

NOTES ON ISOLABOIDINAE (INSECTA : DERMAPTERA : ANISOLABIDIDAE)
FROM THE INDIAN SUBCONTINENT

G. K. SRIVASTAVA

Zoological Survey of India, Calcutta

INTRODUCTION

Isolaboidinae was erected by Brindle (1978) with *Isolaboides* Hincks (1958) as its type-genus, Hincks (1. C) described this genus for the reception of *Pseudisolabis kosswigi* Burr, 1947 as its type and included two other species viz. *Isolaboides tuberculata* sp. n. and *Pseudisolabis burri* Borelli, 1909. He also hinted that perhaps *Pseudisolabis immsi* Burr, 1913 and *P. renschi* Günther, 1932 may belong to this genus.

Taxonomic position of various species from Indian subcontinent included here is discussed. Following is the list of species recorded or described from the area, is arranged chronologically :

- (i) *Pseudisolabis burri* Borelli, 1909
- (ii) *Pseudisolabis tenera* Burr, 1910
- (iii) *Pseudisolabis immsi* Burr, 1913
- (iv) *Pseudisolabis elegans* Hebard, 1917
- (v) *Pseudisolabis jonathani* Kapoor and Katiyar, 1971
- (vi) *Pseudisolabis santokhi* Kapoor and Katiyar, 1971

All the species are congeneric according to original placement, although referred to different genera by subsequent workers. Male genitalia of all the species is known except for *P. tenera* Burr, 1910 and *P. elegans* Hebard, 1917 and are treated here as uncertain species.

While studying the material of those species known by their male genitalia two different forms, on the basis of external morphology in general and male genital in particular, could be noted.

In one case the male forceps (f. macrolabia) are stout and abruptly curved in posterior half or (in microlabia) straight and gently hooked apically and genitalia with

parameres somewhat broader, anterior margin ablique forming an obtuse angle with external margin and virga spirally coiled but coils short and narrow.

The *P. burri* Borelli, 1909 confirms the above diagnosis. It is further corroborated by the figure of genitalia of the type of this species given by Sakai (1987, p. 2319) and labelled as "BMNH ; Drawer 10 Type SS 65-1050".

In the other form, the forceps (f. *macrolabia*) are comparatively thin or less stout, regularly incurved or (in *microlabia*) straight in basal two thirds, afterwards strongly or gently incurved with apices acuminate and hooked. Moreover, the parameres are broader at base, gradually narrowing towards apex, tip acute and the coils of virga are large and loosely arranged. Under this group *P. immsi* Burr, 1913 should be included with *Pseudisolabis jonathani* Kapoor and Katiyar and *Pseudisolabis santokhi* Kapoor and Katiyar as its synonym.

As a result of present study based on a large series of specimens, it is now known that *P. immsi* possesses both microlabic (straight for the most part and hooked apically), and macrolabic (strongly incurved) form of forceps. In view of this it not possible to place accurately *P. tenera* and *P. elegans* since both are known by microlabic form of forceps only and they may belong to either of two groups of species when their genitalia are described. Should *P. tenera* proves to be conspecific with *P. immsi*, the latter will have the priority.

Isolaboides rimosus Steinmann, is quite distinct from other species by its shape of male penultimate sternite and genitalia, the latter appears to represent, immature stage. It is treated here as valid but examination of genitalia and penultimate sternite is desirable.

Steinmann (1990) erected *Paralaboides* with *Pseudisolabis jonathani* Kapoor and Katiyar, 1971 as the type and *Pseudisolabis santokhi* Kapoor and Katiyar, 1971, both from India. These species are treated as synonym of *Pseudisolabis immsi* Burr, 1913 as indicated above. Accordingly *Paralaboides* should be placed as synonym of *Isolaboides*.

The male genitalia of various species included here have right distal lobe (Penis lobe) atrophied with rudimentary virga as stated by different workers but it is difficult to discern in the series of genitalic preparations examined by me. Left distal lobe is enormously developed or when fully flexed forward, covers, in part, the proparameres and parameres, giving false impression of a preputial sac, especially in mounted condition.

Perhaps this has led Steinmann to believe that proparamere is unpaired and describe a new genus *Paralaboides*.

A careful examination of male genitalia, before mounting, reveals that proparamere is paired and left distal lobe is greatly enlarged with virga spirally coiled. In the light of this it would be justified to place Isolaboidinae under Anisolabididae rather than under Labiidae as has been done by Steinmann (l. c.).

ANISOLABIDIDAE

ISOLABOIDINAE

Isolaboides Hincks

1958. *Isolaboides* Hinks, *EOS*, Madrid, 34 : 131 (Type-species : *Pseudisolabis kosswigi* Hincks, 1947).
 1990. *Paralaboides* Steinmann, *Das Tierreich*, 106 (Part) : 10 (Type-species : *Pseudisolabis jonathani* Kapoor and Katlyar, 1971), Syn. n.

Diagnostic characters ; Eyes small, shorter than post ocular length. Antennae 18-22 jointed, 1st shorter than the distance between antennal bases. Apterous. Meso- and metanotum ecarinate laterally. Legs with femora thick, hind tarsi with 1st segment almost equal to combined length of 2nd & 3rd ; 2nd distinctly longer than broad, narrow and slightly shorter than 3rd. Pygidium vertical. Genitalia with proparameres paired but genital lobe of right side atrophied and of left side well developed with virga spirally coiled.

Type species : *Pseudisolabis kosswigi* Hincks, 1947.

Distribution : From Asia Minor to India.

Key to the species (based on males)

- 1 (4). Penultimate sternite with hind margin entire ; virga large and spirally coiled
- 2 (3). Forceps (in forma macrolabia) stout and abruptly curved in apical half ; Parameres broad, anterior margin oblique, forming an obtuse angle with external margin, coils of virga short and narrow...*I. burri* (Borelli)
- 3 (2). Forceps (in forma macrolabia) comparatively thinner, regularly incurved ; Parameres narrower, broadest at base, gradually narrowing towards apex, coils of virga large and loosely arranged...*I. immsi* (Burr)
- 4 (1). Penultimate sternite posterolaterally with a concavity, virga short and coiled ...*I. rimosus* Steinmann

Isolaboides burri (Borelli)

Figs. 1-6

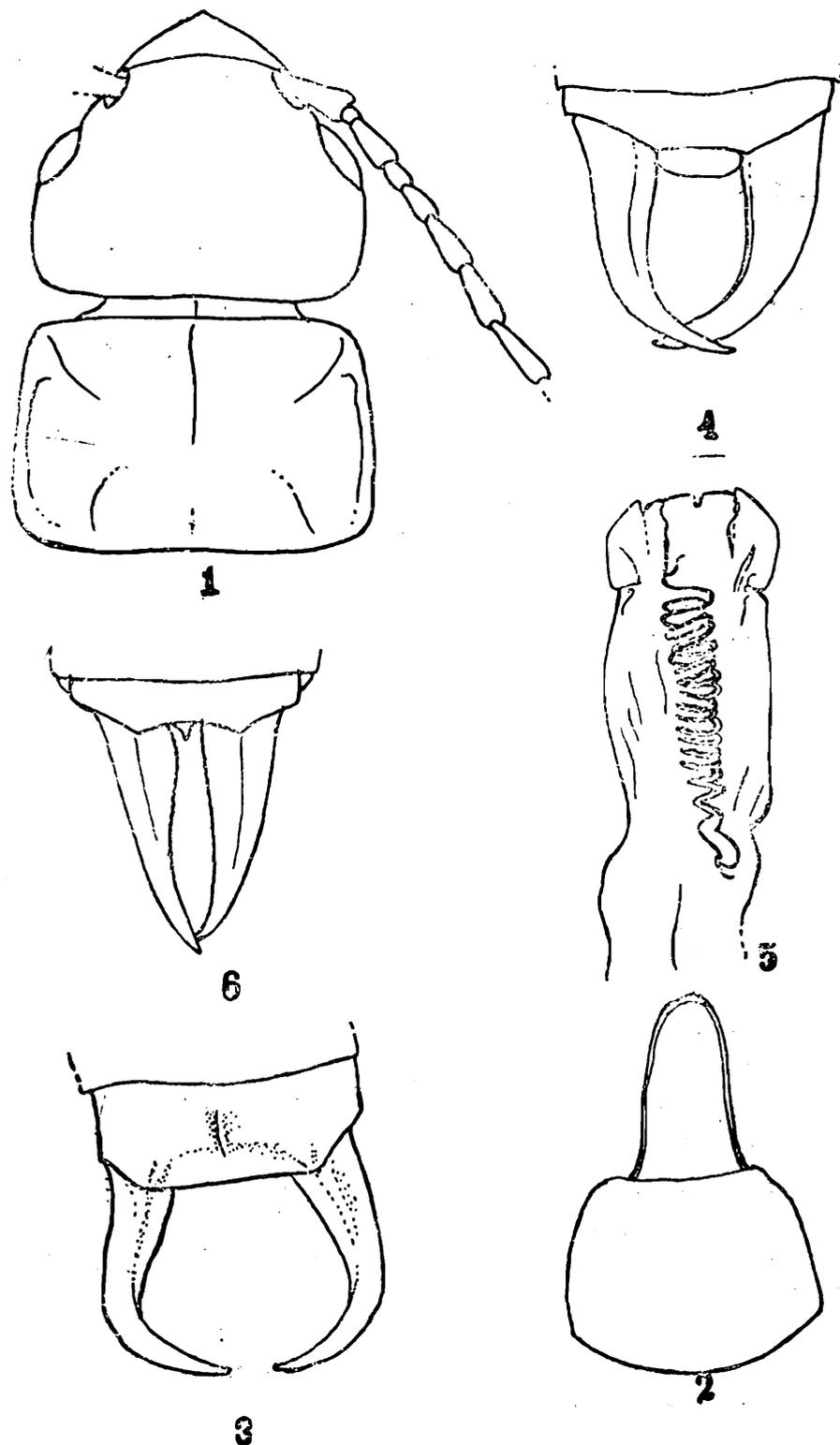
1909. *Pseudisolabis burri* Borelli, *Boll. Musei. zool. Anat. comp. R. Univ. Torino.* 24, No. 603 : 1 (4 male, 3 female ; NE Kashmir—along the road from Gilgit to Srinagar, 2500 m).
1910. *Pseudisolabis burri* ; Burr, *Fauna of British India, Dermaptera* : 103.
1911. *Pseudisolabis burri* ; Burr, *Genera Ins.*, 122 : 39, 3, fig. 14 (Head and sternum).
1935. *Pseudisolabis burri* ; Bey-Blenko, *Wiss. Ergebn. Niederl. Exped. Karakorum, zool.* ; 209 (2 Male, 2 Female ; Kashmir, Sonamarg on the river Sind ; 5 Male, 2 Female ; valley of the river Sind, 2000-2800 m).
1958. *Isolaboides burri* ; Hinks, *EOS, Madrid*, 34 : 132.
1978. *Isolaboides burri* ; Brindle, *Senckenbergiana biol.*, 58 :

Description : Male : General colour brownish black or black ; head and pronotum shining ; meso- and metanotum and abdomen dull with short and fine pubescence ; legs with femora and tibia black and joints yellow and tarsi slightly lighter in colour.

Head smooth, slightly longer than broad, frons convex, sutures obsolete. Eyes shorter than post-ocular length. Antennae 13-segmented or more, 1st stout, shorter than the distance between antennal bases; 2nd short ; 3rd long and cylindrical ; 4th short, globular ; 5th subconical, slightly longer than preceding ; 6th stout but equal to 3rd, remaining subconical and gradually increasing in length. Pronotum smooth, transverse, all margins straight, gently widened posteriorly, prozona and metazona little differentiated, median sulcus faint.

Meso and metanotum strongly transverse, former with hind margin straight and in latter emarginate. Apterous. Legs short, femora thickened, tarsi with 1st segment about as long as the combined length of 2nd and 3rd ; 2nd narrow but longer than broad.

Abdomen weakly convex, gently dilated in posterior two thirds, sides of segments 5 to 9 obtuse angulate posteriorly. Penultimate sternite transverse, hind margin in middle convex, manubrium about as long as the sternite and of uniform width throughout. Pygidium vertical, not visible from above, triangular, base almost filling the space between the branches of forceps. Ultimate tergite weakly transverse, gently narrowed posteriorly, hind margin laterally, above the bases of forceps oblique and in middle straight, sloping backwards, faintly depressed in middle posteriorly. Forceps stout, remote at base, branches straight and diverging up to a little beyond middle afterwards abruptly and strongly bowed (*f. macrolabia*) or almost straight and gently incurved a little before apex (*f. microlabia*) with apices gently hooked, branches trigonal in basal one third. Genitalia with parameres longer than broad, narrowed apically, externally



Figs. 1-6 : *Isolaboides burri* (Borelli), Male, 1. Head, pronotum, and a few basal antennal segments of right side; 2. Penultimate sternite with manubrium; 3. Ultimate tergite and forceps (f. macrolabia); 4. Ultimate tergite and forceps (f. microlabia); 5. Genitalia, Female, 6. Ultimate tergite and forceps.

above forming an angle a little before apex, virga of left side spirally coiled but coils narrow and compact.

Female: Agrees with males in most characters except that ultimate tergite narrowed posteriorly and forceps simple and straight.

Measurements : (in mm)

	Male	Female
Length of body :	8.0-9.1	8.0-9.1
Length of forceps :	1.9-2.0	2.0-2.1

Distribution : In the mountains of India (Kashmir) and Pakistan.

Remarks : This species can be easily determined by its strongly transverse pronotum : stout forceps, abruptly curved in apical two thirds or gently incurved a little before apex and genitalia with parameres near apex externally angular and virga of left side with narrow loops and arranged in a compact linear fashion.

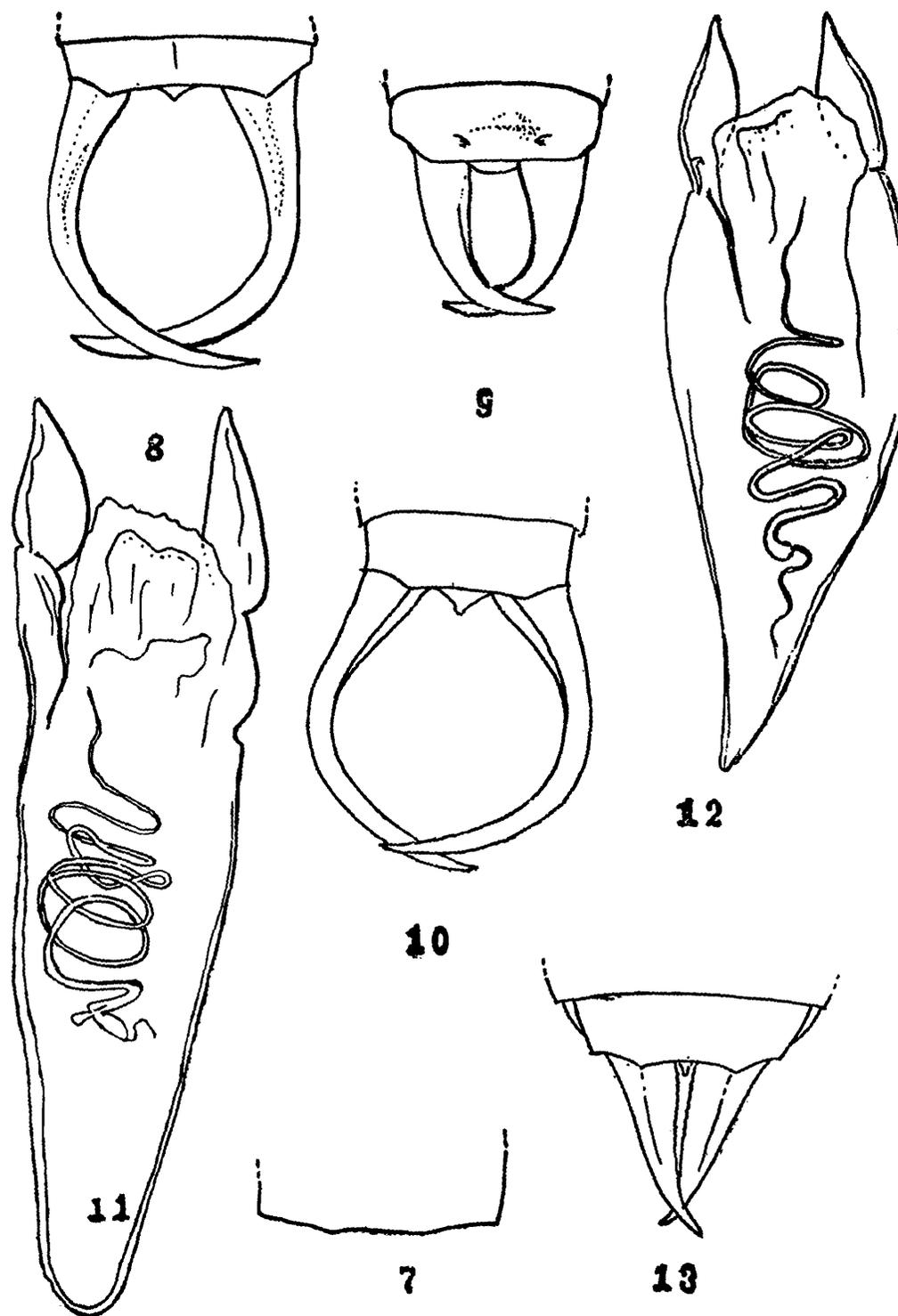
Isolaboides immsi (Burr)

Figs. 7-14

1913. *Pseudisolabis immsi* Burr, *J. Asiat. Soc. Beng. (N. S.)*, 9 : 184 (Northern India : Base of Himalayas at Kurdi in Jaunsar).
1914. *Pseudisolabis burri* (nec Borelli) : Burr, *Rec. Indian Mus.*, 10(5) : 290 (Female ; Simla Hills, Matiana, 8000 ft.).
1966. *Parisolabis immsi* ; Popham and Brindle, *Entomologist*, 99 : 133.
1971. *Pseudisolabis jonathani* Kapoor and Katiyar. *J. nat. Hist.*, 5 : 499, figs. 1 and 2 (Male ; Simla Hills, Baghi, Himachal Pradesh—deposited in the Division of Entomology Indian Agricultural Research Institute, New Delhi)—Syn. n.
1971. *Pseudisolabis santokhi* Kapoor and Katiyar, *J. nat. Hist.*, 5 : 500, figs. 3 and 4 (Male ; Under stones, Manali, 1930 m, Himachal Pradesh—deposited in the Division of Entomology, Indian Agricultural Research Institute, New Delhi)—Syn. n.
1990. *Paralaboides jonathani* ; Steinmann, *Das Tierreich*, 106 : 11
1990. *Paralaboides santokhi* ; Steinmann, *Das Tierreich*, 106 : 12.
1993. *Isolaboides burri* (nec Borelli) ; Srivastava and Lal, *Rec. zool. Surv. India*, 91 (1) : 116, figs. 11 & 12 (Himachal Pradesh).

Description : Male : General colour brownish black, sides of pronotum, tarsi and antennae somewhat lighter in colour.

Head slightly longer than broad, smooth, frons weakly convex, sutures obsolete hind margin emarginate in middle. Eyes generally black, sometimes whitish, about half as long or slightly less than post-ocular area. Antennae 15-segmented, 1st stout, shorter



Figs. 7-13 : *Isolaboides immsi* (Burr), Male, 7. Posterior margin of penultimate sternite ; 8. Ultimate tergite and forceps (f. *macrolabia*) ; 9. Ultimate tergite and forceps (f. *microlabia*) ; 10. Ultimate tergite and forceps (f. *macrolabia*) ; 11 and 12. Genitalia, Female ; 13. Ultimate tergite and forceps.

(Figs. 8 and 11 from the same specimen ; figs. 9 and 12 from the same specimen and fig. 10 from the Holotype, Male of *Pseudisolabis santokhi* Kapoor and Katiyar).

than the distance between antennal bases ; 2nd short ; 3rd long and cylindrical, gently expanded apically, slightly longer than 4th, remaining slightly increasing in length, one or two apical segments thin and rod shaped. Pronotum slightly wider than long, apical and lateral margin straight, gently widen posteriorly, hind angles rounded and margin almost straight or showing a trace of emargination in middle, smooth, impunctate, prozona weakly raised and scarcely differentiated from depressed metazona, median sulcus faintly marked on prozona. Meso and metanotum transverse, obscurely reticulated, former with hind margin straight and latter broadly emarginate. Legs long and slender, hind tarsi with 1st segment about as long as the combined length of 2nd and 3rd, 2nd slightly longer than broad ; 3rd about twice as long as 2nd ; claw without an arolium. Abdomen spindle shaped, covered with very fine and short pubescence above, on sides a few long and short hairs present, sides of segments broadly convex. Penultimate sternite transverse, slightly depressed posteriorly, hind margin subtruncate. Ultimate tergite transverse, smooth, sloping backwards with a roughly triangular depression in middle posteriorly, sides straight, hind margin in middle between the branches of forceps straight, oblique above the base of forceps, gently narrowed posteriorly in micro-labic form. Pygidium vertical, triangular. Forceps with branches remote at base in macrolabic form, strongly arcuate, internally differentiated into dorsal and ventral borders up to middle, afterwards branches circular in cross section, apices pointed and hooked ; in forma microlabia comparatively less stout, straight in basal half ; afterwards gently incurved. Genitalia with parameres broader at base, gradually narrowing apically to pointed apex, external and internal margin convex, distal lobe of left side enormously developed with spirally coiled virga, coils of virga loose and broad, distal lobe of right side atrophied.

Female : Agrees with males in most characters except penultimate sternite obtuse posteriorly ; ultimate tergite narrowed posteriorly ; pygidium vertical, narrow, posteriorly pointed and straight.

Measurements : (in mm)

	Male	Female
Length of body :	6.4-12.0	8.6-8.8
Length of forceps :	1.2-3.0	1.1-1.3

Distribution : Himachal Pradesh (Lahaul and Spiti, Chamba, Kinnaur and Kangra districts).

Remarks : This species can be separated in macrolabic form by its strongly curved and thin forceps and genitalia with parameres narrowed apically, tip pointed and external and internal margin convex and spirally coiled virga with broad and loose coils.

Isolaboides rimosus Steinmann

Figs. 16—18

1983. *Isolaboides rimosus* Steinmann, *Revue Suisse Zool.*, 90 (3) : 251, figs, 748 (Male ; India ; Garhwal, Dhanolti).

Description : Male : General colour dark reddish brown, legs lighter in colour. Head smooth, frons convex, sutures distinct. Eyes small, shorter than post-ocular length. Antennae 17-segmented, 1st stout, shorter than the distance between antennal bases : 2nd short, quadrate ; 3rd long and cylindrical, longer than 4th and 5th. Pronotum weakly transverse, sides parallel, angles rounded, median sulcus distinct. Apterous. Abdomen spindle shaped, finely punctulated, tergites convex. Penultimate sternite postero-laterally with an excised concavity, median lobe broad. Ultimate tergite transverse, posterior margin in middle lightly concave, oblique laterally above the base of forceps. Pygidium vertical, trigonal. Forceps strongly in curved, trigonal in basal half, afterwards cylindrical, very similar to *I. burri*. Genitalia with parameres broad at base, narrowed apically, distal lobes indistinct, virga short & coiled.

Female : Unknown.

Measurements : (in mm)

Male

Length including forceps : 13.00

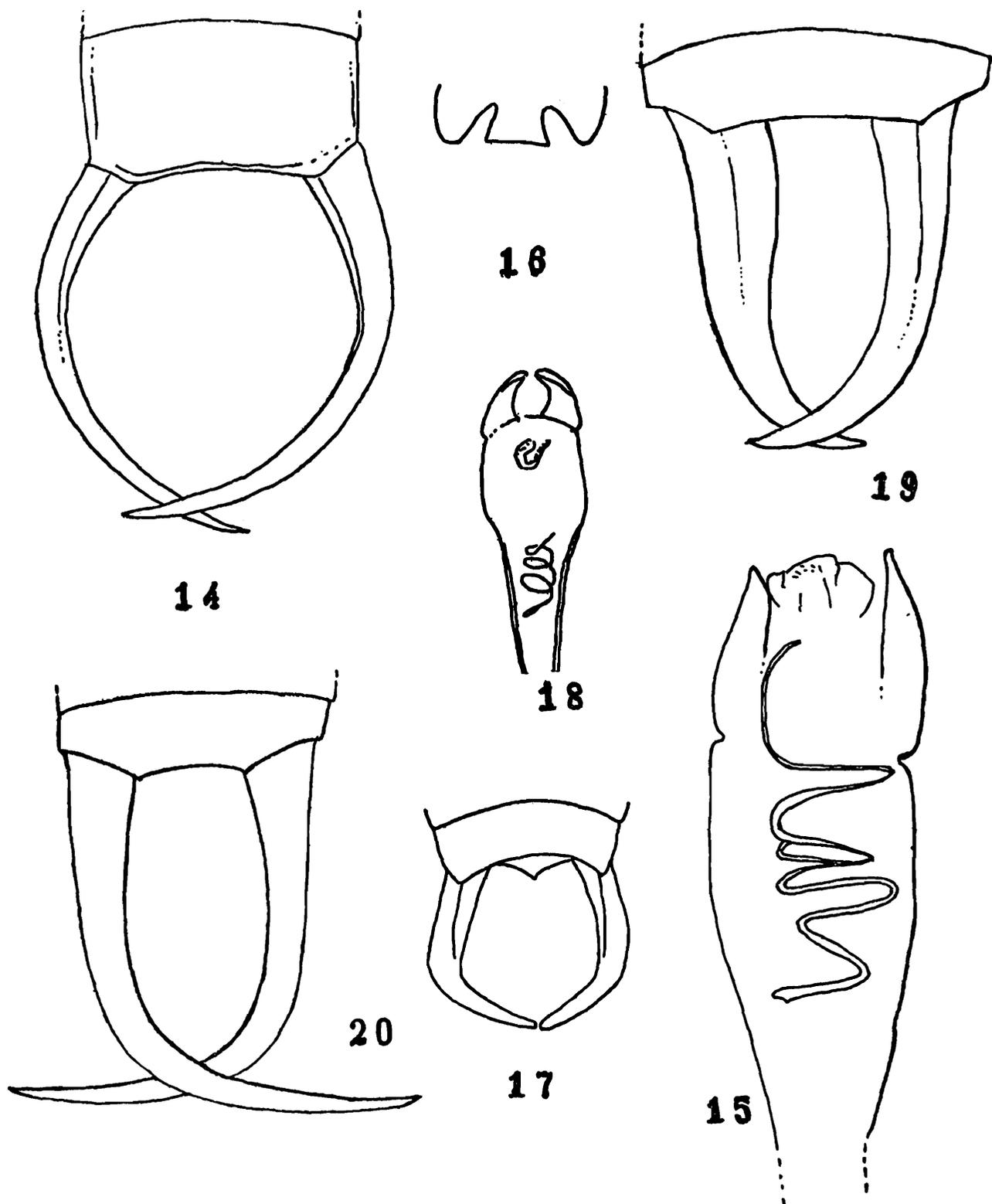
Distribution : India : U.P. (Garhwal Hills).

Remarks : This species differs from all the known species of the genus by its characteristic penultimate sternite.

The male genitalia appears to represent the immature stage.

The coloured photograph of the penultimate sternite given by Sakai (1987, p. 2278) suggests that posterior concavities may not be natural but might be due to damage caused during pulling it off the specimen with forceps for examination of genitalia.

In view of this, it seems necessary to examine the 'Type' for deciding the identity of the species.



Figs. 14-20 : *Isolaboides immsi* (Burr), Male, 14. Ultimate tergite and forceps ; 15. Genitalia ; *Isolaboides rimosus* Steinmann, Holotype, Male, 16. Hind portion of penultimate sternite ; 17. Ultimate tergite and forceps ; 18. Genitalia ; *Isolaboides tenera* (Burr), Male, 19. Ultimate tergite and forceps ; *Isolaboides elegans* (Hebard), Male, 20. Ultimate tergite and forceps. (Figs. 14 & 15 drawn from the Holotype Male of *Pseudisolabis jonathani* Kapoor and Katiyar, figs. 16-18 after Steinmann, 1983 ; fig. 19 after Burr, 1910 and fig. 20 after Hebard, 1917).

DOUBTFUL SPECIES

Isolaboides tenera (Burr)

Fig. 19

1910. *Pseudisolabis tenera* Burr, *Fauna British India, Dermaptera* : 104, fig. 36 (Male : Punjab : Murree).
 1911. *Pseudisolabis tenera* ; Burr, *Genera Ins.*, 122 : 39.
 1935. *Pseudisolabis burri* (nec Borelli) ; Bey-Bienko, *Wiss. Ergebn. Niederl. Exped. Karakorum, Zool.* : 209 (2 Male, 2 Female ; Kashmir : Sonamarg on river Sind ; 5 Male, 2 Females ; treated *Pseudisolabis tenera* Burr as synonym).

Brief description : Male : General colour dull brown with sparse pubescence.

Head slightly longer than broad, sutures obsolete. Eyes shorter than the post-ocular area. Antennae 17-segmented, 1st stout shorter than the distance between antennal bases ; 3rd long and cylindrical ; 4th short, remaining increasing in length distally. Pronotum rectangular, gently widened posteriorly, sides and hind margin straight. Legs long and slender, hind tarsi with first segment equal to 2nd and 3rd together. Abdomen moderately convex, finely punctulated, contracted posteriorly. Penultimate sternite transverse, hind margin broadly rounded. Pygidium vertical, narrowed posteriorly. Ultimate tergite strongly transverse. Forceps remote at base, almost straight in most part except apices gently incurved.

Female : Not known.

Measurements : (in mm)	Male
Length of body :	11.5
Length of forceps :	1.5

Distribution : Pakistan : Punjab, Murree.

Remarks : This species is so far known by its 'Holotype Male' but genitalia has not been described.

In the original description "...second tarsal segment nearly as long as the first" has been mentioned, which is incorrect. It should be 'first tarsal segment equal to 2nd and 3rd together'.

It is almost certain that this species should be included under *Isolaboides* on the basis of external morphology.

Isolaboides elegans (Hebard)**Fig. 20**

1917. *Pseudisolabis elegans* Hebard, *Proc. Acad. nat. Sci. Philad.*, 69 : 236, pl. 16, figs, 2-3 (Male, Female ; India : Kulu Kangra).
 1923. *Pseudisolabis elegans* ; Hebard, *Mem. Dep. Agric. India ent. Ser.*, 7 : 212.
 1966. *Parisolabis elegans* ; Popham and Brindle, *Entomologist*, 99 : 133.

Brief description : Male : General colour dull brown. Exceedingly finely pubescent.

Head with sutures marked by very feeble impressions. Eyes shorter than post-ocular area. Antennae with 1st segment stout, shorter than the distance between antennal bases. Pronotum rectangular, widened posteriorly, sides and hind margin straight. Legs long and slender, hind tarsi with first segment almost equal to second and third together ; second more than half as long as the third. Abdomen moderately convex, sides of abdominal segments broadly convex posteriorly. Penultimate sternite, transverse, hind margin rounded with slight emargination in middle. Ultimate tergite strongly transverse. Pygidium declivent ; subtrigonal with apex rounded. Forceps with branches remote at base, regularly and strongly incurved, tapering apically with tips strongly hooked, cylindrical but in middle inner surface flattened.

Female : Agrees with males in most characters except that penultimate sternite with hind margin comparatively not so broadly rounded and forceps simple and straight, trigonal above.

Measurements : (in mm)

	Male	Female
Length of body :	9·2-10·2	8·3-9·0
Length of forceps :	1·8-3·0	1·8-2·8

Distribution : India : Himachal Pradesh, Kulu Kangra.

Remarks : On the basis of external morphology it appears to be conspecific with *Isolaboides immsi* (Burr). However, its true identity can be established when the male genitalia is described.

ACKNOWLEDGEMENTS

I am thankful to the Director, Zoological Survey of India for providing necessary facilities during the course of this paper.

SUMMARY

Notes on species from Indian subcontinent are provided. Three valid species viz. *Isolaboides burri* (Borelli), *I. immsi* (Burr) and *I. rimosus* Steinmann are recognised and *I. tenera* (Burr) and *I. elegans* (Hebard) are considered as doubtful species since their male genitalia is not described. Besides, *Pseudisolabis jonathani* Kapoor and Katiyar and *Pseudisolahis santokhi* Kapoor and Katiyer are treated as synonym of *Isolaboides immsi* (Burr).

REFERENCES

- Brindle, A. 1978. Dermaptera from Kashmir and Ladakh (Insecta). *Senckenbergiana biol.*, 58 (3-4) : 203-209.
- Hincks, W.D. 1958. Some notes on Parisolabinae (Dermaptera). *EOS, Madrid*, 34 (2) : 131-134.
- Sakai, S. 1987. Dermapterorum Catalogus, XIX-XX : Iconographia IV-V., 21 : 1081-2647.
- Steinmann, H. 1990. Dermaptera, Eudermaptera I. *Das Tierreich*, 106 : I-XVIII+I-558 (Walter de Gruyter, Berlin and New York).