A NEW SPECIES OF THE GENUS Machadobelba (Acari: Oribatida: Machadobelbidae) FROM TRIPURA, INDIA

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ABSTRACT
The paper contains the description along with illustrations of a new species of oribatid mite, Machadobelba barbata, from Tripura, India.

KEYWORDS
Acarina, Oribatid mite, Machadobelba barbata sp. nov., New species, India.

Balogh (1958) established the genus with Machadobelba symmetrica as the type species from Belgian Congo. Later the same author described another new species, M. dispar from the same place (Balogh, 1959). Balogh initially placed the genus Machadobelba under the family Eremaeidae (Sellnick, 1928) and later transferred the genus from Eremaeidae to the newly erected family Machadobelbidae (Balogh, 1972). Balogh (1959) and Perez-Inigo (1968) also reported the type-species from East Africa and Gulf of Guinea respectively.

In addition to above, Csiszar (1961) described two more new species, simplex and tuberculata under this genus from Java. Balogh (1970) reported M. ceylonica from the soil of Sri Lanka. Hammer (1979) added one more new species, M. serrata from Java. Hammer (1982) further reported another new species, M. foliata from Bali. Mahunka (1987, 1988a, 1988b) described 4 more new species i.e. spathulifer, descombesi, similis and tanzica under this genus. He described the first three species from Sabah, East Malaysia and last one from Tanzania. Balogh (1988) described M. neotropica from the soil of Ecuador. The genus was first reported with description of a new species M. baloghi from India by Mondal and Kundu (1999).

Until now, 13 species of Machadobelba are known from the world. The genus Machadobelba is being recorded here for the second time from India.

General diagnosis
Prodorsum with one pair of distinct costulae; sensillus simple and directed forward or bifurcate; basal part of lamellae converging, apical part subparallel; pedotecta I well developed; ten pairs of notogastral setae; six pairs of genital setae; one pair of aggenital setae; two pairs of anal setae; three pairs of anal setae; five pairs of genital setae; one pair of adanal setae; legs monodactylous.

Distribution
India: Tripura, West Bengal. Elsewhere: Annobon Is. (Gulf of Guinea), Belgian Congo, East Africa, Ecuador, Indonesia (Java, Bali), Russia, Sri Lanka, Sabah (E. Malaysia), Tanzania.

METHODOLOGY
Soil, litter and humus samples from all possible habitats in South district of Tripura were collected from upper 5-10cm of soil profile. The extraction of mites was carried out by using a battery of Tullgren's Dry funnel extraction apparatus and the mites were collected in glass vials containing a mixture of 70% alcohol and 5% glycerol. Prior to identification the mites were desclerotized in lactic acid.

The measurements of the specimens are given in micron (µm). The type specimens are deposited in the National Zoological Collection, Zoological Survey of India, Kolkata.

Machadobelba barbata sp. nov.
(Figs. 1-3)

Material Examined
Holotype: Female, 2.i.1992, from humus beside Gomti river Jatanbari (Amarpur), Tripura, India, coll. S. Saha (ZSI, Kolkata).
Paratypes: 2 females, data same as for holotype.

Diagnosis
Colour: Light brown.

Measurements: Body length 259µm; body width 117µm.

Prodorsum: Rostrum rounded; rostral setae moderately long (9µm), arise from tip of prolamella, anterolateral 2/3 part barbed on both sides; line of lamella continued forward to rostrum as prolamella, basally ending in large tubercules, which oppose inner notogastral tubercules; lamellar setae more close to interlamellar setae than to rostral setae; both lamellar setae (14) longer than rostral setae, unilaterally barbed; sensillus deeply bifurcated, inner ramus rough in appearance, outer ramus finely pilose on outer side only; prodorsum smooth, interlamellar region with markings.

Notoanterosetae: Notoanterosetae oval, with two pairs of prominent lateral condyles situated anteriorly along margin of dorsosejugal suture, median condyles continued in long keel, larger and wider than lateral notogastral ones; 10 pairs of notogastral setae; moderately long (9-19µm), stiff, distally barbed, with blunt tip distance r1-r1 < ta-ta < r2-r2 < ms-ms < ti-ti < r2-r2 < te-te.

Epimeral Region: Epimeral plate well developed, strongly chitinised, all epimeres well separated from each other; epimeres...
region foveolated; epimeral seta short (9-10µm), simple, epimeral setal formula 3-1-3-4.

**Ano-genital region:** Genital plates more or less squarish in shape (length: 21µm, width: 23µm) with six pairs of simple, short (7-8µm) setae; anterior four setae placed closely in longitudinal row, two others in oblique row in front of posterior margin of genital plates; one pair of smooth aggenital, three pairs of adanal setae; ventral side smooth except two punctuated patches on both sides of anal plates; anal plates rectangular in shape (length: 35µm, width: 45µm) with two pairs of short (8-9µm), simple setae; distance between genital and anal apertures more than twice the length of anal apertures.

**Legs:** Legs monodactylous. Leg chaetotaxy: Leg I: 0-4-2-3+1-19+1-1; Leg II: 0-3-2-4-13--1; Leg III: 1-2-0-3-14-1; Leg IV: 0-1-1-4-11-1.

**Remarks**

All the known Machadobelba species can be broadly divided into two groups viz., one with deeply bifurcate sensillus and the other with simple filiform, long, pointed sensillus. The former includes species like *M. symmetrica* Balogh, 1958, *M. dispar* Balogh, 1959, *M. cylonica* Balogh, 1970 and *M. neotropica* Balogh, 1988 and the latter group includes species like *M. simplex* Csiszar, 1961, *M. tuberculata* Csiszar, 1961 and *M. serrata* Hammer, 1979. The present species falls in the former group and is comparable to *M. dispar* due to the presence of prominent prolamellae reaching up to rostral tip and structure of sensillus. But in this specimen the inner ramus of sensillus is little longer than the outer one whereas in *M. dispar* the inner ramus is only half as long as the outer. In *M. dispar* notogastral setae smooth but in the present specimen distal half of the notogastral seta is barbed and the tip is blunt. Further, presence of foveolated epimeral region and two punctuated patches on both sides of anal plates separate the new species from *M. dispar*.

The new species shows similarity with Indian species *M. baloghi* Mondal and Kundu, 1999 only in presence of bifurcate sensillus. It strongly differs from *baloghi* in length and width of body and length and shape of prodorsal setae. Further in the new species the epimeral region is foveolated and punctated patches are present near anal plates.

**REFERENCES**


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**Key to the Indian species of Machadobelba**

2(1). Average body length 328, average width 175; ro smooth; la and in long, feathered; two rami of sensillus very long, equal in length; notogastral setae long (6-32), feathered; epimeral region not foveolated; no punctuated patches on the sides of anal plates ................................................................. *baloghi* Mondal & Kundu, 1999

1(2). Average body length 259, average width 117; anterior 2/3 part of ro barbed; la and in moderately long, barbed; two rami of sensillus moderately long, inner ramus is longer than outer one; notogastral setae, small, stiff, distally barbed; epimeral region foveolated; two light punctuated patches on the sides of anal plates ................................................................. *barbata* sp. nov.
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ACKNOWLEDGEMENT
The authors thankfully acknowledge the help in terms of providing laboratory facilities by Dr. J.R.B. Alfred, Director, Zoological Survey of India, Kolkata.

NOTE ZOOS’ PRINT JOURNAL 20(5): 1858

MACROMORPHOLOGY OF HARD PALATE OF ADULT WHITE BENGAL TIGER (PANTHERA TIGERS TIGRIS)

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web supplement

A male adult white Bengal Tiger Panthera tigris tigris “Kashyap” aged 18 years died due to old age at the Assam State Zoo, Guwahati on 22 June 2003. Following postmortem examination, the hard palate was studied in situ.

Hard palate, the mucosal covering of the osseous palate, the roof of the oral cavity of the tiger was nearly flat, nonpigmented and was bounded laterally and rostrally by the upper dental arch. It was continuous laterally with the mucous membrane with the gums and caudally with the soft palate. Median palatine raphae was absent in the tiger unlike dog (Nickel et al., 1979) who possesses indistinct palatine crest.

Palatine ridges numbering eight pairs are transversely oriented in the hard palate of the tiger, 6-10 pairs in dog and seven pairs in cat (Nickel et al., 1979). The ridges were cornified. The first four pairs of palatine ridges in the tiger were semicircular. Caudally, 5th, 6th and 7th pairs (Image 1) of ridges were distinctly concave caudally while the last or 8th pair was transversely placed being 1.73cm in length. There were rows of papillae on either side being rostral and caudal to the palatine crest. There were 7-9 curved ridges in cats and papillae were present in the grooves between the ridges. The incisive papilla was present just caudal to the central incisors which was rhomboid in shape with an average width of 0.8cm. Incisive ducts opened on either side of the incisive papilla in tiger similar to dog and cat (Nickel et al., 1979). Close examination of the palatine ridges revealed presence of small blunt eminences caudally directed as in dog (Evans & Christensen, 1979).

REFERENCES


ACKNOWLEDGEMENTS
The authors are grateful to the Dean, Faculty to Veterinary Science for providing necessary facilities in condition of this research. They also thank Mr. Narayan Mahanta, D.F.O., Dr. H.C. Deka and Dr. Bijoy Gogoi, Assam State Zoo, for their help in providing the specimen for conducting the research work.

©Zoo Outreach Organisation; www.zoosprint.org; Manuscript 1103; Received 22 Oct. 2003; Finally accepted 2 Jan. 2005; Date of publication 21 Apr. 2005

Advt. No. WII/RES/A.3.6(2)-2005
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