

First record of *Tarbinskiellus terrificus* (Walker, 1869) (Grylloidea: Gryllidae) from Central India

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Abstract

The paper presents new distributional record of the species *Tarbinskiellus terrificus* (Walker, 1869) from Chhattisgarh, India. The habitus photographs and figure of male genitalia of the species is provided for the first time.

Keywords: Gryllinae, New record, Raipur, Gariaband

Introduction

The family Gryllidae is one of the family of super family Grylloidea. The family Gryllidae commonly known as crickets, body size small to large (1 or 2 to 50 mm-Alexander, 1968) can be easily distinguished from other ensiferan families by following characters: antennae filiform, usually long, ocelli presents or absent, auditory organs situated in the anterior tibiae, male elytra usually with stridulatory organs, jumping hind legs, tarsal formulls 3-3-3, and long tactual cerci bearing clumps of knobbed hairs, ovipositor usually long.

The subfamily Gryllinae Laicharting, 1781 is one of the 13 subfamilies of the family Gryllidae Laicharting, 1781. About 7 tribe and 117 genera are globally known under the subfamily Gryllinae (Eades *et al.*, 2015), of which 29 genera are presently known from India (Shishodia *et al.*, 2010).

Serville, 1839 erected genus *Brachytrupes* for the species *Brachytrupes membranaceus membranaceus*. After this Chopard, 1969 reported *Brachytrupes* genus for the species *B. portentosus* (Lichtenstein, 1796), Tamil Nadu: Coromondal coast (Type), from Bihar, Uttarakhand: Dehradun, West Bengal: Darjeeling, Siliguri; Assam: Kalligunga, Cachar, Sibsagar, Garo hills; Karnataka: Mysore; Tamil Nadu: Chennai; *B. orientalis* (Fabricius, 1775) from India: West Bengal: Kolkata; Assam: Sibsagar, Ledo; Orissa: Balighai; Tamil Nadu: Trichinopoly, Negapatam; Karnataka: Mysore; *B. terrificus* Walker, 1869

from India: Tamil Nadu: Chennai (Type specimen in British Museum).

Later on Gorocho, 1983 erected *Tarbinskiellus* genus and placed all three species in the genus *Tarbinskiellus* Gorocho, 2001 studied *Tarbinskiellus* genus and describe one new species *T. neotropicus* sp. nov. from Brazil and also studied *T. portentosus* (Lichtenstein, 1796) from India: Assam and provide results *T. portentosus* is similar also to *T. terrificus* while *T. portentosus* species differs from strongly reduced ovipositor (a female type series of *T. terrificus* from BMNH is designated as lectotype to fix the application of the name and examined type specimen *Brachytrupes terrificus* and one of Walker series so named *Brachytrupes terrificus* Walker, syntype (det. B.C. Townsend). Till date genus *Tarbinskiellus* have 4 species e.g. *T. neotropicus*, *T. orientalis*, *T. portentosus*, *T. terrificus* are globally known Eades *et al.*, 2015, out of which three species reported from India Shishodia, *et al.*, 2010.

Material and Methods

Study Area

The survey was carried out in Chhattisgarh state, covering two protected areas. Barnawapara wildlife sanctuary is situated in Raipur, covering an area of about 244.66 sq. km., lies between latitudes 21°18'45" to 21°30'N and longitudes 88°22'30" to 82°37'30"E. Udanti wildlife sanctuary, is situated in Gariyaband district of Chhattisgarh state,

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which lies between 20°0'N to 20°15'N, 82°30'E to 82°0'E with an area of about 247.80 sq. km.

The specimens were collected by light trap, using usually white sheet or mulmul cloth, hung between the two trees or pole, with the light placed using mercury bulb with Honda generator, or gas in front of it at night collection at Barnawapara camp near Barnawapara village and Udanti Wildlife Sanctuary near Ganga Jamuna village and killed by keeping in a killing bottle containing benzene vapour in killing jar. The specimens were preserved dry. The genitalia of male specimen was dissected out, in 10% Potassium hydroxide for 2 to 12 hours and then preserved in 90 % alcohol. Live image of specimen was capture by using Nikon D 300S with 105 macro lens. The specimen was studied under Leica stereozoom Microscope (Leica M205 A) and photographs were taken using the software Leica Application Suite (LAS V3.8) and deposited in National Zoological Collections of Zoological Survey of India, Kolkata.

Taxonomy

Tarbinskiellus terrificus (Walker, 1869)

1869. *Brachytrypes terrificus* Walker, *Cat. Derm. Salt. Brit. Mus.*, :10. 2010.

Tarbinskiellus terrificus Shishodia *et al.*, *Rec. zool. Surv. India, Occ. Pap.*, 314: 245.

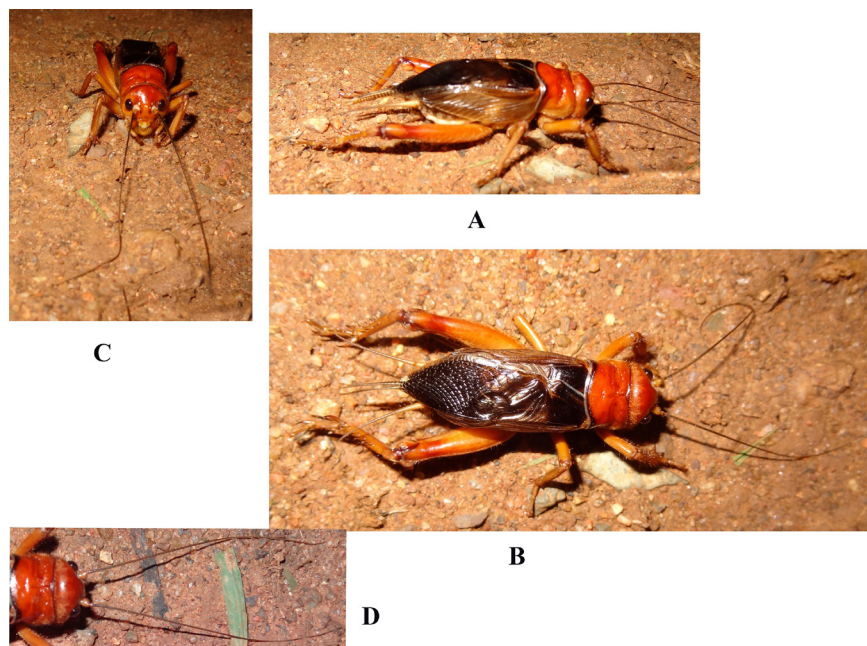
Material examined: Chhattisgarh; Raipur, Barnawapara WLS, Barnawapara Camp, (21°24'000" N, 82°25'312" E), 321 m a.s.l., 14.vi.2012, 1♀,NC, coll. S. K. Gupta & party, Reg. No. 14055/H5; Gariaband; Udanti WLS; Ganga Jamuna Village, (20°17'24.5" N, 82°15'12.2" E), 495m a.s.l., 28.vi.2014 1♂,NC, coll. S. K. Gupta & party, Reg. No. 14056/H5.

Description: Size large Figure (1A, B).

Head: Head as wide as pronotum with dense bristles (Fig 1C). Vertex flat, convex. Eyes large protruding. Ocelli locate in triangle. Median ocelli more than twice as wide as lateral ocelli. Distance between lateralocelli slightly longer than the distance between one lateral and the median ocelli. Maxillary palpi large, joints 1 and 2 subequal; joint 3 the longest, joint 5 slightly short and widened from base.

Pronotum: Pronotum 1.6 times wider than the length in dorsal view (Figure 1D), transverse; anterior margin concave, posterior margin slightly straight and wider than anterior margin; anterior margin with dense bristles, lateral lobe of pronotum ventral margin straight. Mesosternum rectangular; metasternum broader than mesosternum, pentagonal form.

Male Wings: Fore wings covering tip of abdomen (Figure 2E). Stridulatory file complete, more than 41stridulatory teeth (Figure 2H); 1A-4A, first to fourth anal veins; 1A,



Figures 1. A. *T. terrificus* (Walker, 1869) male, lateral view; B. dorsal view; C. Head and antenna (Frontal view); D. Pronotum dorsal view.

slightly bisinuated; posterior cubitus presents; harp crossed by 4, almost transverse veins; mirror rather long, with dividing vein; chords strongly curved; apical area well netted, more than 2 times longer than the mirror area; apical field with 3-9 cell alignments posterior to mirror; Lateral field with 7-13 projections of subcosta. Hind wings long, 1.5 times as long as tegmen.

Legs: Fore legs: Clothed with bristles; femora 2.9 times as long as wide, cylinder, tibiae with a large elongated external tympanum and internal small, ovoid tympanum (Figure 2A). 1 outer apical spur, short, 2 inner apical spurs, of which one long and one some short, wide at base, acute at apex. III tarsal segment slightly longer than first.

slightly subequal. III tarsal segments 1.3 times longer than first.

Hind legs: Femora 3.4 times as long as wide, and 2.4 times longer than the middle femora; basal part dilated; dorsal and ventral margin slightly hairy; dorsal and median external area glabrous; tibiae clothed with bristles but shorter than fore legs, with 5 outer subapical spurs and 4 inner subapical (Figure 2D); except for the 4 apical spurs; outer IInd spurs longest, stout, tip acute and straight, Ist some curved and tip more acute, inner spurs subequal together; basitarsus 1.2 times longer than the combining length of the remaining two apical tarsomeres; furrowed dorsally; with outer margin 3 denticles and inner margin 5 denticles or spines; 2 apical spurs of basitarsus, inner apical basitarsus spur 2.7 times longer than outer basitarsus spur, straight, stout and acut tip (Figure 2F).

Abdomen: Abdomen 1.4 times shorter than the hind femur. Subgenital plate with dense bristles, setose; basal part wide and apically triangulate; 1. 2 shorter than its width acute (Figure 2B). Cerci male 1.4 times longer than the hind femur (Figure 3D). Ovipositor short, straight (Figure 2G).

Male Genitalia: Ectoparamere large. Virga slightly large and stout. Ectoparameres process notch like, tip acute, large (Figure 3C).

Measurements: (all in millimetres).

Male Body length: (from the tip of the vertex to tip of subgenital plate): 40.32. Compound eye length: 2.88, width: 2.15.

Antennal length: 30.56. Antennal socket length :1.47; Scapes length:1.649, Pedicel length: 0.347.

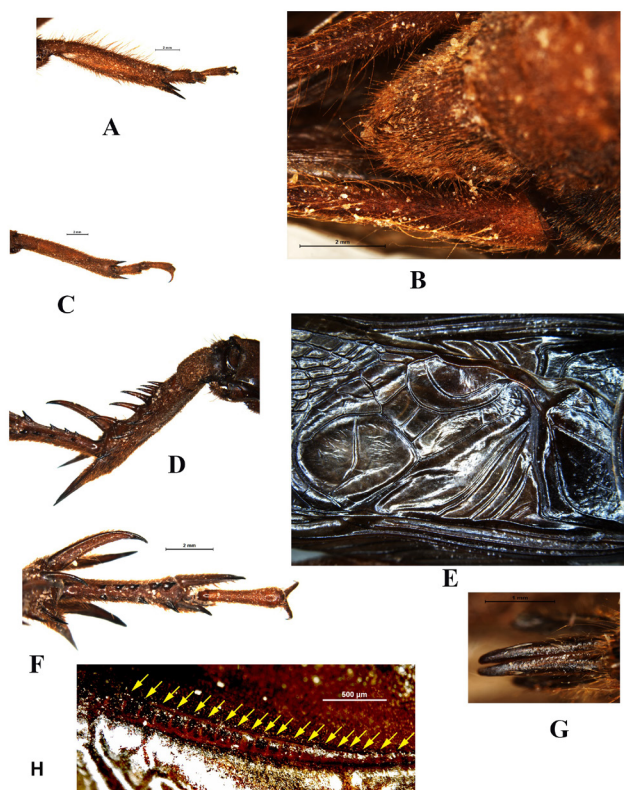
Pronotum length: 7.653, width: 12.667. **Abdomen length:** 16.154.

Fore leg: femur length: 9.198, width: 3.111; tibia length: 10.315, width: 2.356; outer Tympanum length: 1.369; width: 0.532; outer spur length: 1.689; inner spur length: 2.141; tarsus length (by segments) I: 2.036, II: 0.840, III: 2.113; claw length I: 0.976; II: 0.895.

Mid leg: femur length: 9.381, width: 2.219, tibia length: 10.055, width: 1.419; Outer spur length: 1.334; middle spur length: 0.810; inner spur length: 0.949, tarsus length: I: 1.930, II: 0.231, III: 2.520; claw length 1.148.

Hind leg: femur length: 22.976, width: 6.754, tibia length: 13.428, width: 1.336, tarsus length: I: 5.306, II: 0.915, III: 3.222, claw length I: 800, II: 822.

Wings: tegmina length 30.278, width 10.072; Hind wings length 42.224, length between apex of pronotum to apex of alae 1.03.



Figures 2. A. Fore tibiae show tympanum (external view); B. male subgenital plate; C. Mid tibiae (external view); D. hind tibiae (external view); E, tegmina show mirror; F, hind tarsal; G, Female ovipositor (ventral view); H, Stridulatory file.

Mid legs: Clothed with bristles but shorter than fore legs, cylinder; femora 4 times as long as wide, tibiae with 4 apical spurs, outer one spur 1.4 times longer than dorsal and inner spurs (Figure 2 C); dorsal and inner spurs

Subgenital plate: length in ventral aspect length: 2.340, width: 3.060; cerci length: 16.202, width: 1.276.

Female: Body length (Figure 3A,B) (from the tip of the vertex to tip of subgenital plate): 33.228;

Abdomen length: 12.218. subgenital plate in ventral aspect length: 2.479, width: 3.345; ovipositor in ventral aspect

lower valvule length: 1.954.

Colouration: Body colour bright rufous, tegmina dark brown, legs and pronotum bright rufous, fore legs and mid legs with small white dots, hind femur glabrous and bright rufous, hind knee dark chocolate.

Distribution: India: Chhattisgarh, Karnataka and Tamil Nadu.

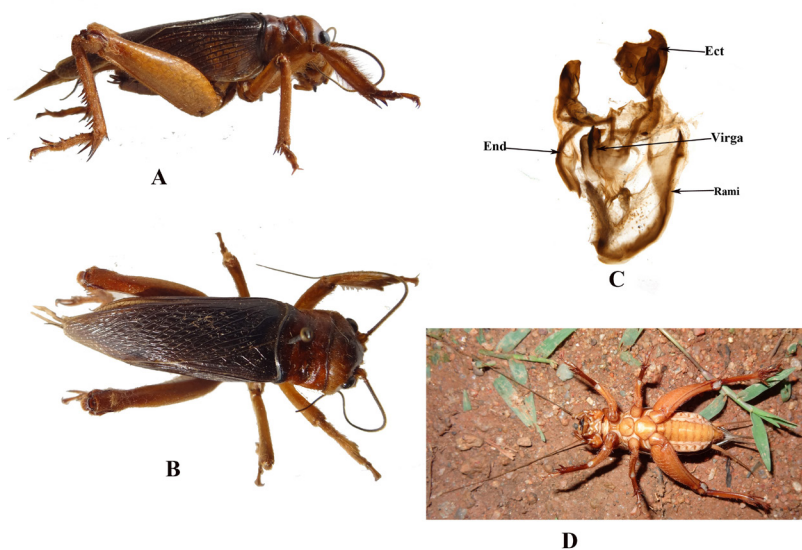


Figure 3. A. *T. terrificus* (Walker, 1869) Female, lateral view; B. dorsal view; C. male genitalia; D. Male live ventral view.

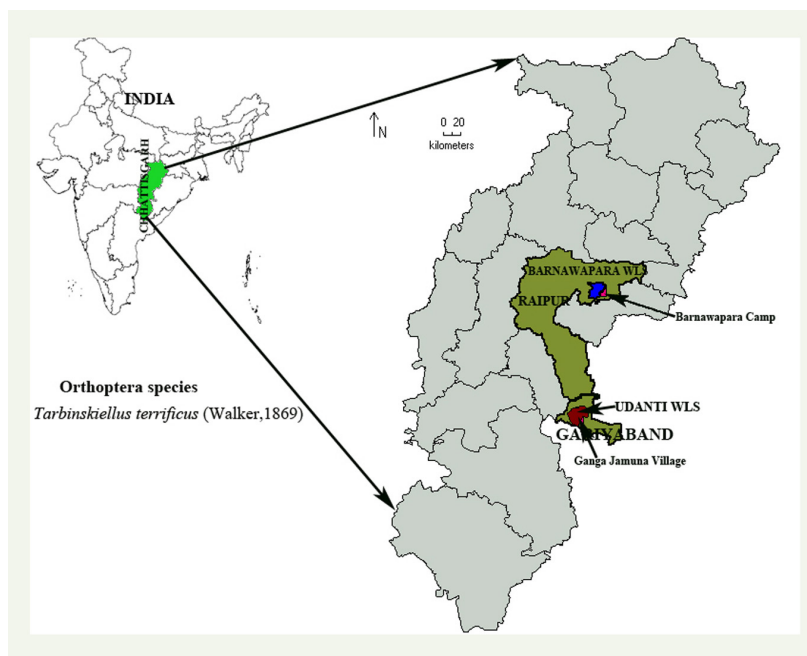


Figure 4. Distribution map of *T. terrificus* (Walker, 1869) A. India; coloured area denotes Chhattisgarh state; B. Raipur and Gariaband district, the triangle mark denotes the distribution of *T. terrificus*.

Conclusion

The result of this study is based on the examination of 2 specimens belonging to genus *Tarbinskiellus* (Gryllidae: Gryllinae). Both the specimens were collected from Barnawapara Wildlife Sanctuary (district Raipur) and Udanti Wildlife Sanctuary (district Gariaband). This species has been not reported except Walker, 1869 from, Chennai, Tamil Nadu (type specimen) later Chopard 1969 recorded from Karnataka (Mysore: Bhadravati) India. Since then, there were no reports on the occurrence of this species in India except Tamil Nadu and Karnataka. This species can be distinguished from related species by more robust and stout body, size more large, contrasting colour of elytra, pronotum and legs feebly pubescent, pronotum slightly widening, and female with ovipositor reduced.

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The specimens were collected during night in the months of April and June respectively. The field images along with the illustrations of male genitalia and stridulatory files are provided for the first time with the distribution map of the species.

Acknowledgements

The author is grateful to the Dr Kailash Chandra, Director, Zoological Survey of India, Kolkata, for providing necessary facilities. Thanks are due to CAMPA (Compensatory Afforestation Fund Management and Planning Authority) for funding the project work. Thankful to Dr. A. V. Gorochov for providing the literature on the group and valuable suggestions. The author is also grateful to all staff Orthoptera section for their support.