



## REVIEW OF THE GENUS *HEMERUS* MARSHALL (COLEOPTERA: CURCULIONIDAE: ENTIMINAE) FROM INDIA

TARUN KUMAR\*, NIDHI SANWAL, SHALOO AYRI AND V.V. RAMAMURTHY

AICOPTAX-Coleoptera, Division of Entomology,  
Indian Agricultural Research Institute, New Delhi 110012  
\*E-mail: tarunbiotech246@gmail.com

### ABSTRACT

The Cyphicerini weevil genus *Hemerus* Marshall (Curculionidae, Entiminae) is herein reviewed, and its lone species, *Hemerus virens* Marshall is redescribed. The salient taxonomic characters at the genus and species level are described and illustrated.

**Key words:** Entiminae, genus redescription, *Hemerus*, Punjab, India

In 1944, Marshall established the monotypic genus *Hemerus* based on *Hemerus virens* Marshall. This short snouted Entiminae weevil, is currently placed in the tribe Cyphicerini Lacordaire (1863) under the subfamily Entiminae (Alonso Zarazaga and Lyal, 1999). This species is known from north India. Marshall (1944) described 29 genera of the tribe Cyphicerini belonging to the subfamily Eremninae. Of these the genus *Hemerus* Marshall is with only two setae on the mentum, prothorax trapezoidal, much wider at base than at apex, and second funicle segment shorter than first. In 1990, Pajni redescribed this genus with *H. virens* under the subfamily Eremninae in his work 'Fauna of India'. This description is inadequate and does not include illustrations of diagnostic significance.

### MATERIALS AND METHODS

Specimens included in the study are from the National Pusa Collection, Division of Entomology, Indian Agricultural Research Institute, New Delhi, India (NPC). Specimens were processed following Supare *et al.* (1990) and Li Ren *et al.* (2013) with slight modifications. The terminology is after Supare *et al.* (1990), Thompson (1992), Poorani and Ramamurthy (1997) and Wanat (2007). Dissections were done in a Leica EZ4 stereozoom microscope after relaxing overnight, and the dissected parts were placed in 10%-30% KOH for 60 minutes for digestion of soft tissues. These were cleaned, and stored in glycerol in microvials after study, and pinned onto the respective specimens. Illustrations were drawn using a drawing tube attached to a Leica DM500 research microscope, Leica MZ16A

stereozoom microscope. Photographs were taken with Leica DFC425C digital camera attached with Leica M205FA stereozoom microscope with automontage and edited in Adobe Photoshop 7.0. Scanning Electron Microscopy (SEM) was done on Zeiss EVO MA10 after 24nm thick palladium coating in a SC7620 sputter coater at  $6 \times 10^{-2}$  mbar; images were taken at 20 kV EHT and 10Pa, between 100x and 1.75 kx. Measurements were made using an ocular micrometer, with standard length= from the apex of head to base of elytra; head length= dorsally from the posterior margin of the rostrum to base of head; head width= widest part of head; frons length= distance between the eyes; pronotal length= dorsally from the anterior margin on the midline to the base of pronotum; pronotal width= widest part of pronotum; elytral length= dorsally along the suture of the elytra from apex to base; elytral width= widest part of the elytra; rostral length= straight line from apex to the anterior margin of the eye; rostral width= widest part of rostrum; scape length; segments length and width; club length= from apex to base and club width= widest part of club. Abbreviations: SL- Standard length; SW- Standard width; PL- Pronotal length; PW- Pronotal width; EL- Elytral length; EW- Elytral width; RL- Rostrum length; RW- Rostrum width; EYL- Eye length; EYW- Eye width; CL- Club length; CW- Club width.

### RESULTS AND DISCUSSION

#### A. The genus *Hemerus* Marshall (Figs. 1-20)

*Hemerus* Marshall, 1944: 458. Type species *Hemerus virens* Marshall; Alonso Zarazaga and Lyal, 1999: 152

\*Corresponding author

## Description

Body length 5.70- 6.20 mm. Head with the frons on a level with the upper margin of the eyes, its width 1.3x as the length of an eye, eyes nearly rounded, convex. Rostrum transverse, 0.83x as wide as base of head, the lower surface short and not parallel with the upper surface (Fig. 1); dorsolateral carinae diverging towards apex, parallel in basal half; epistome with its carinate margin forming a sharp acute angle that extends behind the antennae; posterior margin without such obliquely curved carinae behind scrobes; interscrobial area not raised as a plate; curving outwards at apex, without a transverse carina behind the epistome; lateral areas with no oblique carina; and mentum with two setae (Fig. 7). Antennae with the scape slender, cylindrical, gradually widening apically, with recumbent setae; funicle segment 1 1.38x as long as 2. Pronotum transverse, trapezoidal, 1.25x wider at base than at apex, the base deeply bisinuate, median lobe rounded and its angles acute and extending to stria 6 on the elytra, and without any postocular lobes. Elytra with narrow sloping shoulders, jointly rounded at apex, and wings functional. Legs with a very small femoral tooth; front tibiae not sinuate at base; and tibial apex of hind pair open.

## Comments

Mentum with 2 setae; interscrobial area of rostrum not raised as a plate; wings functional; funicle with segment 1 4.5x longer than broad; and tibial apex of hind tibiae open are its few diagnostic characters.

### **B. *Hemerus virens* Marshall (Figs. 1-20)**

*Hemerus virens* Marshall, 1944: 459

## Redescription

Integument reddish brown, with uniform, dense, pale green scaling above (Fig. 1); under surface with a broad, median stripe of brown scales down the middle and green scales laterally; antennae reddish brown with pale green setae (Fig. 1); rostrum densely covered with bluish green scales and short subrecumbent pale setae, lateral areas covered with sparse blue and green scales and pale green setae (Figs. 1, 3); surface of pronotum, with median bluish and green scales, with small punctations each with a short, subrecumbent pale green setae; elytra with uniform pale green scaling with a stripe of brown scales; legs brown, with coxae covered with brownish scales and pale setae, with a few bluish green scales near apices, each tooth covered with bluish green scales and short recumbent setae; venter with sternites covered with green scales with a

continuous broad stripe of brownish scales in middle, punctate and each punctation with a pale seta.

Head parallel on both sides, with pale green scales; frons piceous, flat, 1.46x as broad as length of rostrum, and 0.90x as broad as base of rostrum, width of frons 1.95x as length of eye; eyes nearly rounded, convex, laterally oval, without any circumocular sulcus, its width 0.75x length of an eye (Figs. 1, 3, 10, 11).

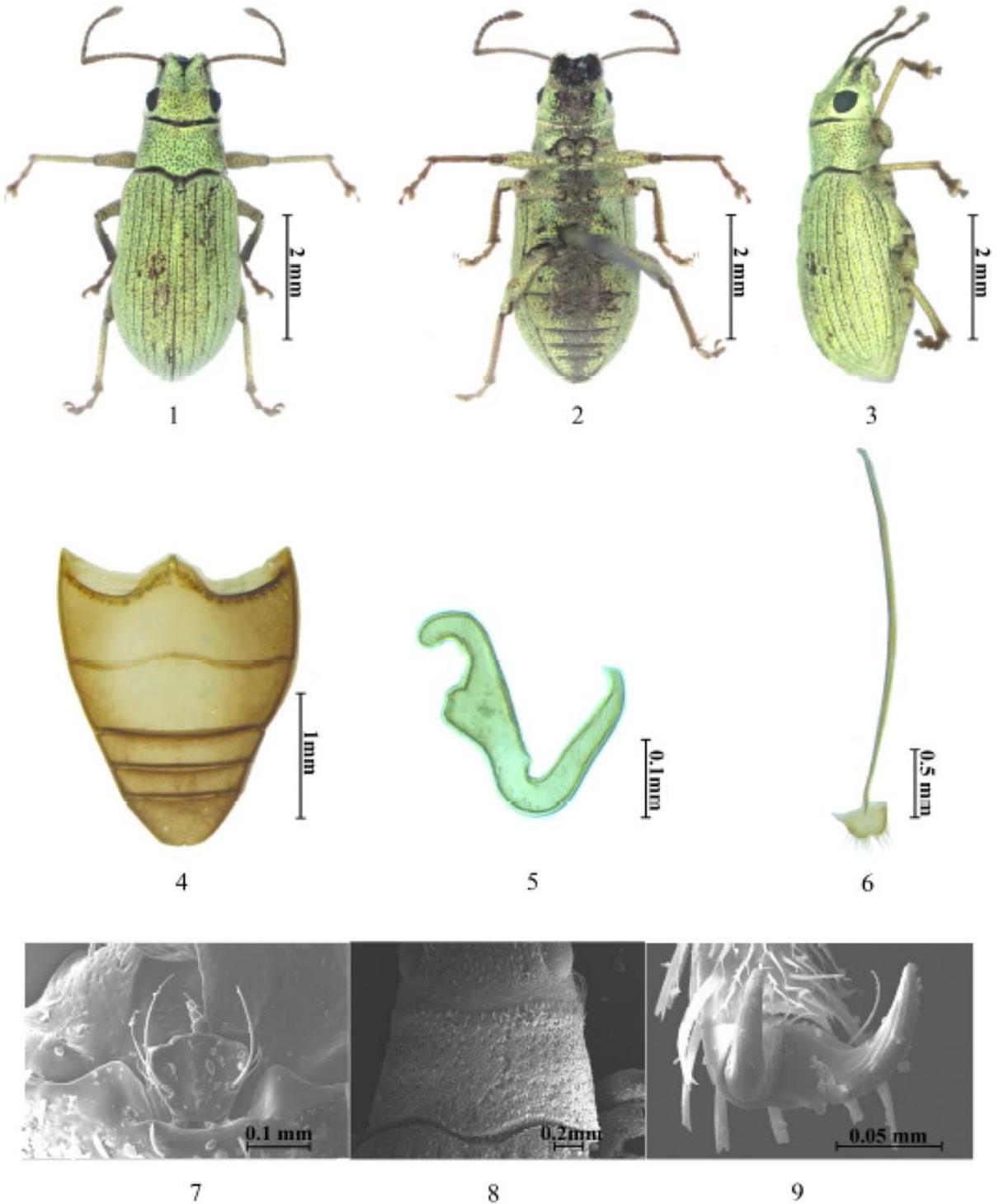
Rostrum in dorsal 1.67x as wide as long, widest at base, width 1.13x as that of frons, 1.07x as long as and 0.83x as wide as head; piceous, dorsal area broadly impressed, with a fine, central carina running throughout its length; lateral areas obliquely and longitudinally striolate, epistome with its carinate margin forming a sharp acute angle that extends behind the antennae (Fig. 10); scrobes narrow, curving towards and open behind, almost visible from above; and mentum with two setae (Figs. 1, 3, 7, 10, 11).

Antenna with scape curved, cylindrical, slender, gradually clavate, reaching middle of pronotum, covered with greenish, recumbent setae; segment 1 1.38x as long as 2; 3.0x as long as 3-7; segment 2 2.16x as long as 3-7; segments 3-7 subequal; segment 1 1.33x as wide as 2-6; all joints covered with green recumbent scales and whorls of pale green suberect setae; club fusiform, finely and uniformly pubescent, 3.0x as long as broad; segment 1 0.83x as long as 2 and 3, segment 2 and 3 subequal in length; club 4.80x as long as segment 1, and 4.00x as long as segment 2 and 3 (Figs. 1, 12).

Pronotum 1.81x as wide as long, piceous, trapezoidal, much wider at base than at apex, with a shallow, transverse impression before middle on each side, anterior margin sinuate in middle, without ocular lobes but with long vibrissae laterally, surface flattened with small punctations, slightly flattened in the middle of the disk, lateral sides shallowly constricted in its apical 1/3<sup>rd</sup> and then widening behind, basal margin deeply bisinuate, with its median lobe rounded, its lateral angles acute and each extending to stria 6 of elytra (Figs. 1, 13).

Scutellum visible, piceous, rectangular with anterior margin rounded, completely covered with bluish green scales, and 1.11x as long as wide (Figs. 1, 14).

Elytra widening behind middle, 3.21x as long as wide, 5.30x as long as apex, 1.64x as wide as apex, narrowing towards apex, with apices jointly rounded, steeply declivous at apical 1/4<sup>th</sup>, slightly smaller than



Figs. 1-9 *Hemerus virens* (Marshall) Habitus: 1-3. Dorsal, ventral and lateral view; 4. Venter; Female genitalia, 5-6. spermatheca and spiculum ventrale; 7. Mentum with two setae; 8. Pronotum; 9. Claw.

base of pronotum, with shoulders narrow and sloping; striae very narrow, with strial punctations shallow and each punctation with a fine, subrecumbent seta; intervals almost flat, uniformly studded with bluish green scales, each interval with numerous spatulate pale setae (Figs. 1, 14). Elytral vestiture of three types, scales predominantly flat, subcircular to ovate, with granulated impression on surface; setae of two types, either narrowly elongate, curved, with irregular impression on surface, or broadly elongate with indistinct grooves on surface (Figs. 19, 20).

Venter with surface of ventrite 1 strongly convex at middle, and ventrite 2 slightly convex at middle, ventrite 3-5 almost parallel horizontally, ventrite 1 1.23x as long as 2, 1.68x as long as 3 and 4 combined, and 2.0x as long as 5; ventrite 2 1.36x as long as 3 and 4 combined and 1.63x as long as 5; both ventrites 3 and 4 subequal in length; ventrite 5 0.84x as long as 3 and 4 combined; ventrite 5 broadly convex; fore coxae present in middle of the prosternum, hind coxae apart by width of median coxae, and hind coxae just reaching the margin of the elytra; venter with the intercoxal processes narrower than coxae and rounded in front (Figs. 4, 15).

Leg with femora clavate, with small tooth, fore tibiae not sinuate at base, tibial apex of hind pair open (Fig. 16), apical end of each tibia with a fringe of pale bristles, with mucrotibial apex of hind tibiae open; tarsi densely setose; hind tarsus with first segment 1.5x as long as second, third tarsi bilobed, claws free and simple (Figs. 2, 16).

Female genitalia having spermatheca with proximal arm 1.5x as long as distal arm, proximal arm swollen at ramus; nodulus distinct; cornu straight and pointed at apex, both cornu and ramus lying parallel to each other (Figs. 5 and 17); Spiculum ventrale with shaft elongate, 5.90x as long as basal plate, apex not clubbed, basal plate 1.20x as broad as long, subcircular, and its apex with long setae slightly depressed at middle apex (Figs. 6 and 18).

**Measurements (in mm):** SL- 5.45 ( $5.9 \pm 0.12$ ); SW- 2.10 ( $2.26 \pm 0.044$ ); PL-0.90 ( $0.85 \pm 0.063$ ); PW- 1.60 ( $1.66 \pm 0.10$ ); EL- 3.60 ( $3.66 \pm 0.10$ ); EW- 1.10 ( $1.15 \pm 0.034$ ); RL- 0.60 ( $0.64 \pm 0.072$ ); RW- 1.0 ( $1.04 \pm 0.072$ ); EYL- 0.53 ( $0.455 \pm 0.0022$ ); EYW- 0.40 ( $0.36 \pm 0.062$ ); CL- 0.50 ( $0.54 \pm 0.037$ ); CW- 0.15 ( $0.165 \pm 0.011$ ).

Variation. SL-  $5.82 \pm 0.37$  (5.45-6.20); SW- 2.20

$\pm 0.10$  (2.10-2.30); PL- $0.85 \pm 0.05$  (0.80-0.90); PW-  $1.55 \pm 0.05$  (1.50-1.60); EL- $3.37 \pm 0.075$  (3.30-3.45); EW- $1.05 \pm 0.05$  (1.00-1.10), RL- $0.65 \pm 0.05$  (0.60-0.70); RW- $1.05 \pm 0.05$  (1.0-1.10); HL- $0.57 \pm 0.025$  (0.55-0.60); HW- $1.25 \pm 0.05$  (1.20-1.30); CL- $0.50 \pm 0.025$  (0.48-0.53); CW- $0.165 \pm 0.015$  (0.15-0.18); EYL- $0.45 \pm 0.05$  (0.40-0.50); EYW- $0.35 \pm 0.05$  (0.30-0.40).

**Specimens examined:** 2♀♀, INDIA: Punjab: Chandigarh, Sukhna Lake, 23.vii.1976, M. Haq, Talhi; 3♀♀, INDIA: Punjab: Chandigarh, 13.viii.1977, M. Haq, Grass; 4♀♀, INDIA: Punjab: Chandigarh, 1.viii.1978, M. Haq, Dalbergia; 1♀, INDIA: Punjab: Chandigarh, Botanical Garden, 1.viii.1978, M. Haq, Talhi; 2♀, INDIA: Punjab: Chandigarh, 18.vii.1984, M. Haq, Light; 1♀, INDIA: Punjab: Sangarwala, 24.vii.1984, M. Haq, Eucalyptus; 2♀♀, INDIA: Punjab: Sangarwala, 24.vii.1984, M. Haq, Peach; 1♀, INDIA: Punjab: Chandigarh, Sukhna Lake, 25.vii.1984, M. Haq, Mango (NPC).

### Comments

Pronotum trapezoidal, much wider at base than at apex, the basal margin deeply bisinuate; its angles acute and extending to stria 6 on the elytra; and funicle with segment 2 0.70x as short as 1 are some of its important characters.

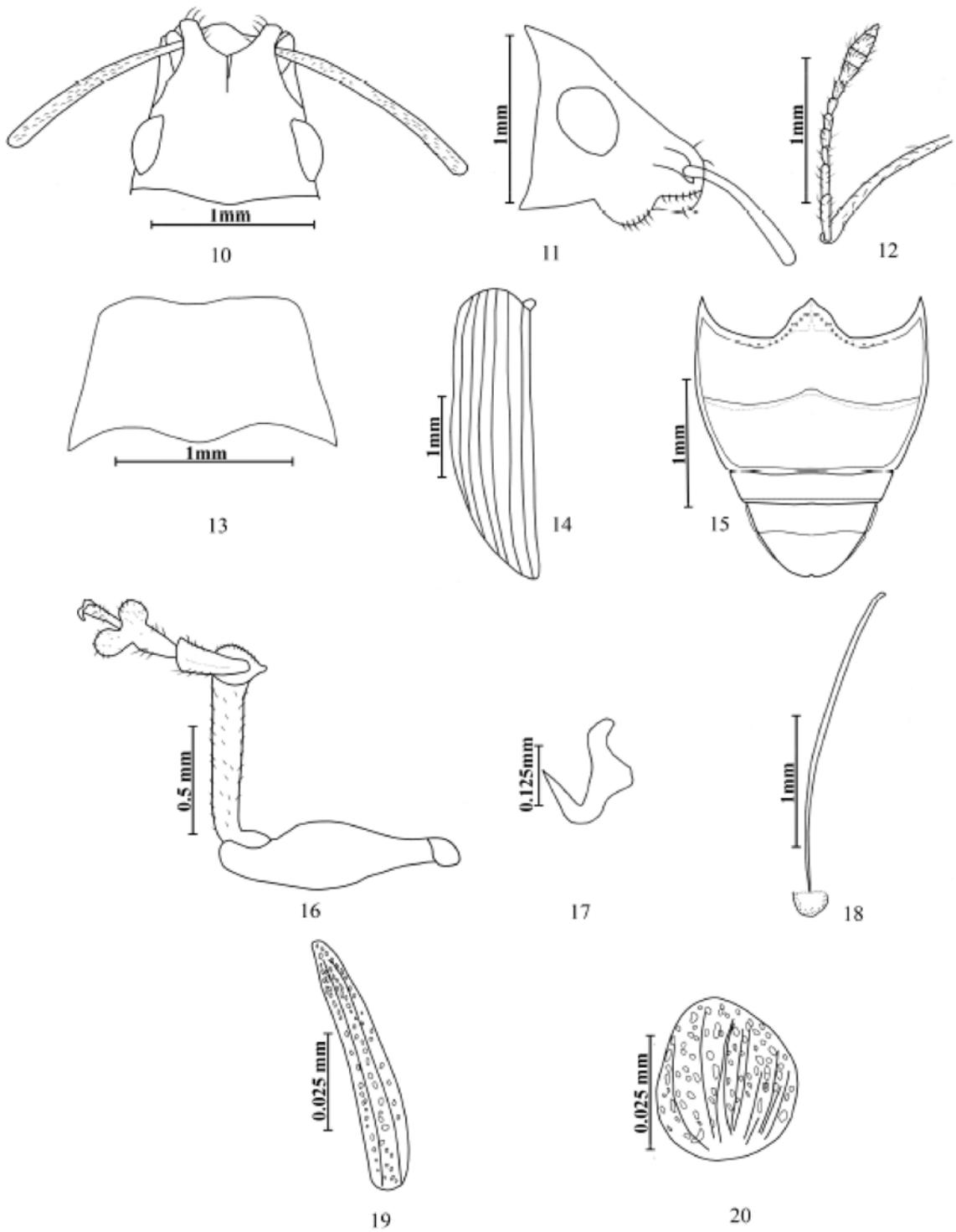
Redescription herein adds following observations: scutellum subcircular; venter with surface of ventrite 1 strongly convex at middle, ventrite 2 1.36x as long as 3 and 4 combined, both ventrite 3 and 4 subequal in length, ventrite 5 broadly convex, and these are not mentioned by Marshall (1944) and Pajni (1990).

### ACKNOWLEDGEMENTS

This study is funded by All India Coordinated Project on Taxonomy "AICOPTAX- Coleoptera", Ministry of Environment, Forests and Climate Change (MoEF), New Delhi, India. We thank Mr. Mahesh Rawat, Division of Entomology, IARI, New Delhi for photoshop work.

### REFERENCES

- Alonso- Zarazaga, M.A. and Lyal, C.H.C. 1999. A World catalogue of families and genera of Curculionoidea (Insecta: Coleoptera) (excepting Scolytidae and Platypodidae) *Entomopraxis* S.C.P., Barcelona, 315 p.
- Lacordaire, T. 1863. Histoire naturelle des insectes. Genera des Coleopteres ou expose methodique et critique de tousles genres



Figs. 10-20. *Hemerus virens* (Marshall). 10-11. Head, dorsal and lateral view, 12. antenna, 13. pronotum, 14. elytra, 15. venter, 16. foreleg; Female genitalia, 17-18. spermatheca and spiculum ventrale; Elytral vestiture; 19. setae; 20. scales.

- proposes jusqu'ici dans cet ordre d'insectes. Vol. 6. Roret, Paris, 637 p.
- Li Ren., Alonso-Zarazaga, M.A. and Runzhi, Z. 2013. Revision of the Chinese *Geotragus* Schoenherr with description of three new species (Coleoptera: Curculionidae: Entiminae) *Zootaxa*, 3619(2): 161-182.
- Marshall, G.A.K. 1944. On the genera of the tribe Cyphicerini (Col. Curc.), *Annals and Magazine of Natural History, London*, 11(11): 433-462.
- Pajni, H.R. 1990. Fauna of India and adjacent countries. Coleoptera: Curculionidae, Subfamily Eremninae Tribe Cyphicerini. *Zoological Survey of India. The Technical and General Press, Calcutta, India*, 490-492 p.
- Poorani, J. and Ramamurthy, V. V. 1997. Weevils of the genus *Lepropus* Schoenherr from the Oriental region (Coleoptera: Curculionidae: Entiminae), *Oriental Insects*. 31(1): 1-81.
- Schoenherr, C.J. 1845. Genera et species curculionidum, cum synonymia hujus familiae. Species novae aut hactenus minus cognitae, descriptionibus a Dom. L. Gyllenhal, C. H. Boheman, O. J. Fahraeus, et entomologis aliis illustratae. Tomus octavus - Pars secunda. Supplementum continens Parisiis: Roret; Lipsiae: Fleischer, 504 p.
- Supare, N. R., Ghai, S. and Ramamurthy, V. V. 1990. A revision of *Tanymecus* from India and adjacent countries (Coleoptera: Curculionidae). *Oriental Insects*. 24: 1-126.
- Thompson, R. T. 1992. Observations on the morphology and classification of weevils (Coleoptera: Curculionidae) with a key to major groups. *Journal of Natural History*. 26(4): 835-891.
- Wanat, M. 2007. Alignment and homology of male terminalia in Curculionoidea and other Coleoptera. *Invertebrate Systematics*. 21(2): 147-171.

(Manuscript Received: May 2014)