

REDESCRIPTION OF TWO SPECIES OF GENUS *DERMATOXENUS* MARSHALL (ENTIMINAE: CURCULIONIDAE: COLEOPTERA) FROM INDIA

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ABSTRACT

Two species of the genus *Dermatoxenus* Marshall (1916) (Curculionidae: Entiminae) are revised from India. The generic and species descriptions are updated through addition of measurements, description of elytral vestiture and genitalic characters. These are supported by 35 illustrations including 26 line diagrams. In addition, annotated checklist and a modified key to the species are also provided.

INTRODUCTION

The broad nosed weevils of the subfamily, Entiminae with more than 12000 species described, are the largest group of weevils and they are distributed worldwide. Except for some larger genera like *Myloccerus*, *Tanymecus*, *Dereodus*, *Lepropus*, *Episomus* and *Indomias*, the entimines are poorly studied. The genus *Dermatoxenus* comes under the Entiminae, which is taxonomically important and poorly studied in India. The only substantial contribution on this genus had come from Marshall (1916). The available information is limited and is lacking in essential diagnostics especially genitalia and elytral vestiture. Even in those species where detailed descriptions are available these lacking in morphometrics and need for more material is explicit. Keeping this in view, the present study is proposed to address the gaps in existing knowledge through improving the descriptions by studying the taxonomic characters in a comprehensive manner and by including genitalia and elytral vestiture. All taxonomic characters required attention had to be illustrated and keys improved with the objective of quick and authentic identification of species.

This genus first described under Cyphides of Brachyderinae was categorized under Blosyrini of subfamily Brachyderinae by Emden (1944), and had been brought under Entiminae (Thompson, 1992). Presently it falls under Dermatodini of Entiminae (Alonso-Zarazaga and Lyal, 1999). When Marshall (1916) redescribed it stated that scape not exceeding the anterior margin of the eyes, hind tibial apex without an apical spine are important diagnostic characters distinguishing it from

Eustalida. This is in contrast to the findings of the present study that hind tibial apex is having an apical spine. Also the present study had integrated morphometric ratios and genitalic characters to its description. It is entirely Oriental in its distribution, with Indonesia (six species), Japan (four species), Myanmar (three species), India, China (two species each), Taiwan, Thailand, Malaysia and Cambodia (one species each) as the localities known. From India, two species known are mainly from Assam, Manipur, Meghalaya, Nagaland, Sikkim and West Bengal. All these details have been brought to the fore in the present study so that it can form the basis for future studies.

MATERIALS AND METHODS

Voucher material including types are deposited with National Pusa Collection (NPC) of the Division of Entomology, Indian Agricultural Research Institute, New Delhi. All the taxonomic characters, except the genitalia and ultra structure of elytral vestiture were studied using intact specimens. For the study of genitalia, specimens processed following the method of Supare *et al.* (1990) with slight modifications. For the studying the elytral vestiture, the method of Ramamurthy and Ghai (1988) was followed. The terminology after Supare *et al.* (1990), Thompson (1992), Poorani and Ramamurthy (1997) and Wanat (2007) were followed for the description of male and female genitalia. WILD M8 stereozoom microscope, Leica MZ 16A stereozoom microscope, LEITZ ORTHOLUX II interference, phase contrast, compound microscope, and Leica DFC-290 camera attached with Leica application suit

ver. 2.8.2 were used in the taxonomic studies. Illustrations were made using a drawing tube fitted with a camera lucida.

RESULTS AND DISCUSSION

Annotated checklist (Table 1)

Taxonomic studies

Genus *Dermatoxenus* Marshall, 1916: 50 (Gender: Masculine)
Type species: *Lagostomus vermiculatus* (Gyllenhal in Schoenherr, 1833); designated by Marshall, 1916: 51; Alonso-Zarazaga and Lyal, 1999: 154.

Genus description: Head exerted, more or less constricted and transversely im-pressed behind the eyes, eyes 1.40x longer than broad, ovate or almost circular and prominent, frons with a deep central furrow. **Rostrum** 1.53 – 1.78x longer than head, its base 0.99x shorter than frons, 1.15 – 1.21x dilated at apex, separated from head by a transverse stria or furrow (Figs. 1, 2), scrobes curving downwards far in front of eyes, epistome large and bare, acuminate behind and shallowly emarginate at apex, mandibles slightly prominent, scar small and indistinct, buccal cavity behind the mandibles almost square, mentum large but not quite filling cavity, submentum

subtruncate and without any peduncle. **Antennae** inserted at or before middle of rostrum, scape clavate, curving forwards when erect, not or only just reaching anterior margin of eye (Fig. 3), first and second funicle segments 1.79x longer than others, club 2x longer than broad, ovate and three segmented. **Prothorax** bisinuate at posterior margin, narrower and subtruncate at anterior margin, anterior margin not sinuate ventrally. **Scutellum** present or absent. **Elytra** separately rounded at basal margin, with a distinct humeral angle, subacuminate at apex, margin deeply sinuate above posterior coxae, and with ten striae. **Elytral vestiture** of two types, predominant subrectangular to ovate or subcircular, less predominant elongate or very elongate, pale yellowish to dark brown colour. **Sternum** with epimeron of mesosternum much smaller than its episternum, metasternum as long as or 1.53x longer than middle coxae, episternum present but sometimes very narrow, posterior coxae reaching elytra. **Venter** with intercoxal process ogival, second ventrite 1.40x longer than third or fourth separately, and divided from first by a deep straight incision. **Legs** elongate, femora clavate, fore tibiae curved and with a short internal spine at apex (Fig. 10), tibial apex of the hind legs enclosed and with or without scales

Table 1: Checklist of the genus *Dermatoxenus* Marshall of the world

1.	<i>binodosus</i> Marshall, 1916: 51	Myanmar
2.	<i>caesicollis</i> (Gyllenhal) <i>Lagostomus caesicollis</i> Gyllenhal in Schoenherr, 1833: 619; Marshall, 1916: 51 <i>Dermatodes caesicollis</i> Gyllenhal in Schoenherr, 1840: 898; Marshall, 1932: 211 <i>Cneorhinus nodosus</i> Motschulsky, 1860: 21; Marshall, 1916: 51 <i>Dermatodes nodosus</i> Motschulsky, 1866: 179; Marshall, 1916: 51 <i>Catapionus nodosus</i> Touriner, 1876: 153; Marshall, 1916: 51	China, Japan and Taiwan
3.	<i>candidus</i> Heller, 1896: 17	Indonesia
4.	<i>carinulatus</i> Motschulsky, 1866: 179	Japan
5.	<i>chrysochlorus</i> (Ritsema) <i>Dermatodes chrysochlorus</i> Ritsema, 1882: 177; Marshall, 1932: 211	Indonesia
6.	<i>clathratus</i> (Roelofs) <i>Catapionus clathratus</i> Roelofs, 1873: 157; Marshall, 1916: 51 <i>glaucopustulatus</i> Heller see <i>vermiculatus</i> subsp. <i>glaucopustulatus</i> <i>helleri</i> Marshall, 1916: 54	Japan
7.	<i>helleri</i> subsp. <i>simplex</i> Marshall, 1916: 55	India
7a	<i>helleri</i> subsp. <i>subrotundus</i> Marshall, 1916: 55	India
7b		India
8.	<i>hians</i> Marshall, 1932: 210	Thailand and Malaysia
9.	<i>indicus</i> Marshall, 1916: 53	India
10.	<i>interstitialis</i> Motschulsky, 1866: 179	Japan
11.	<i>lithocollus</i> Heller, 1915: 216	Indonesia
12.	<i>marmoresus</i> Marshall, 1941: 346	Myanmar
13.	<i>quadrisignatus</i> Marshall, 1916: 52	Myanmar
14.	<i>ritsemai</i> Heller <i>Dermatodes ritsemai</i> Heller, 1915: 214; Marshall, 1916: 51 <i>rosceipes</i> Heller see <i>vermiculatus</i> subsp. <i>rosceipes</i>	Indonesia
15.	<i>scutellus</i> Heller, 1915: 212	Cambodia
16.	<i>sexnodosus</i> Voss, 1932: 60 <i>simplex</i> Marshall see <i>helleri</i> subsp. <i>simplex</i> <i>subrotundus</i> Marshall see <i>helleri</i> subsp. <i>subrotundus</i>	China
17.	<i>vermiculatus</i> (Gyllenhal) <i>Lagostomus vermiculatus</i> Gyllenhal in Schoenherr, 1833: 619; Marshall, 1916: 51 <i>Dermatodes vermiculatus</i> Gyllenhal in Schoenherr, 1840: 898; Marshall, 1932: 211	Indonesia
17a	<i>vermiculatus</i> subsp. <i>glaucopustulatus</i> Heller, 1915: 209	Indonesia
17b	<i>vermiculatus</i> subsp. <i>rosceipes</i> Heller, 1915: 215	Indonesia

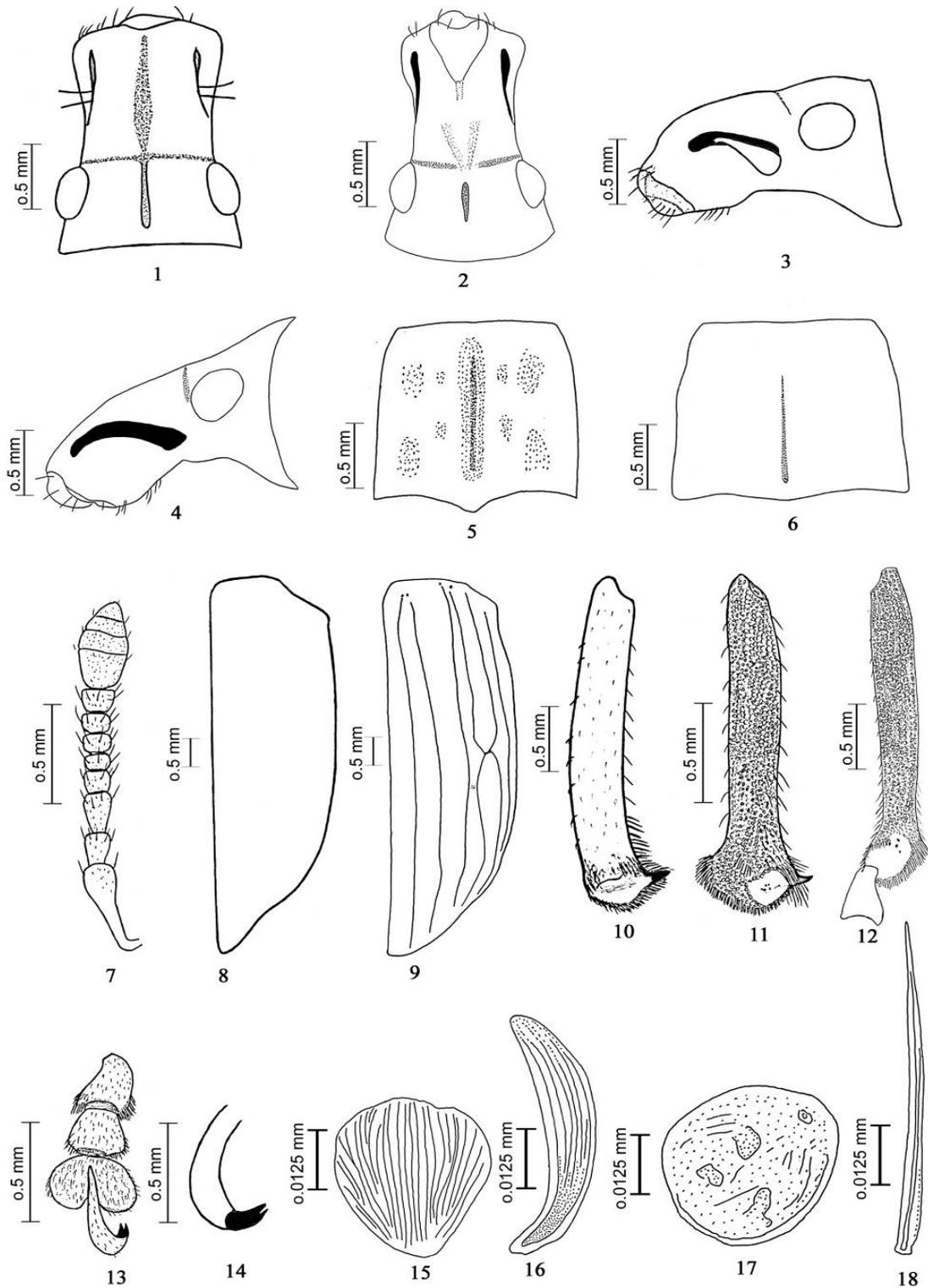


Figure 1 to 18: *Dermatoxenus*. Head, dorsal view: 1. *indicus*, 2. *helleri*, lateral view: 3. *indicus*, 4. *helleri*; Prothorax, dorsal view: 5. *indicus*, 6. *helleri*; 7. Antenna of *Dermatoxenus indicus*; Elytron, dorsal view: 8. *indicus*, 9. *helleri*; 10. Fore tibiae of *Dermatoxenus*; Hind tibial apex: 11. *indicus*, 12. *helleri*; 13, 14. Tarsi and claw of *Dermatoxenus*; Elytral vestiture: 15, 16. *indicus*, 17, 18. *helleri*

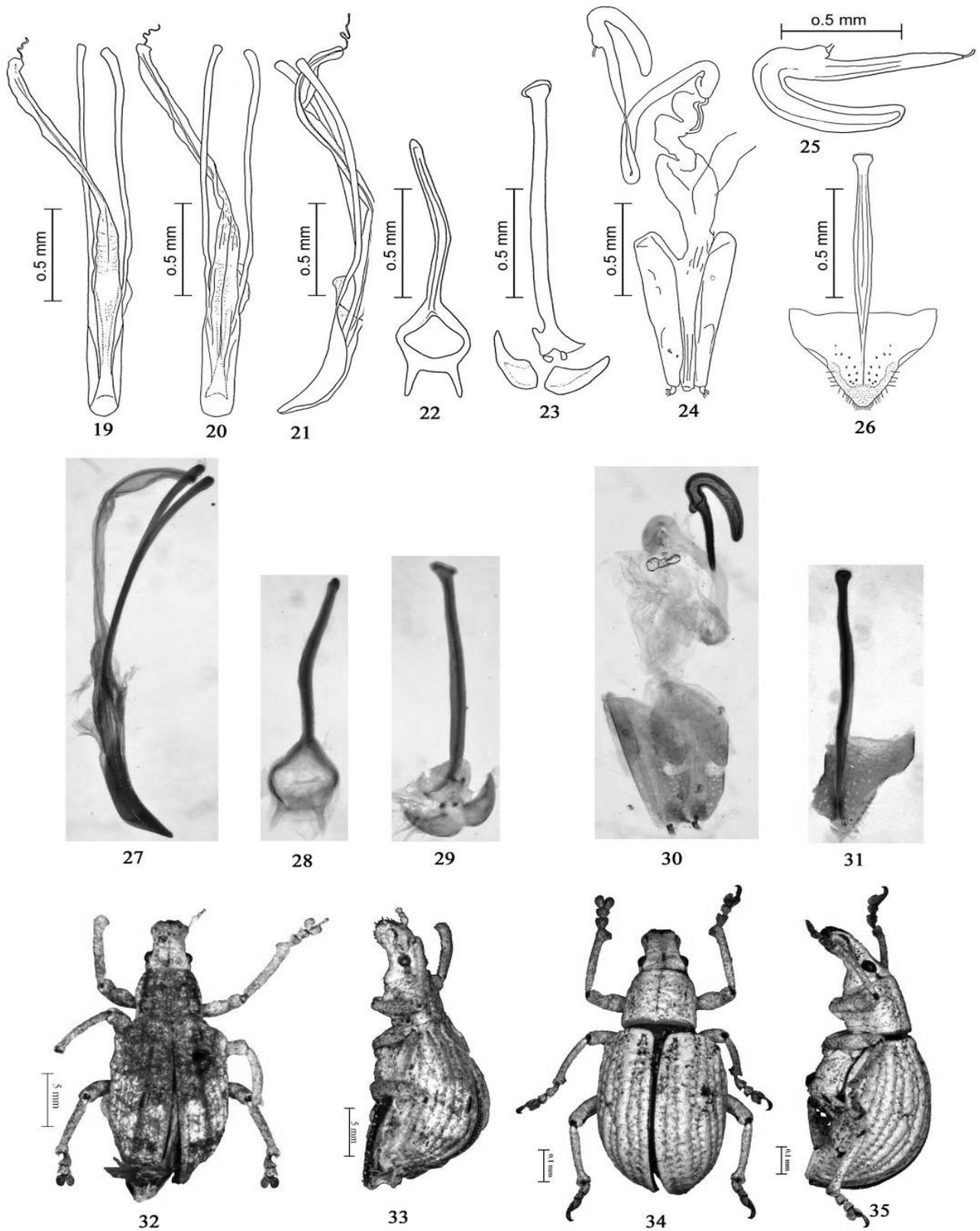


Figure 19 to 35: *Dermatoxenus*. 19 – 23, 27 – 29. Male genitalia, median lobe, dorsal, ventral and lateral views, tegmen and spiculum gastrale of *Dermatoxenus indicus*; 24 – 26, 30 – 31. Female genitalia, genital chamber, spermatheca and spiculum ventrale of *Dermatoxenus helleri*; Dorsal and lateral view habitus: 32, 33. *indicus*, 34, 35. *helleri*

internally (Figs. 11, 12), tarsi with third segment very broadly lobate, fourth elongate, claws connate at base (Figs. 13, 14).

Female genitalia having spermatheca with proximal arm 1.37x longer than distal arm, ramus and nodulus projecting out, cornu with rounded apex, spiculum ventrale elongate with clubbed apex. **Male genitalia** with aedeagus 1.42x longer than apophyses, median lobe sclerotized, tegmen with acuminate parameres, and spiculum gastrale with apex clubbed.

Key to species (modified after Marshall, 1916)

1. Scutellum distinct, elytra with larger rounded tubercle at top of the declivity on third interval *binodosus*
- Scutellum invisible, elytra without tubercles (Figs. 32-35).....2
2. Hind tibial apex densely squamose inside (Fig. 11), shoulders of elytra prominent, prothorax with a central furrow (Fig. 5); fore coxas in middle of the prosternum.....3
- Hind tibial apex bare, shoulders of elytra not prominent (Fig. 12), prothorax without a central furrow (Fig. 6), fore coxae nearer anterior margin of the prosternum..... *helleri*
3. Eye situated midway between anterior margin of head and posterior constriction. Elytron with two large bare rugose black patches on intervals fourth and fifth..... *quadrisignatus*
- Eye much nearer to anterior margin of head, elytra without bare patches, prothorax as long as broad (Fig. 5), aedeagus 1.42x as long as apophyses, 3.4x as its median lobe, median lobe sclerotized and slightly curved (Figs. 19, 20, 21, 27)..... *indicus*

Species description

1. *Dermatoxenus indicus* Marshall

(Figs. 1, 3, 5, 7, 8, 11, 15, 15, 16, 19, 20, 21, 22, 23, 27, 28, 29, 32 and 33)

Dermatoxenus indicus Marshall, 1916: 53 [BMNH].

Description

General colour black, with dense brown vestiture, turning to pale fawn, greyish or whitish on laterally, underparts and at apex, upper surface of elytra usually variegated with similar pale markings, especially across top of declivity (Figs. 32, 33).

Head evidently constricted and transversely impressed at base, eyes placed close to anterior margin, frons with a deep central furrow, 0.53x as long and 1.16x as broad as rostrum, 0.39x as long and 0.7x as broad as prothorax. **Rostrum** 1.48x as long as the breadth at base of rostrum and 1.05x as long as breadth at base of head separated from head by a narrow transverse furrow, sides parallel at base, genae sharply angulated, upper surface shallowly impressed and with a deep central furrow (Figs. 1, 3). **Antennae** with dense pale vestiture, scape not reaching eye, second segment longest, 1.31x, 1.89x, 2.13x, 1.89x as long as first, third, fourth, fifth and sixth and seventh, respectively; in terms of breadth, seventh segment broadest of all, 1.2x as broad as first to sixth segment. Club 2.24x as long as second, and 4.23x as long and 1.59x as broad as seventh segment of funicle (Fig. 7).

Prothorax 1.38x as long as and 1.66x as broad as rostrum, as broad as long, widest at base and gradually narrowing to apex, base 1.36x as broad as apex, transversely rugose, with a distinct central furrow varying in length and depth, and a similarly variable furrow on each side of it (Fig. 5). **Legs** with dense vestiture, tarsi broad, hind tibial apex densely squamose internally (Fig. 11).

Elytra 3.09x as long as rostrum, 2.25x as long and 1.58x as broad as prothorax, 0.86x as that of its breadth at base, separately rounded at base, shoulders broad and prominent, sides subparallel, striae deep with large punctations which partially concealed by the very dense vestiture, intervals broad and convex, third interval broader than fourth, setae very short, thick, sparse and depressed (Figs. 8, 32, 33). Elytral vestiture of two types, predominant flat, subrectangular to ovate, with granulated surface, and brown to dark brown (Fig. 15), less predominant elongate, spindle shaped, granulated at basal half, opaque and brown (Fig. 16).

Venter with first ventrite longest, 1.94x, 2.82x and 1.3x as long as second, third and fourth and fifth, respectively; in term of breadth, first the broadest, 1.2x, 1.49x, 1.91x and 2.35x as broad as second, third, fourth and fifth, respectively.

Male genitalia with **aedeagus** 1.42x as long as apophyses, 3.4x as its median lobe, 1.85x as long as spiculum gastrale, 2.05x as long as tegmen, median lobe sclerotized, slightly curved in lateral view, apex bluntly pointed, 2.12x as long as manubrium, its base 1.08x as broad as middle and 1.25x as broad as the breadth just before apex, breadth at middle 1.17x as broad as the breadth just before apex, breadth from sides 2.75x as broad as that of apophyses. **Apophyses** as broad as manubrium (Fig. 19, 20, 21, 27). **Tegmen** 2.03x as long as manubrium, parameres acuminate, manubrium uniformly thick, bent at middle, apex bluntly pointed (Fig. 22, 28). **Spiculum gastrale** 0.77x as long as apophyses and 1.11x as long as tegmen, slightly curved at base, uniformly thick with apex clubbed, 1.2x as broad as apophyses and 1.2x as broad as that of manubrium (Fig. 23, 29).

Length: 10.44 mm.; **breadth:** 3.79 mm.

Specimens examined: **Assam:** Assam, date unknown, Zool. Mus. Berlin; **West Bengal:** Lebong, 5000 ft., vi.1909, Coll. H.M.L.; x.1908, Coll. H.M.L.

Distribution: INDIA: Assam; Nagaland: Naga Hills; West Bengal: Lebong, Mungpu.

2. *Dermatoxenus helleri* Marshall (Fig. 2, 4, 6, 12, 17, 18, 24, 25, 26, 30, 31, 34, 35)

Dermatoxenus helleri Marshall, 1916: 55 [BMNH ♀, ♂].

Description

General colour black, with uniform pale green, grey or sandy vestiture (Figs. 34, 35). **Head** with basal constriction and impression shallow, 0.66x as long and 1.48x as broad as rostrum, 0.51x as long and 0.75x as broad as prothorax, eyes a little nearer to front margin than to constriction, frons with a narrow furrow. **Rostrum** 1.43x as long as the breadth at base of rostrum and 0.97x as long as the breadth at base of head, separated from head by a fine furrow on each side, furrows usually separated on disk, but sometimes meeting to form a slight angle, genae broadly but bluntly angulated, upper surface with a broad, shallow, longitudinal impression (Figs. 2, 4). **Antennae** comparatively slender, with pale green or grey

vestiture, scape just reaching the eye, funicle with first segment a little shorter than second, segments third to seventh subequal and not transverse, club black and with first segment longer than second.

Prothorax 1.31x as long as and 1.97x as broad as rostrum, 1.06x broader than long, broadest at base, base 1.41x as broad as apex, sides subparallel from base to beyond middle, then rather sharply narrowed in ♀, less sharply in ♂ upper surface quite smooth, with a faint central carina and often a shallow impression on each side of it, and with scattered, small, black punctations (Fig. 16). **Legs** with dense green vestiture and small black spots, hind tibial apex not squamose inside, second segment of hind tarsi not transverse.

Elytra 3.51x as long as rostrum, 2.69x as long and 1.63x as broad as prothorax, 2.49x as that of its breadth at base, jointly sinuate in middle of base, shoulders obtuse and not very prominent, sides more strongly rounded, broadest far behind middle, striae broad and with large deep punctations, filled in with vestiture that striae appear narrow and punctations faint and shallow, first and second and third and fourth striae converging at base, intervals convex, with small, dark, punctations containing minute setae, alternate ones more raised, third interval broadly interrupted twice behind middle, fifth interrupted at middle, and seventh on declivity, these interruptions variable, striae first and second contain rows of distinct shiny granulations at their basal half (Figs. 9, 34, 35). Elytral vestiture of two types, predominant flat, subcircular, granulated and pale yellow or white with brown tinges (Fig. 17), less predominant very elongate, hair like, with short pedicel and light brown (Fig. 18).

Venter with first ventrite longest, 1.88x, 3x and 1.2x as long as second, third and fourth and fifth, respectively; in term of breadth, first the broadest, 1.14x, 1.45x, 1.79x and 2.28x as broad as second, third, fourth and fifth, respectively.

Female genitalia having **spermatheca** with proximal arm 1.37x as long as distal arm, nodulus and ramus projecting out, tubular with pointed apex, ramus small, its apex blunt, cornu slightly bent, apex rounded, projecting close towards proximal arm (Figs. 24, 25, 30). **Spiculum ventrale** with shaft elongate, apex clubbed, 1.72x as long as basal plate, basal plate 1.39x as broad as long, apex bluntly pointed, with numerous hairs (Figs. 26, 31).

Taxonomic note: Marshall (1916) states that third interval broadly interrupted twice behind middle, fifth interrupted at middle, and seventh on declivity, and than these interruptions variable. But examination of the specimen, which is compared with type, shows that there is only one interruption at third interval about middle, others absent.

Length: 14.11 mm.; **breadth:** 4.88 mm.

Specimen examined: Assam: date unknown, Zool. Mus. Berlin.

Distribution: INDIA: Assam; Manipur: Ukhrul (6500 ft.); Meghalaya: Shillong, Khasi hills, Chirapunji; Sikkim: Rangbong valley; West Bengal: Gopaldhara.

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