.xi.1907 (*Mus. Collector*).

NEPAL : Pharping, 1 ♂ , 2 ♀ ♀ , 1 nymph (one ex. broken) (no further data), Soondrijal, 4 ♀ ♀ (no further data), Chitlong, 1 ♂ , 1 ♀ (no further data) (*Ind. Mus.*), Butal, 1 ♂ , 12. ii. 1908 (*Mus. Collector*).

Brief description : ♂ : General colour blackish brown, shining ; antennae, sides of pronotum, inner wing tips yellowish. Finely pubescent.

Head convex, sutures faint ; eyes smaller than genae in length ; antennae 30-segmented or more. Pronotum as broad as long, hind margin rounded, median sulcus distinct. Elytra pubescent, ample, humeral angles prominent, smooth, wings lacking pubescence, otherwise same as elytra, about as long as pronotum. Abdomen generally expanding from base to apex, sides of segments 3rd to 5th with a sharp spine, of which spine on the segment 5th shorter than others. Penultimate sternite with hind margin obtuse. Ultimate tergite, forceps and genitalia as seen in figs. 17-19.

♀ : Agrees with male but body densely pubescent ; ultimate tergite narrowed posteriorly ; forceps with branches simple and straight with apices pointed, gently hooked, inner margin crenulate with a weak tooth at apical one third.



Figs. 17-19 : *Forcipula trispinosa* (Dohrn), ♂ ; 17. and 18. Dorsal view ; 19. Paramere.

Measurements : (in mm)

	♂ ♂	♀ ♀
Length of body	15.5-22.5	14-28
Length of forceps	6-15	5.7-9

Distribution : India and Nepal (all along the Himalayas).

Remarks : Sometimes branches of forceps are almost straight or gently undulate with the inner tooth poorly developed or wanting. Sides of abdominal segments also lack lateral spines or occasionally only trace of the tooth is visible. Such specimens have been referred to by Burr (1910) as var. *minor* of this species.

Forcipula indica Brindle

(Figs. 20-21)

Forcipula pugnax (néc Kirby), Burr, 1910, *Fauna Brit. India Dermaptera* : 93, pl. 3, fig. 27 ; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 : 186 ; Burr, 1911, *Genera Insect.*, 122 : 38.

Forcipula indica Brindle, 1966, *Ann. Mag. nat. Hist.*, (19) 9 : 265 (♂♂, Bhutan and India—Holotype in British Museum (Natural History), London) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 21 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. pap.*, 2 : 43.

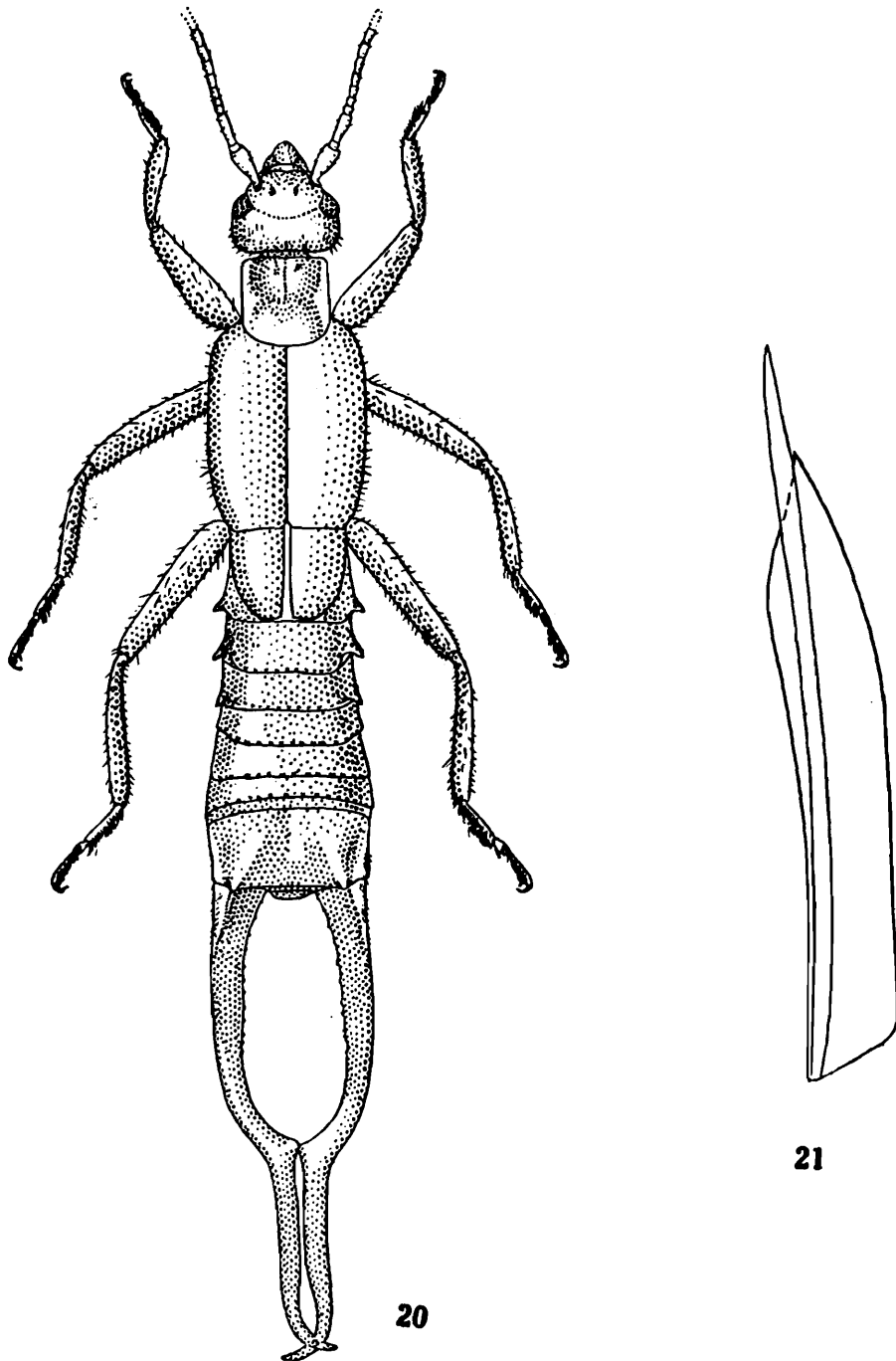
Material examined : INDIA : ARUNACHAL PRADESH : Kameng dist., Foot Hills, 2 ♂♂, 5 ♀♀, 1 nymph, 27.ii.19761 (*K. C. Jayarama-krishnan*) ; MEGHALAYA, Shillong, 1 ♂, 3-9.xii.1930 (*H. S. Rao*), Goalpara dist., Jamduar, 1 ♂, 1 ♀, -iii.1957 ; WEST BENGAL, Darjeeling dist., Nayabazar, 1 ♂, 1 ♀, 22.ix.1959 (*B. K. Tikader*), Pashok, 610 m, 3 ♂♂ (1 ex. damaged), 2 ♀♀, 1 nymph, 20.xii.1926, (*S. L. Hora*) ; SIKKIM, Chongpung, 1 ♂, 27.ix.1959, Tingling, 1 ♀, 28.x.1959 (*B. K. Tikader*).

Brief description : ♂ : General colour shining blackish brown, antennae, legs, sides of pronotum and inner margin of wings yellow. Finely and densely pubescent except wings, ultimate tergite and forceps.

Head slightly longer than broad, sutures faint or distinct ; eyes much shorter than genae in length ; antennae 35-40-segmented. Pronotum longer than broad, sides straight and gently reflexed, hind margin briefly rounded, median sulcus distinct ; prozona tumid, metazona less so. Elytra three times longer than the pronotum, punctulate, humeral angles prominent, hind margin very slightly truncate, oblique ; wings about as long as pronotum, smooth. Abdomen punctate, gradually expanding posteriorly, sides of segments 3rd to 6th with a sharp spine, of which on the segment 6th often very much reduced in the form of a tubercle ; penultimate sternite triangular with posterior margin scarcely emarginate in middle. Ultimate tergite, forceps and parameres as seen in figs. 20-21.

♀ : Agrees with male in most characters but pubescence more thick ; sides of abdominal segments lack spines ; ultimate tergite gently

narrowed posteriorly ; forceps simple, straight, tapering to pointed and gently incurved apices which meet, inner margin with a weak tooth at apical one third.



Figs. 20-21 : *Forcipula indica* Brindle, ♂, 20. Dorsal view ; 21. Genitalia.

Measurements : (in mm)

	♂	♀
Length of body	22-26	21.5-27
Length of forceps	11-17	7.5-8.5

Distribution : India, Nepal and Bhutan.

Remarks : Often in some males the forceps are straight and provided internally at about middle with a weak tubercle.

Occasionally individuals with minor developments are met with which are smaller in size and are normally devoid of spines of the sides of abdominal segments. Forceps are almost straight, sometimes only a little undulate at about middle.

The female is described here for the first time.

Forcipula aborensis Brindle

(Figs. 22-23)

Forcipula pugnax (néc Kirby), Burr, *Rec. Indian Mus.*, 8 (2) : 139.

Forcipula aborensis Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 262 (♂, Near Dosing, 1400 ft., Shimang R.—Holotype ♂ in British Museum (Natural History), London); Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 21; Srivastava, 1966, *Rec. zool. Surv. Inaia Occ. pap.*, 2 : 42.

Material examined : INDIA : ARUNACHAL PRADESH : Siang dist., near Doshing, Shimang River, 427 m, 1 ♂, 29.i.1912, Yembung Stream, 335 m., 2 ♂♂, 2 ♀♀, 1 nymph, 13-17.i.1912, Yembung, bank of Dhiong River, 335 m, 1 ♀, 13.i.1912, under stones, Janakmukh, 183 m, 1 ♀, 17.i.1912, Rotung, bank of Sireng Stream, 1 ♀, 28. xii. 1911; ASSAM : Sadyia, 1 ♂, 26. xii. 1911, under bark (*S. W. Kemp*) (det. by M. Burr as *F. pugnax* Kirby).

Brief description : ♂ : General colour dark brownish black, antennae and legs testaceous, finely pubescent.

Head slightly longer than broad, sutures distinct, hind margin straight; eyes about half as long as genae; antennae 35-segmented. Pronotum longer than broad, hind margin rounded, median sulcus distinct in apical half; prozona tumid and well differentiated from flat metazona. Abdomen gradually dilated posteriorly, sides of segments 3rd to 5th with a single hooked spine, on 5th segment spine very much reduced. Ultimate tergite, forceps and genitalia as seen in figs. 22-23.

♀ : Agrees with male in most characters but slightly shorter in size; ultimate tergite narrowed backwards; forceps with branches straight, apices gently incurved and crossing, internally finely crenulate with a distinct tooth near apex.

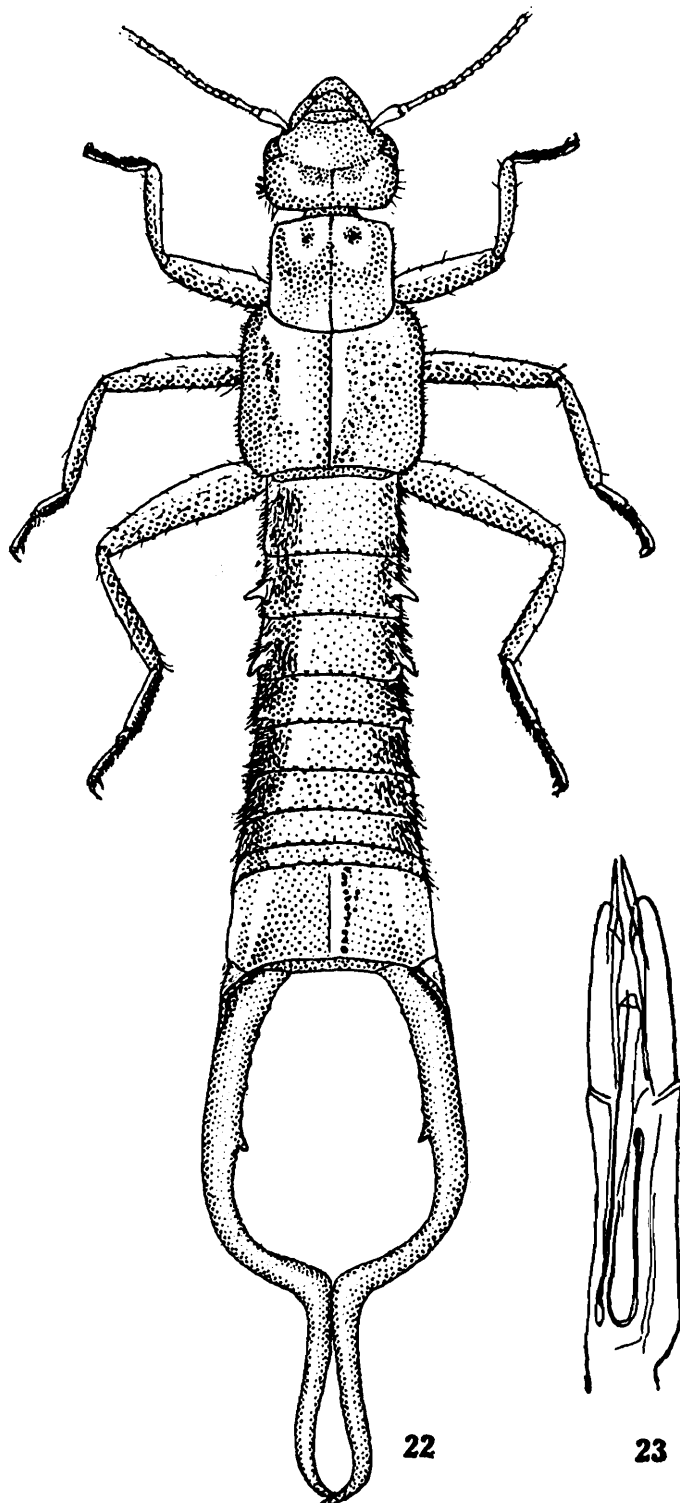
Measurements : (in mm)

	♂♂	♀♀
Length of body	21-26	18-21.5
Length of forceps	12.6-15.5	6.5-7

Distribution : India : Arunachal Pradesh, Siang dist. (as above under the material examined).

Remarks : This species is apparently closely related to *F. abbreviata* and *F. clavata* Liu, but differs in having a single thorn like spine on the sides of abdominal segments 3rd to 5th besides the characteristic parameres.

The female is described here for the first time.



Figs. 22-23 : *Forcipula aborensis* Brindle, ♂, 22. Dorsal view ; 23. Genitalia.

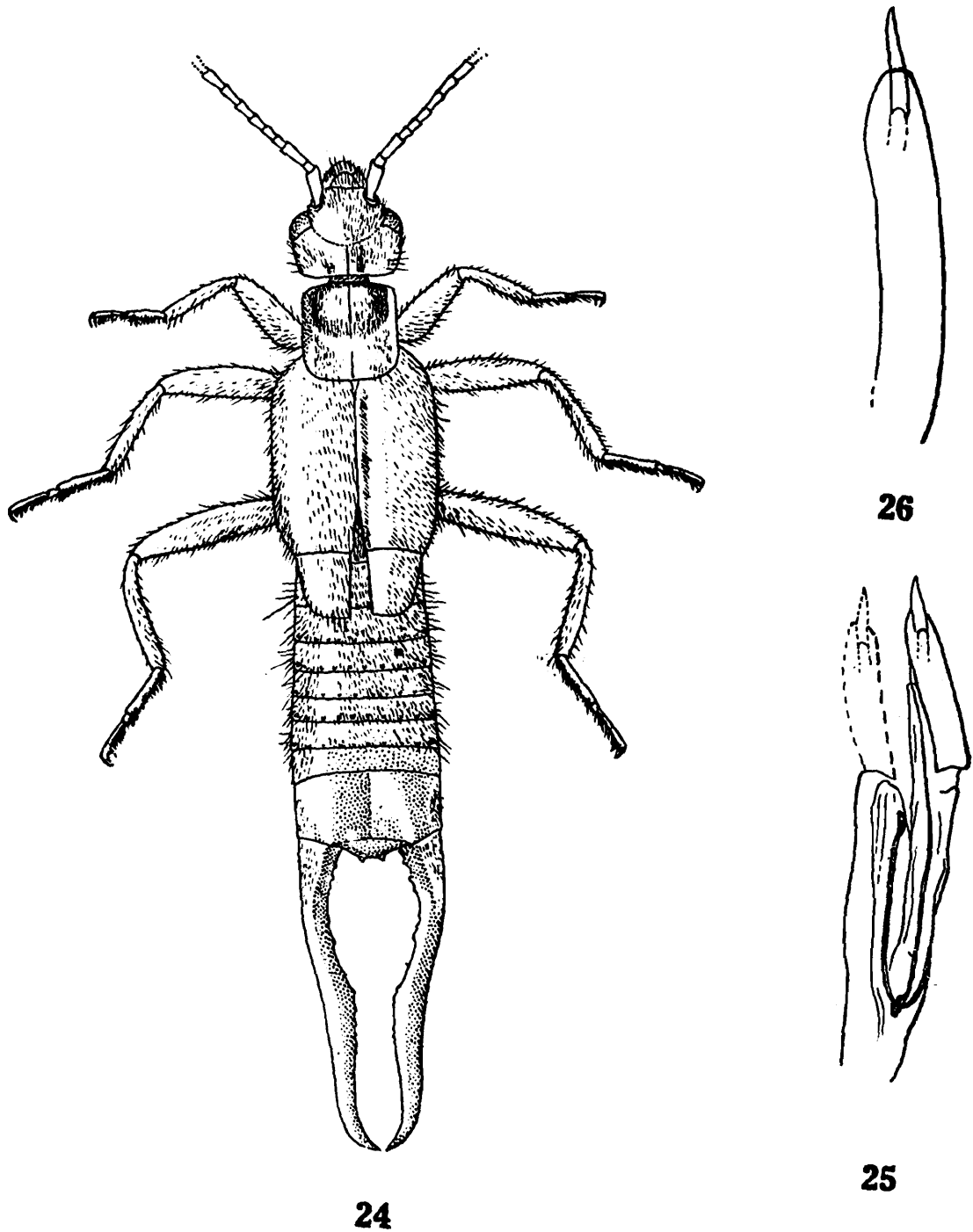
***Forcipula despinosa* Hebard**

(Figs. 24-26)

Forcipula despinosa Hebard, 1917, *Proc. Acad. nat. Sci. Philad.*, 69 : 234, pl. 16, fig. 1 (♂ ; North India—Type at Entomology Department, Philadelphia Academy of Sciences, Philadelphia, PA, U. S. A.),

Material examined : Holotype ♂, Northern India (No. 437, Philadelphia Academy of Sciences, Philadelphia).

Brief description : General colour dark brown, forceps slightly reddish, antennae and legs yellowish ; strongly pubescent.



Figs. 24-26 : *Forcipula despinosa* Hebard, Holotype ♂, 24. Dorsal view ; 25. Genitalia ; 26. Paramere enlarged.

Head slightly longer than broad, frons and occiput weakly raised, sutures faint, hind margin straight. Eyes about half as long as the genae. Antennae (partly broken ; 10 segments remaining on the left side) with 1st segment stout, clavate ; 2nd small ; 3rd long and slender, only slightly shorter than 1st ; 4th and 5th subclavate, remaining gradually increasing in length and becoming more slender distally.

Pronotum slightly longer than broad, anterior margin convex, sides depressed and straight, hind margin briefly rounded ; prozona weakly tumid, not well differentiated from weakly depressed metazona. Legs long and slender. Elytra and wings normal, former without any ridge on costal margin. Abdomen long and slender, feebly expanded posteriorly, surface with micro-reticulations, strongly pubescent above, pubescence longer on sides, hind margin of each tergite with a row of small compressed tubercles (like milling on the edge of a coin) which extend on sides as well, laterally without any large teeth but on segments 4th and 5th a small tubercle, rather larger than usual row of compressed tubercles, reminiscent of a tooth, present. Penultimate sternite transverse, narrowed posteriorly with hind margin rounded. Ultimate tergite strongly transverse, surface with micro-reticulations, median longitudinal furrow deep and distinct. Pygidium vertical, narrowed apically with two minute points. Forceps long and slender, trigonal for a short distance at base above, internal margin concave in a little more than half of the length, afterwards straight, internally armed in basal half with sharp teeth, widely spaced, apices gently hooked which meet. Genitalia as seen in figs. 25-26.

<i>Measurements</i> :	(in mm)	Holotype
		♂
Length of body		16.2
Length of forceps		8.0

Distribution : Known from the type locality only.

Remarks : This species resembles strongly with *F. trispinosa* var. *minor* Burr, due to the presence of dense long and short pubescence on the body and lacking tooth on the sides of abdominal segments but differs by the shape of parameres which are rounded at apex.

In the latter apical portion of parameres are somewhat narrowed.

***Forcipula quadrispinosa* (Dohrn)**

(Figs. 27-30)

Labidura quadrispinosa Dohrn, 1863, *Stettin ent. Ztg.*, 24 : 311 (♂, Tranquabar, India and Ceylon—Location of type uncertain) ; Bormans, 1888, *Annali Mus. civ. Stor. nat. Giacomo Doria*, 18 : 343 ; Bormans, 1894, *Annali Mus. civ. Stor. nat. Giacomo Doria*, 2 (14) : 377.

Forcipula quadrispinosa : Bolivar, 1897, *Annl. Soc. ent. Fr.*, 66 : 283 ; Bormans and Krauss, 1900, *Das Tierreich*, Lief 11 : 30 ; Burr, 1902, *J. Bombay nat. Hist. Soc.*, 14 : 323 ; Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 239 ; Burr, 1905, *J. Asiat. Soc. Beng. (N. S.)*, 1 : 27 ; Burr, 1907, *Bull. Mus. Hist. nat. Paris*, 1907 : 510 ; Burr, 1910, *Fauna Brit. India, Dermaptera* : 94, pl. 3, fig. 28 ; Burr, 1910, *Trans. It. ent.*

Soc. Lond., 1910 : 187 ; Burr, 1911, *Genera Insect.*, 122 : 38 ; Burr, 1912, *Annl. naturh. Mus. Wien.*, : 79 ; ? Burr, 1917, *Annl. Soc. ent. Fr.*, 86 : 59 ; Borelli, 1926, *Treubia*, 8 : 257 ; Borelli, 1931, *Rev. suisse Zool.*, 38 : 302 ; Hincks, 1947, *Ann. Mag. nat. Hist.*, (11) 14 : 527, fig. 4 ; Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 266 ; Brindle, 1968, *Acta Mus. Moraviae*, 53 : 292 ; Brindle, 1971, *Ent. Scand., Suppl.*, 1 : 224 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 21 ; Srivastava, 1970, *Eos Madr.*, 45 : 330 ; Srivastava, 1976, *Rec. zool. Surv. India Occ. pap.*, 2 : 43.

Labidura morosa Kirby, 1891, *J. Linn. Soc.*, 23 : 513 (♀, Loc. ?)—Type in British Museum (Natural History), London) ; Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 266.

Forcipula jacobsoni Burr, 1908, *Ann. Mag. nat. Hist.*, (8) 1 : 47 ; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 : 87, Burr, 1911, *Genera Insect.*, 122 : 33 ; Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 266.

Forcipula simplex Bey-Bienko, 1970, *Zool. Zh.*, 49 : 1815 (♂ ; North India ; type at Zoologische Staatssammlung, Munchen, FRG)—Syn. n.

Genitalata mahajani Kapoor, 1974, *Zool. J. Linn. Soc.*, 155 : 83, figs. 1-4 (♂ ; India : Himachal Pradesh—Types probably with author ; not deposited in Zoological Survey of India Calcutta except paratype 1 nymph (not ♂) Syn. n.

Material examined : INDIA : ASSAM : Goalpara dist., Raimona, 1 ♂, 8.v.1957 (*B. K. Tikader*) ; MADRAS : Coimbatore Dist., Annamalai Hills, Cinchona, 726 m, 4 ♂ ♂, 3 ♀ ♀, 20 nymphs (at various instars), —.v. 1968 (*P. S. Nathan*) ; UTTAR PRADESH : Dehra Dun dist., Rishikesh, 367 m, 1 ♂, 27.iii.1958, (*B. S. Lamba*) ; BIHAR : Hazaribagh Dist., Damodar River, near Ramgarh, 1 ♂, 27.x.1928 (*M. Sharif*).

Brief description : ♂ : General colour dark blackish brown, antennae, legs and sides of pronotum blackish brown ; finely pubescent.

Head slightly longer than broad, sutures faint ; eyes one third as long as the genae ; antennae 35-segmented. Pronotum quadrate, anterior margin straight, sides gently convex, hind margin rounded, median sulcus faint ; prozona tumid and metazona flat. Elytra well developed, rugose, humeral angles prominent ; wings as long as pronotum, of same texture as the elytra. Abdomen gently dilated posteriorly, sides of segments 3rd to 5th with a sharp spine, of which anterior and posterior pair reduced ; penultimate sternite rounded posteriorly. Ultimate tergite, forceps and parameres as seen in figs. 27-30.

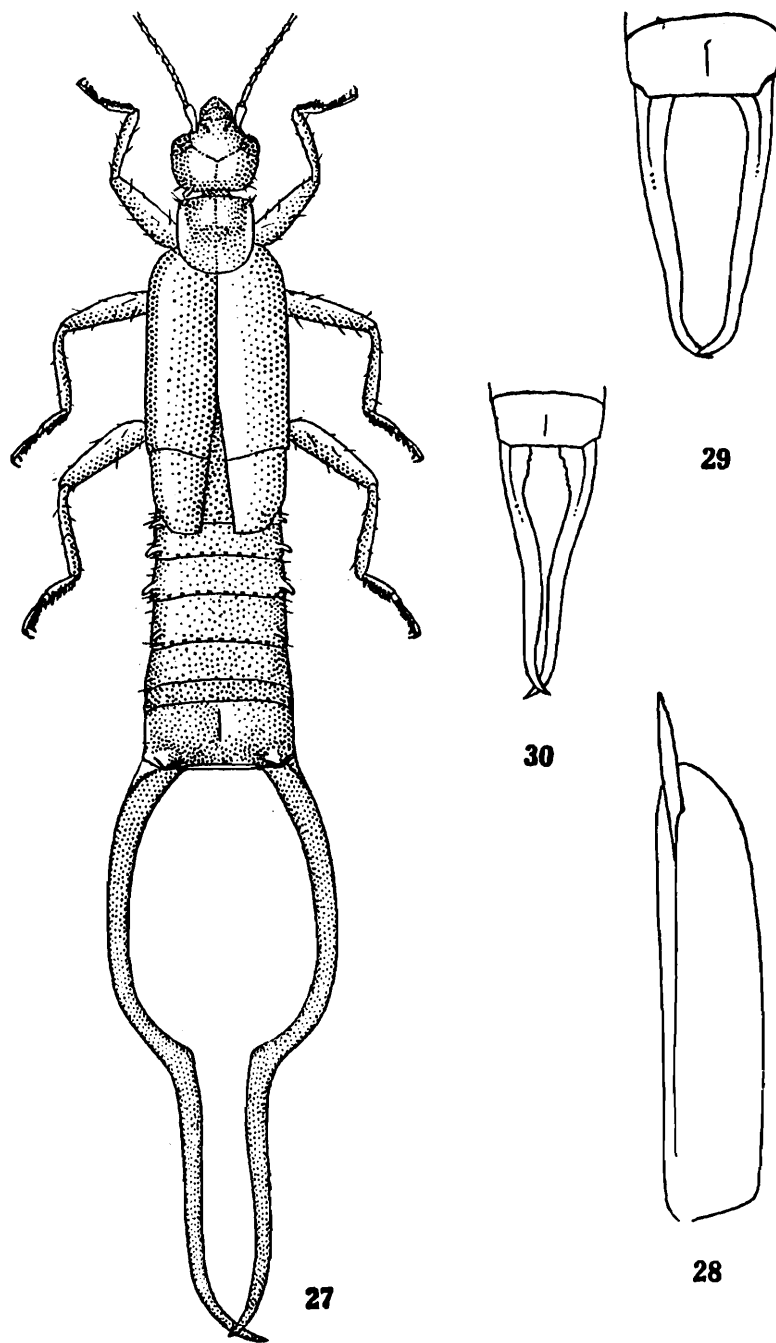
♀ : Agrees with male but sides of segments without spines ; ultimate tergite narrowed posteriorly ; forceps simple and straight.

Measurements : (in mm)

	♂ ♂	♀ ♀
Length of body	18-24	18.5-23.6
Length of forceps	7.5-17.5	6-8

Distribution : India, Bhutan, Nepal, Burma, Ceylon, Thailand, Indo-China, Java, Philippine Islands, also Reunion and Mauritius.

Remarks : Specimens with sides of abdominal segments completely lacking tubercles and weaker form of forceps are occasionally found in a large population.



Figs. 27-30 : *Forcipula quadrispinosa* (Dohrn), ♂, 27. Dorsal view ; 28. Paramere enlarged ; 29 and 30. Forceps with minor development.

Forcipula simplex Bey-Bienko (1970) is considered here as synonym since it represents the form with minor development of forceps and agrees with this species in almost all other characters.

Genitalata mahajani Kapoor (1974) is based on nymphs only. One Paratype labelled as Rajgarh Road, Gaura, coll. H. P. Agrawal, 5.viii.

1971 was examined which possesses somewhat rugose metanotal pads with a lateral rugose stripe. In all probabilities it represents nymphal stage of this species and is treated here as a synonym.

***Forcipula lurida* Bolivar**

(Figs. 31-32)

Forcipula quadrispiuosa var. *lurida* Bolivar, 1897, *Annls. Soc. ent. Fr.*, 66 : 283 (♂ ; Madras Presidency (India)—Type at Museum National d'Historie Naturelle, Paris) ; Bormans and Krauss, 1900, *Das Tierreich*, Lief 11 : 31.

Forcipula lurida : Kirby, 1904, *Syn. cat. Orthoptera*, 1 : 9 ; Burr, 1910, *Fauna Brit. India, Dermaptera* : 94, pl. 4, figs. 29, 29a ; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 ; 168 ; Burr, 1911, *Genera Insect.*, 122 : 38 ; Hebard, 1923, *Mem. Dep. Agric. India ent. Ser.*, 7 : 212 ; Brindle, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 266 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. pap.*, 2 : 48 ; Steinmann, 1980, *Acta. zool. Acad. Sci. Hung.*, 26 (1-3) : 237.

Material examined : INDIA : U. P. : Rishikesh, Lachman Jhula, Garur Chatti, near stream, 1 ♂ (genitalia mounted between two coverslips and pinned with the specimen), 30.v.1962 (A. Chandra coll.) ; Forest Research Institute, Dehra Dun (U. P.)

Brief description : ♂ : General colour yellowish brown, legs yellow, abdomen laterally and forceps along the internal margin reddish brown. Head triangular, longer than broad, sutures distinct, frons and occiput raised, hind margin slightly emarginate in middle. Antennae 30-segmented or more, 1st stout, shorter than the distance between the bases of antennae, remaining typical for the genus. Eyes prominent, but shorter than post-ocular length. Pronotum longer than broad, sides slightly emarginate in middle, median suture distinct. Elytra and wings well developed, rugose, former tuberculated and with faintly raised costal margin. Legs normal. Abdomen convex, punctulate, sides of abdominal segments 3rd to 5th with an oblique triangular tooth. Penultimate sternite triangular, rounded posteriorly with slight emargination in middle. Ultimate tergite transverse, faintly depressed in middle posteriorly, hind margin straight in middle and laterally above the bases of forceps concave and oblique. Forceps elongated, incurved in a little beyond basal half, afterwards contiguous and straight, tapering apically with tip pointed and hooked, internal margin ventrally in incurved part dentate and provided with a strong, posteriorly directed spine at the junction of basal incurved and apical straight part. Genitalia as seen in fig. 32.

♀ : Not known.

Measurements : (in mm)

Length of body

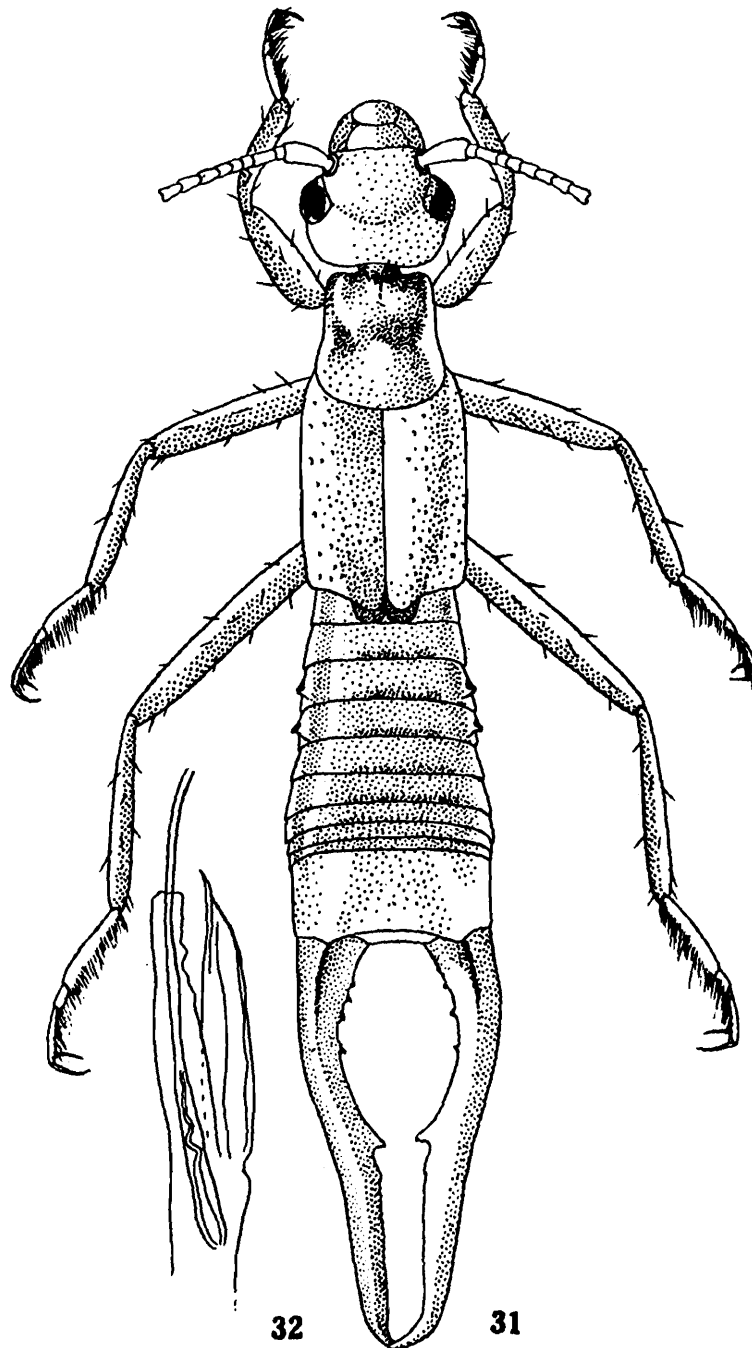
♂

23

Length of forceps

22

Distribution : India (Tamil Nadu and U. P.)



Figs. 31-32 : *Forcipula lurida* (Bolivar), ♂, 31. Dorsal view ; 32. Paramere with distal lobe of right side only.

Remarks : The present observations are based on a ♂ from North India (Rishikesh) whereas the species was originally described from South India.

It appears to be almost identical with *F. tuberculata* Srivastava, but the latter differs in having a pair of spines internally at the junction

of basal remote and apical subcontiguous part of forceps. Should there be any variation in this character, the latter will be placed as synonym.

For the present *F. tuberculata* is treated as valid since the inner armature in normal males is generally considered as constant. Besides, in the absence any material of *F. lurida* from South India it would not be prudent to take any decision.

***Forcipula tuberculata* Srivastava**

(Figs. 33-36)

Forcipula tuberculata Srivastava, 1977, *Dt. ent. Z.*, 24 : 289 (♂ : India : Arunachal Pradesh, Siang Dist., Kambang 200 m—Holotype in the Zoological Survey of India, Calcutta).

Material examined : INDIA : ARUNACHAL PRADESH : Siang Dist., Kambang, 200 m, Holotype ♂, 16.x.1966, at light (*S. K. Tandon & G. S. Arora*).

Description : ♂ : General colour shining yellowish brown, head, antennae and pronotum darker ; legs light yellow.

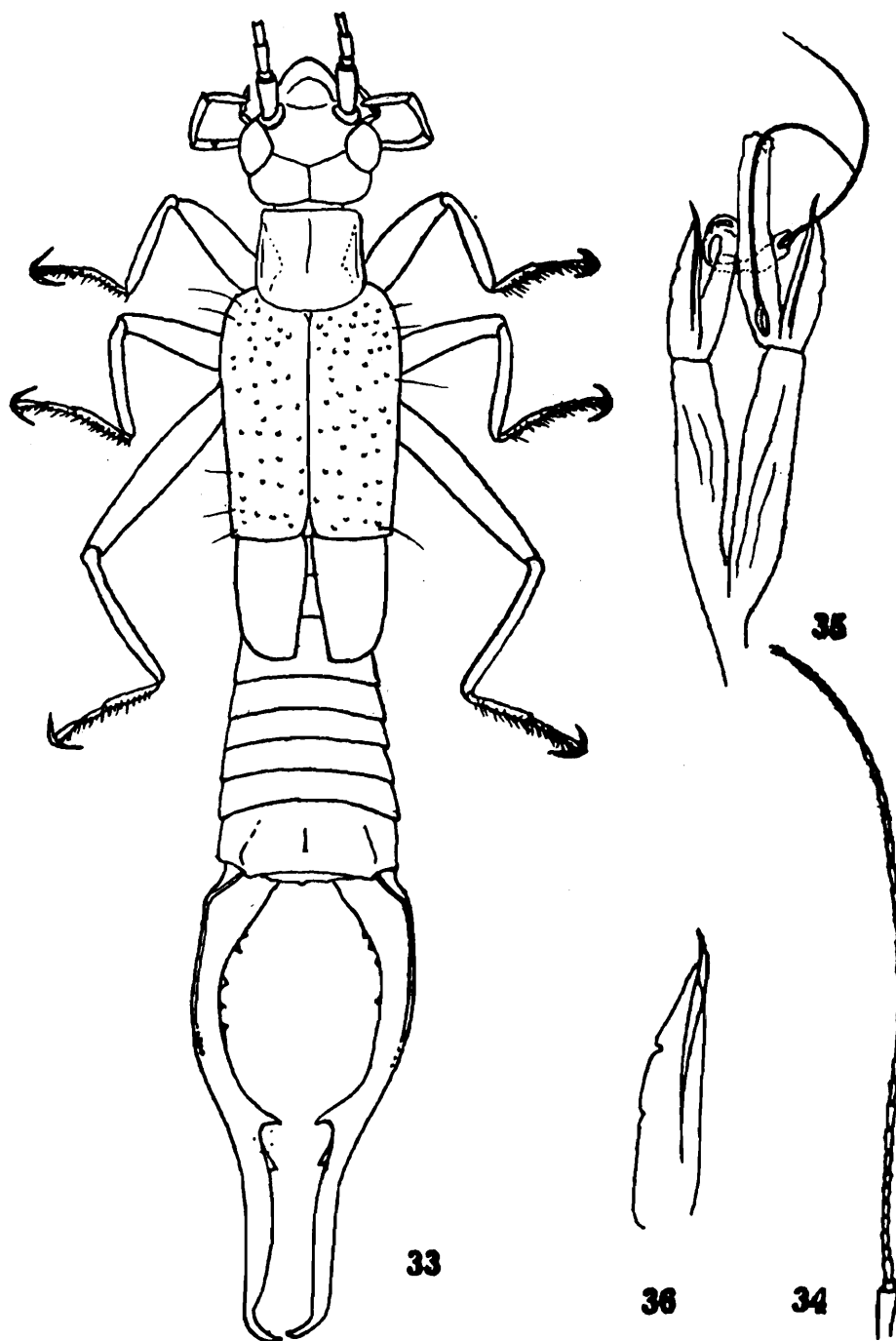
Head slightly longer than broad, finely pubescent, sutures distinct, frons and occiput weakly convex, gently depressed in middle at the junction of median and transverse sutures. Eyes large, prominent, about twice as long as the genae. Antennae 35—segmented ; 2nd small, equal to 4th ; 3rd long, cylindrical, equal to 4th and 5th together, rest long and thin, gradually increasing in length. Pronotum longer than broad, lateral margins gently emarginate in middle, hind margin broadly rounded, median sulcus distinct ; prozona tumid, well differentiated from flat metazona. Elytra twice as long as pronotum, translucent, tuberculated, hind margin truncate. Wings slightly longer than the pronotum, opaque, of same texture as elytra. Abdomen finely punctulate, gently expanded posteriorly, sides of segments 3rd to 5th with an oblique, triangular, serrated ridge. Penultimate sternite ample, triangular, posteriorly obtuse with a slight emargination in middle. Forceps remote, with an oblique ridge above at base, curved up to a little beyond middle, thence almost straight, subcontiguous tapering with apices hooked and pointed, internally dentate below in basal one third, provided with a sharp tooth at the point of bend followed by another similar one but slightly smaller. Genitalia as seen in fig. 35 and 36.

♀ : Agrees with male in most character except penultimate sternite and ultimate tergite more narrowed posteriorly and forceps simple and straight, internally crenulate with a distinct preapical tooth.

Measurements : (in mm)

	Holotype
	♂
Length of body	15.4
Length of forceps	9.0

Distribution : India (Assam and Arunachal Pradesh).



Figs. 33-36 : *Forcipula tuberculata* Srivastava, Holotype ♂, 33. Dorsal view ;
34. Antennae ; 35. Genitalia, 36. Paramere enlarged.

Remarks : This species has a close resemblance with *F. lurida* Bolivar, known from Madras and U.P., in general body colour and the shape of lateral abdominal spines but it can be easily separated by the presence

of large eyes, about twice as long as genae; translucent and tuberculated elytra and forceps with a pair of sharp spines internally, of which the posterior one is smaller and situated a little beyond middle.

The parameres of the type have deep constrictions on external margin which appear to be due to shrinkage during mounting since other specimen has the external margin entire. The tuberculated elytra in this species recalls *F. banksi* Borelli, described from Philippines.

It may be mentioned here that Brindle (1966) has placed *F. lurida* Boliver in *quadriscopiosa* group because of the rugose elytra.

UNCERTAIN POSITION

Forcipula leonardi Steinmann

Forcipula leonardi Steinmann, 1981. *Atti Soc. ital. nat. Museo civ. Stor. nat. Milano*, 122 (3-4): 160 (♀; India: Andaman Is., Port Blair—Type at Museo Civico di Storia Naturale, Milano, Italy).

Brief description: ♀: General colour reddish brown, head red, antennae dark brown, pronotum black and yellow laterally, tegmina and abdomen reddish brown, former along the inner margin with light reddish stripe, wings yellow with tip light brown, legs dark brown.

Head broader than pronotum, sutures distinct. Antennae 27-segmented, 1st longer than the distance between antennal bases; 2nd short; 3rd twice as long as 4th. Pronotum almost square, sides parallel, hind margin rounded. Elytra and wings well developed, rugose. Legs normal. Abdomen elongated, punctate. Ultimate tergite transverse, narrowed posteriorly. Forceps almost straight, tapering with apices gently hooked, at base above trigonal, inner margin dentate in basal 3/4 only.

Measurements: (in mm)

	Holotype
	♀
Length of body (including forceps)	27

Distribution: Known from the type locality only.

Remarks: Since this species is described on a ♀, its taxonomic status remains doubtful. It comes close to *F. quadriscopiosa* but differs by the colouration of elytra and wings and forceps lacking preapical internal tooth in females.

SUMMARY

Present study deals with Indian Labidurinae which comprise two genera and 14 species. The genus *Labidura* Leach, contains two species viz., *L. riparia* (Pallas) and *L. dharchulensis* Gangola. Former is world wide in distribution and shows tremendous variations. Under this species four species namely, *Diplatys himalayanus* Baijal and Singh, *Spongiphora nainitalensis* Baijal and Singh ; *Erotesis jeolikotensis* Baijal and Singh and *Elaunon nainitalensis* Baijal and Singh are synonymised after examination of their types.

The genus *Forcipula* Boliver, includes 10 species, of which two are new to science. It is proposed to place genus *Genitalata* Kapoor, as synonym of this genus. *F. clavata* Liu, which was considered earlier as synonym of *F. decolyi* Bormans, is resurrected. In addition following synonymies are proposed : *Forcipula obscura* Steinmann under *F. clavata* Liu, *F. afghana* Steinmann under *F. trispinosa* (Dohrn) and *Forcipula simplex* Bey-Bienko and *Genitalata mahajani* Kapoor under *F. quadrispinosa* (Dohrn).

The male genitalia of *Forcipula despinosa* Hebard and *F. borellii* Chopard are described and figured for the first time from their types.

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