

A new genus (Orthoptera Acrididae Acridinae) and three species of short-horned grasshoppers from India

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ABSTRACT

A new genus *Keshava* n. gen. (Orthoptera) of the subfamily Acridinae (type species *Keshava shishodensis* n. sp.) with three new species are described from Chhattisgarh, India. Taxonomical notes are provided.

KEY WORDS

Taxonomy; Keshavpur; Acridoidea; new genus; new species.

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INTRODUCTION

The subfamily name Acridinae (Orthoptera) was first used by Krauss (1890) but priority for family - group names based on *Acrida* dates from Acridina Macleay, 1821 (Eades et al., 2017).

Presently, the subfamily Acridinae is represented by 140 genera globally (Eades et al., 2017), of which 15 genera and 36 species reported by Shishodia et al. (2010) from India. Recently, Kumar & Usmani (2015) described a new genus *Mesophlaeoba* Kumar et Usmani, 2015 with the type species *M. usmanii* Kumar et Usmani, 2015 from Himachal Pradesh, India.

The subfamily Acridinae is characterized by head of variable shape, prosternal process usually absent, wings often present, intercalary vein of medial area of elytron usually present, tympanal normally present; posterior margin of female subgenital plate entirely setose.

The present paper deals with the description of a new genus of this subfamily with three new species from India; additional taxonomical notes are provided.

MATERIAL & METHODS

Study area

The survey was carried out in Durg district of Chhattisgarh state and two protected areas i.e. Barnawapara Wildlife Sanctuary and Udanti Wildlife Sanctuary (Fig. 1). The Durg district is situated south-eastern part of the state and lies between latitude 20°54'N to 21°32'N and longitude 81°10'E to 81°36'E, covering an area of about 8549 sq. kms. Barnawapara Wildlife Sanctuary, Raipur district of Chhattisgarh is located between latitudes 21°18'45" to 21°30'N and longitudes 88°22'30" to 82°37'30"E, with an area of about 244.66 sq. km. Udanti Wildlife Sanctuary is located in the south-western part of earlier Raipur district which is now furcated into Gariyaband district. The area of the Udanti Wildlife Sanctuary is about 247.80 sq. km.

Sampling

The specimens were preserved and pinned. The figures were captured using Nikon D 300S with 105

macro lens. The specimens were studied under Leica stereo-zoom Microscope (Leica M205 A). All the measurements are given in millimeters. The type specimens are deposited in the Central Entomological Laboratory (CEL) of the Zoological Survey of India, Kolkata.

RESULTS

Systematics

Ordo ORTHOPTERA Olivier, 1789
 Subordo CAELIFERA Ander, 1939
 Superfamilia ACRIDOIDEA Macleay, 1821
 Familia ACRIDIDAE Macleay, 1821
 Subfamilia ACRIDINAE Macleay, 1821
 Tribe ACRIDINI Macleay, 1821
 Genus *Keshava* gen. nov.
 Type species: *Keshava shishodensis* n. sp.

Keshava n. gen.

DIAGNOSIS OF NEW GENUS. Size medium. Antenna subfiliform, fastigium of vertex concave, without median carina, lateral carinae elevated; Disc of pronotum punctuate with two transverse sulci, median carinae and lateral carinae distinct or indistinct, anterior margin of pronotum straight and posterior margin rounded or obtuse angulate. Cerci cylinder, ovipositor valve short and stout.

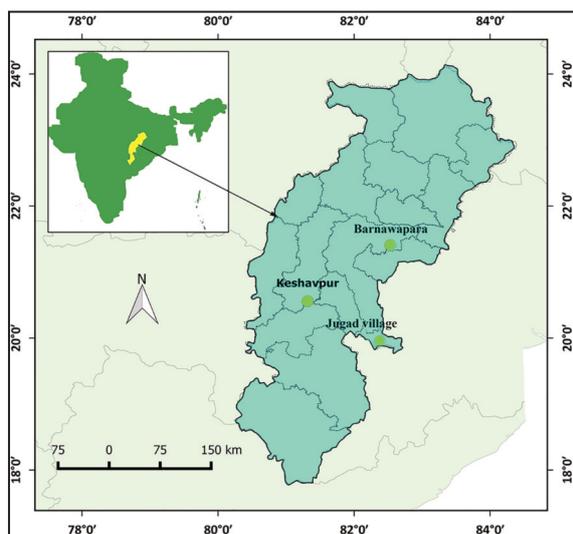


Figure 1. Collection localities in Chhattisgarh, India.

ETYMOLOGY. The name of the genus has been given after the collection locality.

REMARKS. *Keshava* n. gen. differs from the other genera of the subfamily Acridinae i.e. *Acrida* Linnaeus, 1758 and *Truxalis* Fabricius, 1775 from elongated head and hind legs. The new genus differs from the other known genera *Phlaeobida* Bolivar, 1902, *Paraphlaeoba* Bolivar, 1902, *Carliola* Uvarov, 1939, *Paradontomelus* Ramme, 1929, *Odontomelus* Bolivar, 1890 and *Zygophlaeoba* Bolivar, 1902 by the presence of fully developed tegmina which is short or rudimentary in all the above genera. *Pasiphinus* Bolivar, 1914 differs from new genus by the presence of longitudinal ridge on head and pronotum together. The genera viz. *Sikkimiana* Uvarov, 1940, *Gymnobothrus* Bolivar, 1889, *Julea* Bolivar, 1914 and *Duroniopsis* Bolivar, 1914 are different from new genus by the presence of curved lateral carinae of pronotum in prozona. Lateral carinae of pronotum diverging in metazona in genera viz. *Phlaeobacris* Williamse, 1932, *Holoperca* Karsch, 1891 and *Orthchtha* Karsch, 1891 make them different from new genus. *Pyrgophlaeoba* Miller, 1929 and *Bababuddinina* Bolivar, 1918 differ from new genus by the irregular lateral carinae of pronotum. Genus *Neophlaeoba* Usmani et Shafee, 1983 differs from new genus by presence of fastigial foveolae. Genus *Mesophlaeoba* Usmani et Kumar, 2015 differs by presence of filiform antennae and hind tibiae with dark pale colour.

For others data see Linnaeus, 1758; Fabricius, 1775; Bolivar, 1889, 1890, 1902, 1914, 1918; Krauss, 1890; Karsch, 1891; Macleay, 1821; Miller, 1929; Ramme, 1929; Willemsen C., 1932; Uvarov, 1939, 1940; Usmani & Shafee, 1983.

Keshava shishodensis n. sp. (Figs. 2–9)

EXAMINED MATERIAL. Holotype female DC, Chhattisgarh, Durg, Keshavpur, 06.II.2014, 20°33'25.3"N, 81°18'59.4"E, 400 m, coll. S.K. Gupta, Reg. no. 18834/H5.

Paratype: 12 females DC, same locality as holotype data, Reg. no. 18835/H5-18846/H5.

DESCRIPTION OF THE HOLOTYPE. Female. Body size medium, head broad, obtuse, anterior margin in profile slightly concave, shorter than pronotum in dorsal view. Fastigium of vertex slightly concave, lateral carinae elevated, median carina indis-

tinct. Foveolae invisible. Frontal ridge subparallel, coarsely punctured, below broad. Eyes oval, about 1.8 times as long as wide; located near anterior part of fastigium of vertex. Pronotum 1.5 times as long as wide; pronotal disc, rugose, punctured without complete transverse sulci. Median carinae slightly developed in metazona. Lateral carinae absent. Metazona 1.3 times longer than prozona. Mesosternal lobe 1.6 times wider than long. Wings: tegmina and hind wing well developed, exceeding upto hind knee of hind femora, apex obtuse. Abdomen 2.2 times longer than its width; Cerci cylindrical, 2 times longer than wide, tip rounded, shorter than epiproct. Ovipositor: Valvula short, end slightly hook shaped, Lower valvula shorter than upper one. Ovipositor dorsal valve stout rather ventral valve short. Fore leg with short white hairs; femur 4.6 times as long as wide, femur subequal with tibia. Mid leg with short white hairs; femur 5 times as long as wide, femur 1 time longer than tibia. Hind femora elongated, about 3.8 times as long as wide, reaching end of abdomen. Hind tibiae slender, shorter than hind femur with small white hairs and 10 outer and 9 inner spines. First tarsal segment slightly shorter or subequal to second and third tarsal together. Colour: body light brown. Hind tibiae with a large yellowish hue near apical part.

Measurements (all in millimetres). Body length: 22.232 (from the tip of the vertex to the end of the abdomen), Compound eye length: 1.006, width: 0.544; interocular distance: 0.694; fastigium of vertex length: 0.647; fastigium of vertex width: 0.555; head length 1.709; Pronotum length: 2.206, width: 1.409; prozona length: 0.947, metazona length 1.259, mesosternal lobe length: 0.751, width 0.462; Fore leg: femur length: 1.691, width: 0.361; tibia length: 1.699, width: 0.224; tarsus length (by segments) I: 0.300, II: 0.179, III: 0.496; claw length: 0.300. Mid leg: femur length: 2.141, width: 0.414, tibia length: 2.091, width: 0.221; tarsus length: I: 0.387, II: 0.151, III: 0.490; claw length 0.346. Hind leg: femur length: 6.19, width: 1.608, tibia length: 5.802, width: 0.301, tarsus length: I: 0.754, II: 0.207, III: 0.658, claw length 0.786. Abdomen length: 6.237; width: 2.568. cerci length 0.657, width 0.312, dorsal ovipositor valve length: 1.096; ventral Ovipositor valve length: 1.039.

VARIABILITY. The paratypes have no substantial morphological differences with the holotype described. Length of body 22 mm.

ETYMOLOGY. This species is named in honour of a renowned Indian Orthopteran taxonomist, Dr. M. S. Shishodia, Retd. Scientist, Zoological Survey of India.

***Keshava barnawaparensis* n. sp.** (Figs. 10–17)

EXAMINED MATERIAL. Holotype, female, Chhattisgarh, Barnawapara Wildlife Sanctuary, Barnawapara, 07.VII.2011, 21°24'002"N, 82° 25' 313"E, altitude 301 m, coll. S.K. Gupta, Reg. no. 18847/H5.

Paratype: 8 females, Same data as holotype, 18848/H5- 18855/H5.

DESCRIPTION OF THE HOLOTYPE. Female. Body medium sized, cylindrical, antennae slightly flattened basally, 22 segmented, longer than head and pronotum together; head subconical, shorter than pronotum; eyes oval in shape; maximum diameter of eye slightly longer than the interocular distance; frons oblique; fastigium of vertex angulate; slightly produced in front of eyes, median carina of vertex interrupted, lateral carina elevated, apex obtusely rounded; face oblique in profile view, frontal ridge narrow deeply sulcate below, lateral carinulae diverging downwards. Pronotum 1.6 times as long as wide, disc with two transverse sulci interrupted with median carina, with well developed lateral carinae and median carinae in metazona distinct and in prozona obliterated; surface of pronotum usually punctuate, anterior margin of pronotum straight and posterior margin curved; prozona 1.3 times longer than metazona; posterior margin of metazona rounded. Prosternal process absent. Mesosternal lobe 1.3 times shorter than its width. Mesosternal interspace open. Tegmina: tegmina and hind wing well developed, reaching upto tip of hind knee; hind wings slightly shorter than tegmina. Legs: hind femora short and compressed laterally, upper and lower carina smooth, reaching upto the tip of abdomen; hind tibiae slender with outer 11 and inner 10 small spines at dorsal margin. First tarsal segment 2.1 times longer than second tarsal segment and also slightly longer than third tarsal segment. Abdomen 4.8 times longer than its width; Cerci cylindrical, 1.7 times longer than wide, tip rounded, shorter than epiproct. Ovipositor: valvula short, end slightly hook shaped, lower valvula shorter than upper one. Ovi-

positor dorsal valve stout rather ventral valve short. Colour: body light brown. Pronotum lateral view with a dark blackish brown stripe both side. Tibiae with upper part yellow and after all part dark blackish. Hind tibial spines yellowish with tip dark blackish.

Measurements (all in millimetres). Body length (from the tip of the vertex to the end of the abdomen): 23.413. Antenna length: 5.799, compound eye length: 1.314, width: 0.821; interocular distance 0.843; fastigium of vertex length 0.621; width: Head length 2.307; Pronotum length: 3.107, width: 1.838; prozona length: 1.790, metazona length 1.305, mesosternal lobe length: 1.601, width 1.205; Fore leg: femur length: 3.506, width: 0.663; tibia length: 2.609, width: 0.466; tarsus length (by segments) I: 0.525, II: 0.350, III: 1.079; claw length: 0.580. Mid leg: femur length: 4.643, width: 0.797, tibia length: 3.978, width: 0.359; tarsus length: I: 0.565, II: 0.337, III: 0.994; claw length 0.563. Hind leg: femur length: 12.984, width: 3.663, tibia length: 11.732, width: 0.404, tarsus length: I: 1.433, II: 0.655, III: 1.100. Wings: tegmina length: 19.256, wings length 2.796; Abdomen length: 6.920; width: 1.432. cerci length 0.663, width 0.384. Dorsal ovipositor valve length: 2.920; ventral Ovipositor valve length: 1.800.

VARIABILITY. The paratypes have no substantial morphological differences with the holotype described. Length of body 23 mm

ETYMOLOGY. This species is named after the collection locality.

Keshava jugadensis n. sp. (Figs. 18–24)

EXAMINED MATERIAL. Holotype female, Chhat-tisgarh, Gariyaband, Jugad, 29.VI.2014, 20° 08'42.9"N, 82°16'34.3"E altitude 438 m, coll. S.K. Gupta and collaborators, Reg.no. 18856/H5.

Paratype: 5 females, same data as holotype, 18857/H5-18861/H5.

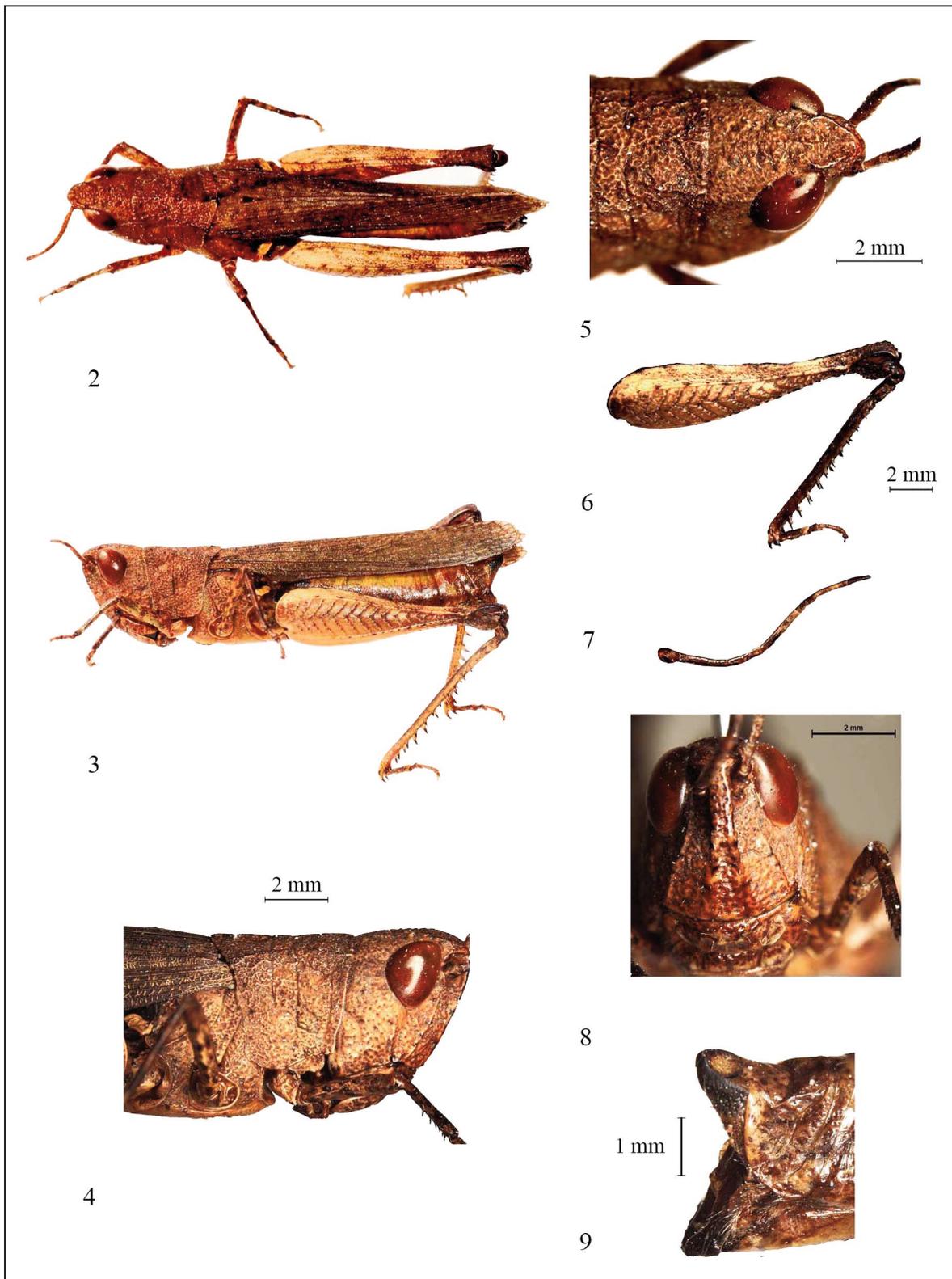
DESCRIPTION OF THE HOLOTYPE. Female. Body medium sized, cylindrical; head small, eyes ovoid in shape; maximum diameter of eye slightly longer than the interocular distance; frons oblique; fastigium of vertex angulate, concave, lateral carinae elevated; median carina indistinct. Pronotum 1.6 times as long as wide, disc with two transverse sulci

interrupted with median carina, with weak lateral carinae, straight only metazona and prozona lateral carinae obliterated; metazona with dark blackish stripe; surface of pronotum usually punctuate, anterior margin of pronotum straight and posterior margin rounded; posterior margin of metazona rounded. Prosternal process absent. Mesosternal lobe 1.8 times shorter than its width. Mesosternal interspace open. Wings: tegmina and hind wing well developed, slightly surpassing tip of hind knee; hind wings slightly shorter than tegmina. Abdomen 3.3 times longer than its width; cerci cylindrical, 1.8 times longer than wide, tip rounded, shorter than epiproct. Ovipositor: valvula short, end slightly hook shaped, lower valvula shorter than upper one. Ovipositor dorsal valve stout rather ventral valve short. Legs: hind femora slender 3.8 times longer than wide; slightly shorter than abdomen; upper and lower carina smooth, upper apical lobe longer than lower, inner margin of inner side without a row of stridulatory pegs; hind tibiae with outer 9 and inner 11 small spines at dorsal margin. Colour: body light brown. Pronotum disc with a dark blackish brown stripe.

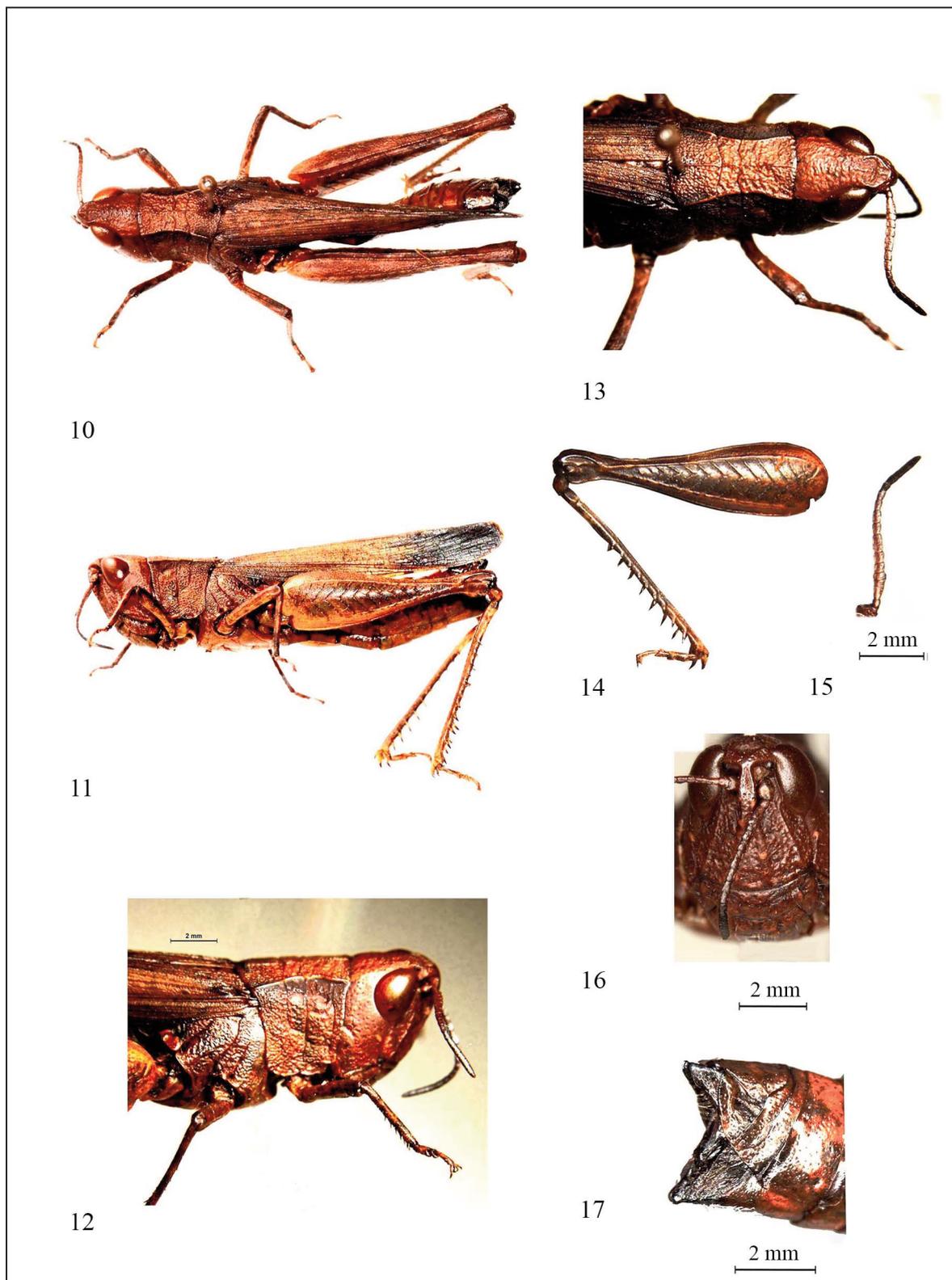
Measurements (all in millimetres). Body length (from the tip of the vertex to the end of the abdomen): 25.957. Compound eye length: 1.994, width: 1.225; interocular distance 1.354; fastigium of vertex length 1.077; Pronotum length: 4.583, width: 2.728; prozona length: 2.681, metazona length 1.902, mesosternal lobe length: 0.915, width 1.714; Fore leg: femur length: 2.962, width: 0.537; tibia length: 3.345, width: 0.359; tarsus length (by segments) I: 0.680, II: 0.237, III: 1.045; claw length: 0.325. Mid leg: femur length: 3.756, width: 0.819, tibia length: 4.080, width: 0.377; tarsus length: I: 0.768, II: 0.192, III: 0.938; claw length 0.407. Hind leg: femur length: 12.380, width: 3.228, tibia length: 10.331, width: 0.382, tarsus length: I: 1.296, II: 0.684, III: 1.212. Wings: tegmina length: 18.532. Abdomen length: 12.746; width: 3.206. Cerci length 0.743, width 0.412. Dorsal ovipositor valve length: 3.910; ventral Ovipositor valve length: 2.532.

VARIABILITY. The paratypes have no substantial morphological differences with the holotype described. Length of body 26. mm

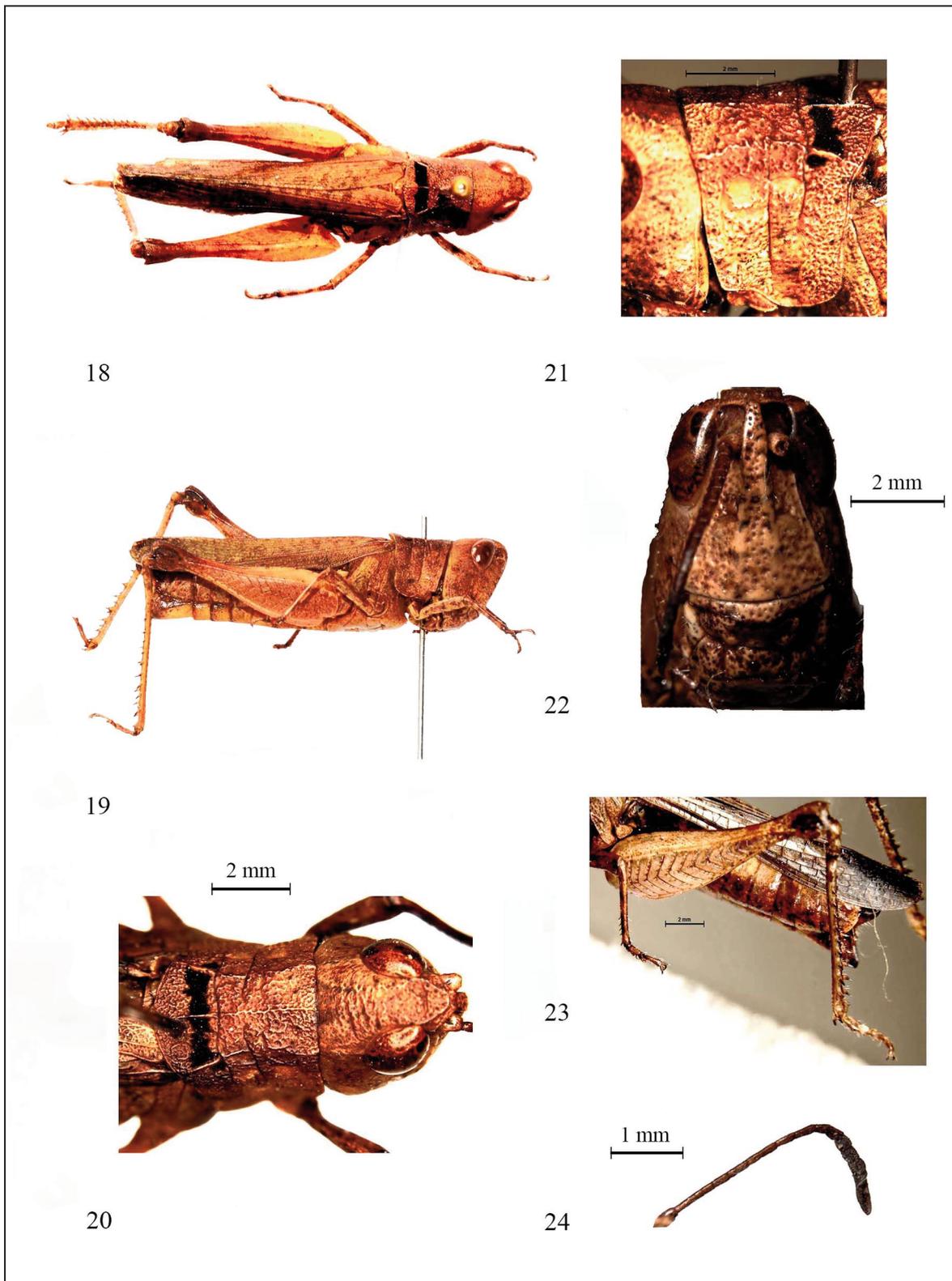
ETYMOLOGY. This species is named after the collection locality.



Figures 2–9. *Keshava shishodensis* n. sp. female. Fig. 2: dorsal view; Fig. 3: lateral view; Fig. 4: pronotum lateral view; Fig. 5: fastigium of vertex; Fig. 6: hind femur; Fig. 7: antenna; Fig. 8: frontal ridge; Fig. 9: ovipositor.



Figures 10–17. *Keshava barnawaparensis* n. sp., female. Fig. 10: dorsal view; Fig. 11: lateral view; Fig. 12: pronotum lateral view; Fig. 13: fastigium of vertex; Fig. 14: hind femur; Fig. 15: antenna; Fig. 16: frontal ridge; Fig. 17: ovipositor.



Figures 18–24. *Keshava jugadensis* n. sp., female. Fig. 18: dorsal view; Fig. 19: lateral view; Fig. 20: pronotum dorsum view and fastigium of vertex; Fig. 21: pronotum lateral view; Fig. 22: frontal ridge; Fig. 23: med leg and hind leg; Fig. 24: antenna.

Keys to the genus

1. Pronotum disc with distinct lateral and median carina.....2
 - Pronotum disc without distinct lateral and median carina.....*Keshava shishodensis* n. sp.
2. Pronotum lateral side below lateral carinae both side with a large black stripe, metazona without colour pattern, median carina in metazona not elevate.....*Keshava barnawaparensis* n. sp.
 - Pronotum lateral side below lateral carinae both side without large black stripe, metazona with dark blackish brown colour pattern, median carina in metazona elevated.....*Keshava jugadensis* n. sp.

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