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Review of the genus *Ipidia* Erichson of India (Coleoptera: Nitidulidae: Nitidulinae)

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Abstract

Two species of *Ipidia* [*viz. Ipidia (Hemipidia) sjoebergi* Jelínek, 1978 and *Ipidia (Ipidia) variolosa* Reitter, 1879] have been worked out of a collection from India. The genus and the species are re-described. A key to the species of *Ipidia* from India is appended.

Keywords: *Coleoptera, Nitidulidae, Nitidulinae, Ipidia, Review, India.*

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Introduction

Ipidia Erichson is a comparatively small genus with two species [*viz, Ipidia (Hemipidia) sjoebergi* Jelínek, 1978 and *Ipidia (Ipidia) variolosa* Reitter, 1879] hitherto recorded from India. Erichson (1843) erected the genus *Ipidia* for the species *Ips quadrinotata* Fabricius, 1798 [=*Ipidia binotata* Reitter, 1875] based upon characters, such as: straight and parallel antennal groove; emarginated labrum;thickened labial palpi; bilobed apices of mandibles etc., and placed it under the subfamily 'Nitidulinae'. Redtenbacher (1845, 1858) keyed out the genus *Ipidia* from other genera of 'Nitidulae'. Erichson (1845), Redtenbacher (1849, 1874), Bach (1851), Gutfleisch and Bose (1859), Reitter (1873, 1911), Everts (1881, 1898) noted several other characteristic features of the genus *Ipidia*. Lacordaire (1854) and Jacquelin du Val (1858) re-described the genus *Ipidia*. Thomson (1859, 1862) pointed out certain characteristic features of the genus *Ipidia*. Thomson (1867) keyed out the genus '*Ipidia'* from other genera of subfamily Nitidulinae. Reitter (1884) dealt with the species of *Ipidia* from Japan. Marseul (1885) noted the diagnostic characters of *Ipidia* and re-described few species from the old world. Ganglbauer (1899) re-characterised *Ipidia* and several species under it from Middle Europe. Grouvelle (1913) in *'Coleopterorum Catalogus'* listed four species under the genus *Ipidia* from across the world. Jelínek (1965) differentiated *Ipidia* from the closely related genus *Stelidota* Erichson and dealt with several Palaearctic species of these genera.

Jelínek (1978) described a species of *Ipidia* namely, *I. sjoebergi* from Darjeeling, and which is the first record of the genus from the Indian subcontinent. Kirejtshuk (1992) erected a new subgenus *viz*., *Hemipidia* under *Ipidia*. Kirejtshuk (2005) synonymised three species of *Ipidia* from Japan namely, *I. chujoi* Hisamatsu, 1982, *I. kinabalensis* Hisamatsu, 1982 and *I. krikkeni* Hisamatsu, 1982 with *I. sjoebergi* Jelínek. Jelínek and Audisio (2007) in the *'Catalogue of Palaearctic Coleoptera'* recognised two subgenera under *Ipidia* namely, *Ipidia* (s. str.) and *Ipidia* (*Hemipidia*) Kirejtshuk, 1992. Kirejtshuk (2008) proposed *Ipidia*-complex [which consists of 5 genera namely, *Ipidia* Erichson, 1843, *Platychora* Erichson, 1843, *Taracta* Murray, 1867, *Psilotus* Fischer, 1829 and *Perilopa* Erichson, 1843] under Tribe Nitidulini Erichson, 1843 of the subfamily Nitidulinae.

Till now, only two species *viz*., *Ipidia (Hemipidia) sjoebergi* Jelínek, 1978 and *Ipidia (Ipidia) variolosa* Reitter, 1879 were recorded from India (Darjeeling dist., West Bengal and Arunachal Pradesh respectively).

Some earlier collections of *Ipidia* by one of the authors (TKP in 1988) and other collectors of ZSI (S. W. Kemp in 1911 and 1917; T. Sengupta in 1976; A.R. Bhowmick in 1976; and S. Biswas in 1981 and 1983) from the states of West Bengal, Assam, Meghalaya, and Arunachal Pradesh formed the basis of this study. Two species were studied, and the present paper deals with the systematic account of the genus *Ipidia* from India.

Materials and Methods

Collected specimens of sap beetles were mounted on rectangular hard paper board and pinned with proper locality and habitat data. For detailed morphological study, slides were prepared of the dissected parts. Mounted dry specimen of *Ipidia variolosa* Reitter, 1879 was relaxed first by putting in water for about an hour. The relaxed specimen was placed on glass slide with a drop of water and the hind wings and elytra were dissected out under a dissecting microscope. The wingless body was then placed in 10% KOH solution, after minor incision between pro- and mesothorax and metathorax and abdomen, for about 24 hours. The specimen was then washed in distilled water and mild acetic acid solution for 10 minutes respectively. The washed specimen was passed on to absolute alcohol through 30%, 50%, 70%, 90% grades of alcohol for 5 minutes in each grade. The detached elytra and wings were similarly dehydrated as above. All the parts were kept in absolute alcohol for about 10-15 minutes for complete dehydration and then transferred to clove oil. The body parts of the specimen were then placed on a clear glass slide with a drop of clove oil and finally dissected under a WILD M5A stereoscopic binocular microscope. The dissected parts were mounted in Canada balsam by cover slips. For studying male genitalia of other specimens, their abdomens were separated from the body. The wet/water soaked abdomens were placed in 10% KOH solution for about 24 hours and then passed on to clove oil in above manner. Each of the male genitalia was dissected out with two fine dissecting needles under the stereomicroscope and placed in a drop of Canada balsam on a piece of cover glass. The cover glass was glued on a piece of ivory paper and pinned with the respective specimen with required data. External features and other structures were studied using Leica ® M205A stereoscopic microscope with magnification 7.81× to 160.1× and images were recorded, when necessary. Illustrations were made with the aid of Camera lucida; detailed features of various body parts were sketched by using the digitised images, and examination under an OLYMPUS compound microscope. The materials examined in this study are now housed in the Zoological Survey of India, Kolkata (ZSIC).

Results

Altogether 2 species are recognised under *Ipidia* [*viz*., *Ipidia (Hemipidia) sjoebergi* Jelínek, 1978 and *Ipidia (Ipidia) variolosa* Reitter, 1879]. The genus and its species are characterized and included in the key to the species from India.

SYSTEMATIC ACCOUNT
Family NITIDULIDAE Latreille, 1802
Subfamily NITIDULINAE Latreille, 1802
Tribe Nitidulini Erichson, 1843
Genus *Ipidia* Erichson, 1843

Ipidia Erichson 1843: 289 [Type species: *Ips quadrinotata* Fabricius 1798]; Erichson 1845: 139; Redtenbacher 1845: 74; Redtenbacher 1849: 19, 163; Bach 1851: 201; Lacordaire 1854: 301, 304; Redtenbacher 1858: LXXIX, 328; Jacquelin du Val 1858: 140, 158; Gutfleisch 1859: 233, 236; Thomson 1859: 68; Thomson 1862: 162; Thomson 1867: 377; Seidlitz 1872: 31, 144; Reitter 1873: 10, 54; Redtenbacher 1874: LXXXVI and 360; Reitter 1875: 9; Everts 1881: 12, 30; Reitter 1884: 260, 262; Marseul 1885: 19, 44; Seidlitz 1888a: 19, 44; Everts 1898: 469, 479; Ganglbauer 1899: 463, 465; Stierlin 1900: 519, 529; Reitter 1911: 25, 27; Grouvelle 1913: 130; Jelínek 1965: 218; Jelínek and Audisio 2007: 473; Kirejtshuk 2008: 110.

Description: *General appearance* (Fig. 1–18): Broadly ovoid to somewhat rectangular in shape, somewhat depressed dorsoventrally, rather

shiny; dorsal cuticle punctate and covered with very tiny setae, reddish brown to pitch black; antenna with a compact three-segmented club, pronotal and elytral sides somewhat explanate; each elytron possesses longitudinal striations running from its base to apex; abdominal segments almost entirely covered by elytra dorsally, pygidium rarely visible; adult males possess an additional anal sclerite posteriorly.

Head (Fig. 1) moderately large, transverse, considerably narrower than prothorax and partly inserted within it, mandibles partly exposed, no fronto-clypeal suture; eyes moderately large, projecting, coarsely facetted, tempora indistinct; neck constriction somewhat distinct. Tentorium with two long tentorial arms and a transverse corpotentorium in posterior third. Antenna longer than head; antennal insertions partly concealed under projections of frons, scape subglobular to slightly elongate, segment 2 rather short, segment 3 about twice as long as segment 2, narrower than scape and distinctly elongate, segments 4 to 7 subequal and more or less elongate, segment 8 more transverse and broader than preceding segments; club 3-segmented, slightly longer than broad, segments closely arranged. Ventrally, antennal grooves narrow and subparallel, running longitudinally along inner sides of the eyes. Mandible (Fig. 9) slightly longer than broad, with a large bifid apical tooth on inner margin, mola well-developed, prostheca setose, no distinct mandibular cavity. Maxilla (Fig. 10) devoid of galea; lacinia elongate, apex broadly rounded, apex and inner margin densely hairy; palpi with palpomere 1 narrow-short, palpomere 2 transverse, longer than palpomere 1 and broader than all other palpomeres; palpomere 3 about as long as palpomere 2 and transverse, palpomere 4 (apical segment) longer than preceding palpomeres and fusiform, apex setose. Labium (Fig. 11) with mentum distinctly transverse, punctate-pubescent, apical margin bi-sinuate; ligula transverse with extremeties projecting like a lateral flap on each side; palpi with palpomere 1 narrow-short, palpomere 2 broad-transverse, palpomere 3 subglobular, longer than palpomere 2 with rounded apex. Labrum (Fig. 12) transverse, apical margin arcuate and with a median cleft; dense setae present on apical margin and on dorsal surface near middle.

Prothorax (Fig. 2) transverse, broader posterad, about as broad as elytra; apical margin broadly emarginate; anterior and posterior angles usually projecting; lateral margins arcuate; pronotal disc feebly convex; prosternal process moderately broad, slightly narrower between coxae, distinctly broader near apex, apex almost truncate or broadly rounded; front coxae narrowly separated internally; coxal cavities distinctly transverse, externally and internally closed, trochantins exposed; notosternal sutures extending to anterior angles.

Meso-metathorax (Fig. 3): Mesocoxae not more widely separated externally than front coxae, coxal cavities open outwardly, mesoventral process contacting metaventral process between mesocoxae almost in a straight line. Metaventrite transverse, densely punctate, discrimen extending to about two-thirds of length of metaventrite from base, hind coxae more widely separated than mesocoxae; mesocoxae bordered by coxal lines reaching almost the half of the distance along metaventral-metanepisternal suture, forming distinct axillary space. Metendosternite (Fig. 15) well-developed, with a broad basal stalk, two lateral arms, anterior tendons rather closely situated.

Elytra* and *Wings: Elytra (Fig. 5) elongate, apices separately rounded; punctation distinct, arranged generally in nine longitudinal rows; setae very minute, closely appressed; epipleura moderately developed and extending almost up to apex; pygidium marginally exposed. Wing (Fig. 7) simple and venation reduced, with moderately long radial vein, cubitus vein discontinuous, trace of single anal vein; without subcubital fleck or radial cell.

Legs (Fig. 8) moderately long, trochanters short and simple, femora broadened medially; slender tibiae slightly broadened at apex, with two apical spurs; tarsal formula 5-5-5 in both sexes; tarsomeres 1–3 bilobed, dilated and densely setose apically; tarsomere 4 shortest, claws simple.

Abdomen (Fig. 6) slightly longer than broad, pygidium often not visible from above (concealed beneath elytra); intercoxal process moderately broad and its apex somewhat rounded; ventrites 2–4 short and subequal, ventrite 5 longer than preceding three ventrites.

An anal sclerite (tergite VIII) present in males at the end of 5th ventrite.

Genitalia: Aedeagus (Fig. 16–18) with elongated median lobe, dorsoventrally flattened; a single median strut running along ventral face; tegmen forming an elongate curved plate or hood, with rounded apex and a tuft of long setae arising on either side of middle, lateral edges subparallel, tegminal struts join to form ring. Spiculum gastrale and anal sclerite as in Fig. 13. Ovipositor (Fig. 14) with well-developed paraprocts, valvifers enveloped, coxites, and slender styli attached pre-apically to the coxites.

Sexual Dimorphism: Males possess an anal sclerite at posterior extremity.

Habitat: The species dealt with were collected mostly from subcorticolous habitat or on moist log; feed presumably on the fungi and decomposed plant sap.

Distribution: Distributed mainly in the Palaearctic region and Indo-Burma subregion of the Oriental region.

Key to the species of *Ipidia* of India

1. Body somewhat rectangular. Elytra concolourous, black; strial punctures large, elongate-oval; interstices mostly flat-topped, 7th interstriae distinctly carinate. Male genitalia (Fig. 16–18, 25) with broadly rounded apex of tegmen, spatula-shaped with a dense tuft of setae arising from the ventral side of the apical margin, on either side of the middle of apex; median lobe pear-shaped, apically broad, somewhat narrower at the base, with apex broadly rounded, tip slightly acuminate……..…… ……..***I. (Ipidia) variolosa*** **Reitter**
- Body oblong-ovate. Each elytron with a pair of pale conspicuous spots, one beneath the basal margin and the other below middle near apical one-third; strial punctures minute, rounded; interstices feebly convex and slightly ribbed. Male genitalia (Fig. 20, 22, 23) with tegmen slightly expanded laterally beyond middle and then gradually tapering towards apex, spoon-shaped with small and fine setae arranged on the ventral face of the apical margin, median lobe leaf-shaped, broad at base and narrower apicad, with pointed tip..... ……..***I. (Hemipidia) sjoebergi*** **Jelínek**

Subgenus *Ipidia (Ipidia)* Erichson, 1843

Diagnostic characters:

Body parallel-sided, at least twice as long as wide, prothorax at least twice as wide as long. Elytra flat, sharply curved at the sides at the 7th interstria, which has an appearance of passing through the hump ribs of the shoulder; elytral punctures consist of a regular series of simple points.

1. *Ipidia (Ipidia) variolosa* Reitter, 1879

Ipidia variolosa Reitter, 1879: 215.
Ipidia (Ipidia) variolosa: Kirejtshuk, 2005: 188.

Diagnosis (Fig. 24, 26) elongate, somewhat rectangular, dorsally subdepressed, moderately shiny, colour dark-brown to blackish, lateral edges explanate, sharp longitudinal interstices on each elytron running almost parallel to the elytral suture from base to apex, coarsely punctate cuticle; fine, sparse, white, appressed setae on dorsum.

Head: transverse, exposed part about 1.2x as broad as long, distinctly narrower than prothorax, frons feebly depressed; punctures on vertex round, about 4x as large as those of eye facets; punctation on frons small, round, distinct, diameter about as large as those of eye facets, separated by about 2–3 diameter of punctures; eyes moderately large and moderately projected, about 0.3x as long as head, outer margin rounded, somewhat finely facetted; temple indistinct; setae not visible on head. Antenna about 1.6x as long as head; antennal club about 1.3x as long as broad, club segments compact, about 0.3x as long as antenna.

Prothorax: transverse (l.0:1.7), anterior margin broadly emarginate; sides arcuate, posterior margin bisinuate, anterior angles obtuse, posterior angles rather sharply pointed, slightly projected posteriorly. Pronotum rather convex,

PLATE- I

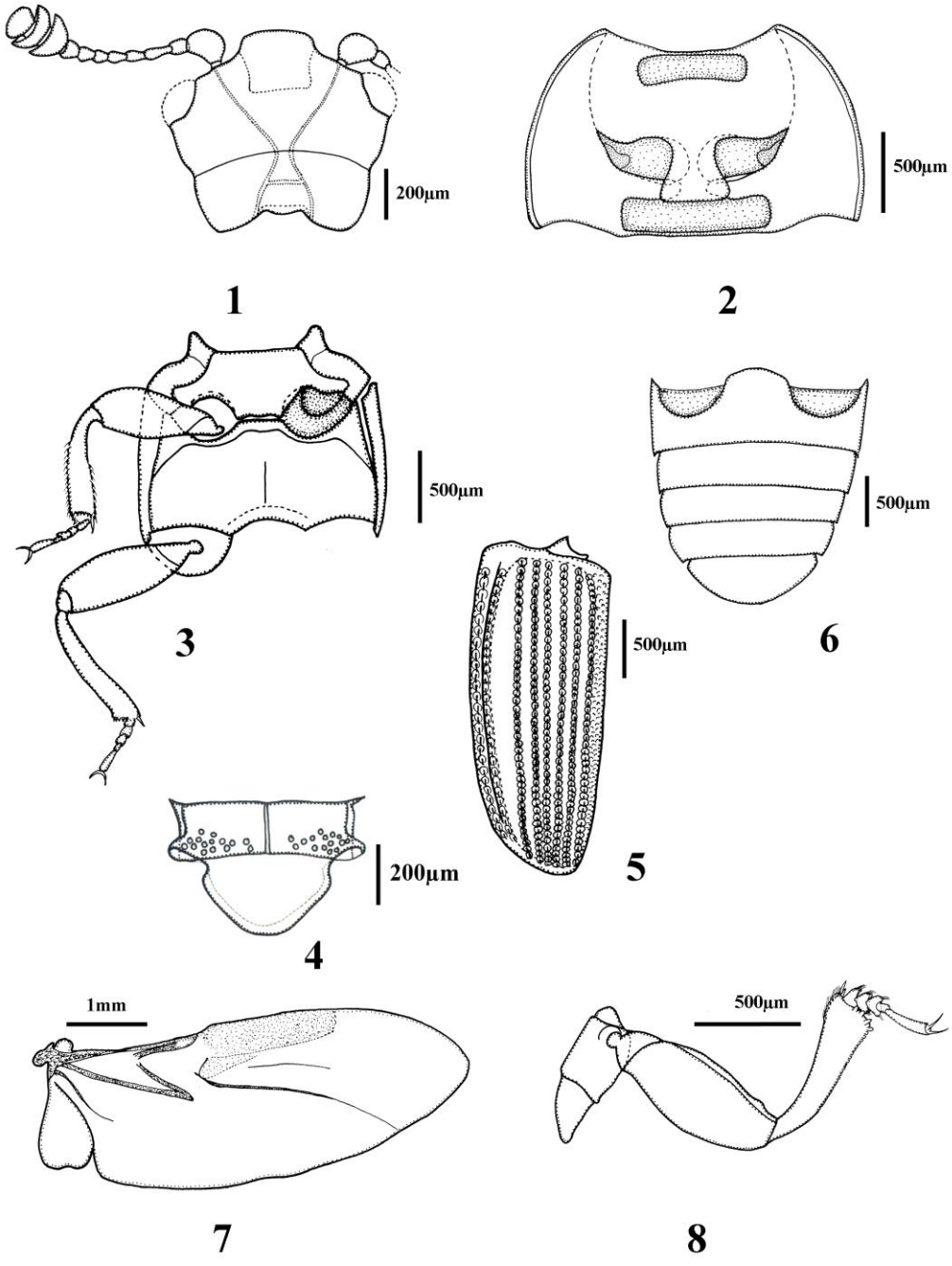

PLATE I. Figs. 1–8. *Ipidia variolosa* Reitter, 1879: 1, Head, Dorsal view; 2, Prothorax, Ventral view; 3, Meso-metathorax, Ventral view; 4, Scutellum, Dorsal view; 5, Left elytron, Dorsal view; 6, Abdomen, Ventral view; 7, Wing; 8, Front leg.

PLATE- II

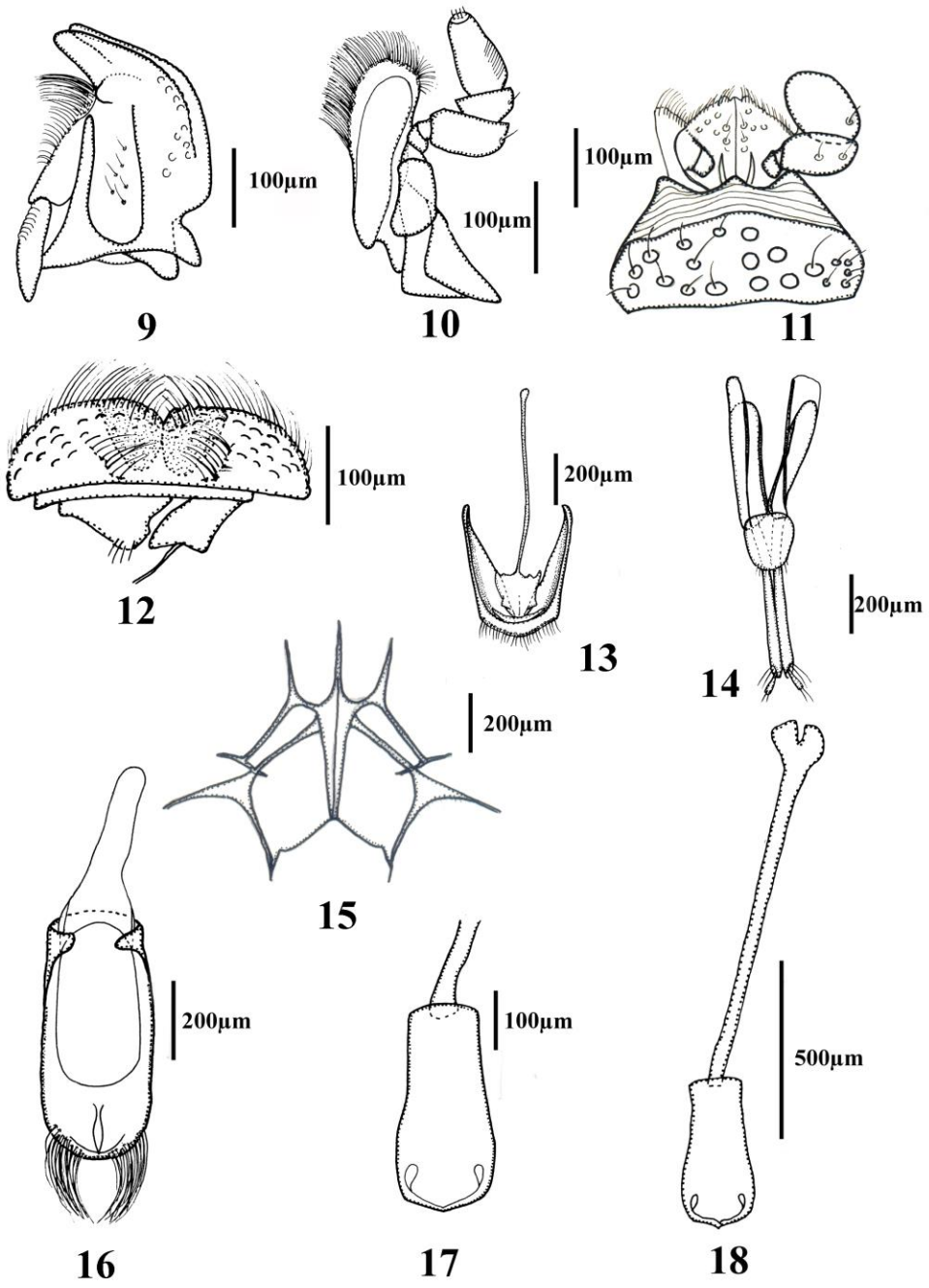

PLATE II. Figs. 9–18. *Ipidia variolosa* Reitter, 1879: 9, Mandible, Dorsal view; 10, Maxilla, Ventral View; 11, Labium, Ventral view; 12, Labrum, Dorsal view; 13, Spiculum gastrale and last abdominal ventrite, Ventral view; 14, Ovipositor, Ventral view; 15, Metendosternite; 16, Male genitalia: Tegmen, Ventral view; 17, Male genitalia: Median lobe, Ventral view; 18, Male genitalia: Median lobe along with median strut.

surface distinctly punctate, punctures of two types- large, about 3x as large as those on vertex, separated by 0.5–2 diameters; large punctures, intermixed with smaller, round and dense punctures, about the size of eye facets, separated by 1–3 diameters; very fine, appressed setae on disc.

***Scutellum*:** transverse, about 2x as humeral angles nearly right-angled, sides subparallel from base to apical one-fourth and gradually converging towards apex, borders explanate, apices separately rounded; punctures of two types: large, elongate-oval, closely arranged in longitudinal rows from base to apex, about 3x as large as those on vertex; these large punctures intermixed with smaller, round and dense punctures, about the size of eye facets, separated by 1–2 diameters of punctures; about nine longitudinal flat-topped interstices run from base to apex of each elytron with the 7th interstria forming a hump near humeral region of elytra; setae not visible. Abdominal tergites fully covered by the elytra. *Legs* moderately long, femora robust, tibiae with denticulate lateral edge, tarsomeres bilobed with dense setae on apical margin.

Ventral: side reddish-brown. Prosternal process with broadly rounded apex, reaching up to mesosternum.

Aedeagus (Fig. 16–18, 25): Tegmen broadly elongate with rounded apex, spatula-shaped with a dense tuft of setae arising from the ventral face of the apical margin, on either side of the middle of apex. Median lobe pear-shaped, apically broad, somewhat narrower at the base, with apex broadly rounded, slightly pointed at the middle and a distinct median strut extending from the base of the median lobe.

Measurements (in mm.): Total length 3.66–5.24, width of head across eyes 0.59–0.73, length of antenna 0.88–1.14, length and width of prothorax 1.35–1.44 and 2.31–2.51, length and width of elytra 2.31–3.19 and 1.85–2.47.

Material examined: 18 ex. INDIA: Arunachal Pradesh, Rotung, 1400 ft. (427m.), Abor Expedition, 1 ex., 07–08.iii. 1912, S. W. Kemp, ex. under bark, Det. by Grouvelle (ZSIC); L. Subansiri Survey, 4km-O-Kimin, 4 ex, 21.ix.1988, T. K. Pal and party, ex: under bark; Namdapha Survey, Zero camp, 5 ex, 08.v.1981, S. Biswas and party (ZSIC); Namdapha, Tirap Distt., Gibbon's land, 2 ex, 31.xii.1983, S. Biswas and party (ZSIC); Namdapha Survey, Deben, 27 km. E-o-Miao, Tirap Distt., 3 ex, 05.xii.1983 (ZSIC); Assam, Dibrugarh, Abor Expedition, 1 ex., 11–19.xi.1911, S. W. Kemp [Reg. No. 2551/19] (ZSIC); West Bengal, Jalpaiguri Distt., Lankapara, 2 ex, 27.viii.1986, T. K. Pal and party, ex: under bark (ZSIC); West Bengal, Jalpaiguri Distt., Gairkata, 2 ex., 31.x.1976, Collector- Unknown (ZSIC).

Distribution: INDIA: Assam [New Record], West Bengal [New Record], Arunachal Pradesh; MYANMAR; THAILAND; VIETNAM; TAIWAN; JAPAN; KOREA; CHINA; RUSSIA.

Subgenus *Ipidia (Hemipidia)* Kirejtshuk, 1992
Diagnostic characters:

Body oval, less than twice as long as wide, prothorax at least twice as wide as long. Sides of elytra smoothly rounded, their 7th interstria hardly more distinct than others, elytral punctures variable.

2. *Ipidia (Hemipidia) sjoebergi* Jelínek, 1978

Ipidia sjoebergi Jelínek, 1978: 199.
Ipidia (Hemipidia) sjoebergi: Kirejtshuk, 1992: 64.

Diagnosis (Fig. 19, 21) oblong-ovate, moderately convex and shiny, colour testaceous brown to dark brown, lateral margin moderately explanate, presence of feebly convex and slightly ribbed longitudinal interstices on each elytron almost parallel to each other and converging towards apex; coarsely punctate cuticle; very fine, tiny, sparse, white, closely appressed setae present near the lateral edges of dorsum.

Head: transverse, exposed part about 1.4x as broad as long, distinctly narrower than prothorax, frons somewhat depressed; punctures on vertex round, about twice as large as those of eye facets; punctation on frons round, distinct, diameter about twice as large as those of vertex, separated by about 0.25–0.5 diameter of punctures; eyes moderately large and laterally

PLATE- III

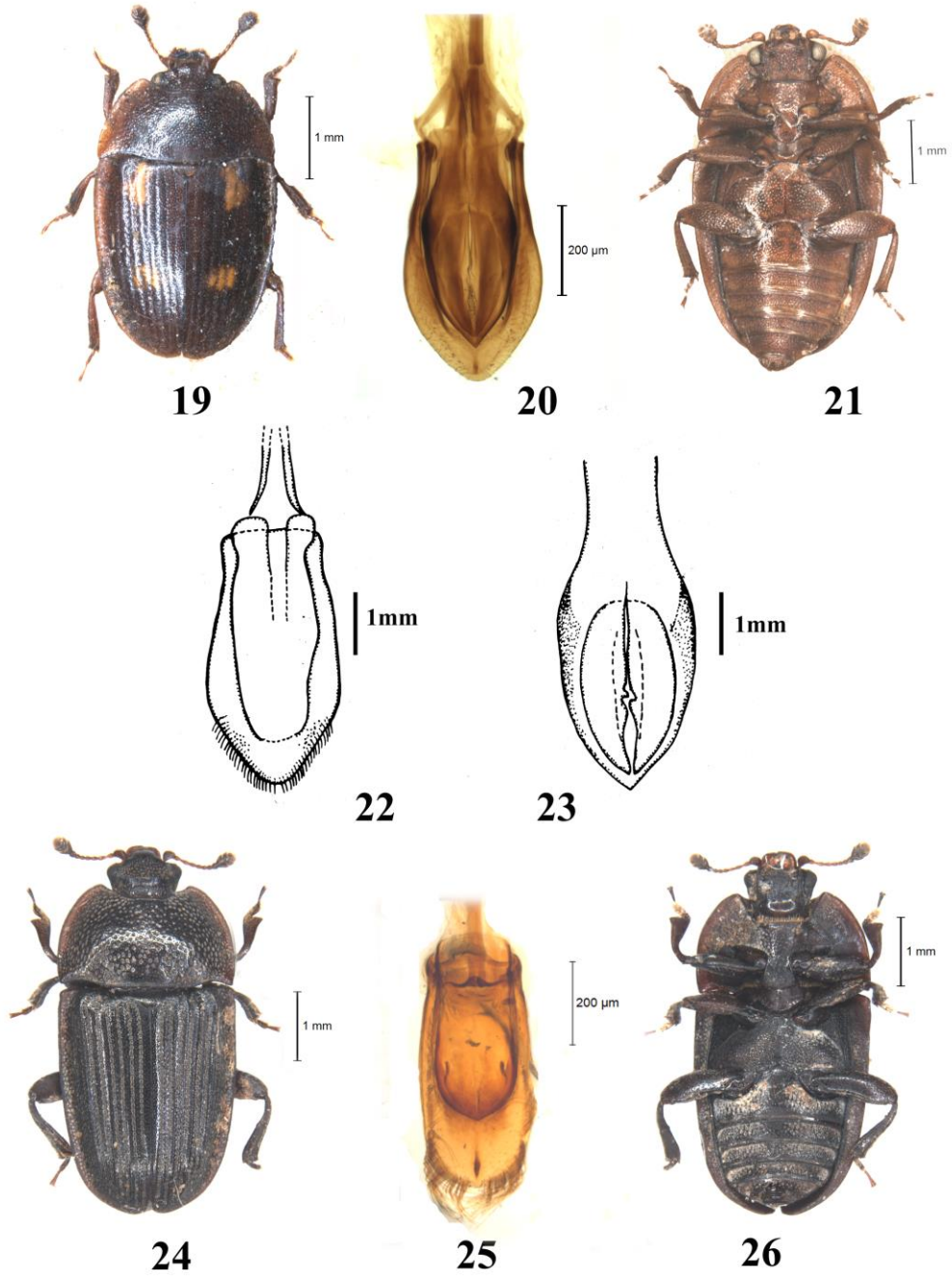

PLATE III. Figs. 19–26. *Ipidia sjoebergi* Jelínek, 1978: 19, Dorsal view (photograph); 20, Male genitalia (photograph); 21, Ventral view (photograph); 22, Male genitalia: Tegmen, Ventral view; 23, Male genitalia: Median lobe, Ventral view; 24–26. *Ipidia variolosa* Reitter, 1879: 24, Dorsal view (photograph); 25, Male genitalia (photograph); 26, Ventral view (photograph).

projected, about 0.4x as long as head, outer margin rounded, coarsely facetted; temple indistinct; few short, white, appressed setae on head. Antenna about 1.9x as long as head; antennal club about 1.3x as long as broad, club segments compact, about 0.3x as long as antenna. *Prothorax* transverse (l.0:2.0), about twice as broad as long, anterior margin broadly emarginate; sides arcuate, posterior margin bisinuate, anterior angles obtuse, posterior angles rather sharply pointed. Pronotum subconvex, surface distinctly punctate, punctures of two types- large, round, scattered, about as large as those on frons, separated by 0.5–2 diameters; large punctures intermixed with smaller punctures, about the size of eye facets, separated by 1–2 diameters; very fine, appressed setae on disc.

***Scutellum*:** transverse, about 1.7x as broad as long, triangular and somewhat rounded apically; finely punctate, punctures about half the size of eye facets, setae indistinct. *Elytra* about 1.1x as long as broad, anterior margin closely fit with posterior margin of prothorax, humeral angles nearly right-angled, sides arcuate, borders moderately explanate, apices separately rounded; punctures of two types: minute, round, about as large as the eye facets, separated by 0.25–0.5 diameters, arranged in longitudinal rows; these punctures intermixed with smaller, round and scattered punctures, about half the size of large punctures, separated by 1–2 diameters; setae fine, short, sparse, appressed and posteriorly directed; interstices feebly convex and slightly ribbed. Abdominal tergites usually fully covered by the elytra. *Legs* moderately long, femora robust, tibiae with denticulate lateral edge, apical margin bears spicules, tarsomeres with dense setae on apical margin. Mid and hind legs bear two longitudinal rows of setae running from base to apex of tibiae.

Ventral side: reddish-brown. Prosternal process with broadly rounded apex, reaching upto mesosternum.

Aedeagus (Fig. 20, 22, 23): Tegmen broadly elongated, slightly expanded laterally behind middle and then gradually tapering towards apex, spoon-shaped with small and fine setae arranged on the ventral face of the apical margin, tegminal struts join together anteriorly making a V-shaped ring around the median lobe. Median lobe leaf-shaped, narrow at apex and broad at base, with apex pointed, a median strut extending from the base of median lobe.

Measurements (in mm): Total length 3.62, width of head across eyes 0.62, length of antenna 0.88, length and width of prothorax 1.01 and 2.12, length and width of elytra 2.31 and 2.15 (n=1).

Material examined: 3 ex., INDIA: Meghalaya, Garo Hills, above Tura, 3500–3900 ft. (1066–1188 m), 1 ex., 15.vii.–30.viii.1917, S. W. Kemp, *ex:* on fallen log (ZSIC); West Bengal, Darjiling Distt., Garubathan, 2 ex., 10.iv.1976, A. R. Bhowmick & party, *ex:* under bark (ZSIC).

Distribution: INDIA: Meghalaya (Garo Hills) [New Record], West Bengal (Darjiling); NEPAL; BHUTAN; MALAYSIA (Borneo); INDONESIA (Java); TAIWAN.

Concluding remarks

Ipidia is comparatively a small genus with very few representatives recorded from India. Of these, majority were found from North-eastern states of India. *Ipidia* is closely related morphologically to another genus, *Stelidota* Erichson, 1843 by its elytral striations and body shape but can be differentiated from the latter by its feebly emarginate labrum, third antennomere at the most 2x as long as broad, prosternal process flatly rounded at apex and arcuate coxal lines on metaventrite [*vs*., deeply emarginate labrum, third antennomere more than 2.5x as long as broad, prosternal process rounded at apex, coxal lines on metaventrite angulate in *Stelidota* Erichson, 1843]. A detailed comparison of these genera would be cited while dealing with the Indian fauna of *Stelidota* Er. in near future.

Acknowledgements

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