

## New species and records of tribe Sericini of Manipur, India (Coleoptera: Scarabaeidae: Melolonthinae)

Debika Bhunia<sup>1,2</sup>, Devanshu Gupta<sup>1</sup>, Subhankar Kumar Sarkar<sup>2</sup> and Dirk Ahrens<sup>3</sup>

<sup>1</sup>Zoological Survey of India, M Block, New Alipore, Kolkata, 700053, West Bengal, India.  
dbhunias92@gmail.com, debikazoo22@klyuniv.ac.in, <https://orcid.org/0000-0002-7957-0334>  
devanshuguptagb4102@gmail.com, <https://orcid.org/0000-0001-9188-4689>;

<sup>2</sup>Entomology Laboratory, Department of Zoology, University of Kalyani, Kalyani -741235, West Bengal, India  
sksarkar2018@klyuniv.ac.in, <https://orcid.org/0000-0002-4129-2148>

<sup>3</sup>Zoologisches Forschungsmuseum Alexander Koenig Bonn, Adenauerallee 127, 53113 Bonn, Germany.  
E-mail: [ahrens.dirk\\_col@gmx.de](mailto:ahrens.dirk_col@gmx.de), <https://orcid.org/0000-0003-3524-7153>

### Abstract

Here we describe one new species from Manipur, India: *Maladera bezdeki* Bhunia, Gupta, Sarkar & Ahrens. Moreover, *Maladera drescheri* (Moser, 1913), *M. freyi* Ahrens & Fabrizi 2016, *M. rufotestacea* (Moser, 1915), and *Maladera satrapa* (Brenske, 1898), are recorded from Manipur state of India for the first time. Diagnostic morphology of the new species is described and illustrated, and the updated species distribution is shown on a map.

**Keywords:** Biodiversity hotspots, morphology, Northeast region, taxonomy

### Introduction

Beetles of the tribe Sericini (Coleoptera: Scarabaeidae: Melolonthinae) are herbivores in adult life stages and are known with nearly 4,600 described species globally. Of these, over 682 species are known from India (Ahrens & Fabrizi 2016; Sreedevi *et al.* 2018, 2019; Chandra *et al.* 2021; Bhunia *et al.* 2021; Bhunia *et al.* 2022), accounting for 16% of their global diversity. Most of the Indian species are reported from the Himalayas (Ahrens 2004) and the southern areas of the country (Ahrens & Fabrizi 2016). However, in many regions, such as the north-eastern states, the tribe remain largely unexplored or represented only by old collection records which have too imprecise data to be geo-localized. While working on unidentified Sericini beetles of Manipur state, we have found five interesting species, of which we describe one new species of the *Maladera thomsoni* group. Moreover, four species belonging to two genera are recorded from Manipur state for the first time: *Maladera drescheri* (Moser, 1913), *M. freyi* Ahrens & Fabrizi 2016, *M. rufotestacea* (Moser, 1915), and *M. satrapa* (Brenske, 1898). These new data show that

there is continued urgent need to further explore the diversity of the species in the unexplored, white spots in India that will help to get insights on systematics, distribution, and biodiversity of Indian Sericini. The morphology of the new species is described and illustrated and its distribution is illustrated.

### Material and methods

Manipur is biogeographically located in the north-eastern part of India, covering an area of 22,327 km<sup>2</sup>. It is bounded by the Indian states of Nagaland to the north, Mizoram to the south, Assam to the west, and by Myanmar in the east.

The unidentified pinned and dry preserved collections of N.Z.C. of ZSI, Kolkata were studied. The aedeagus was dissected by softening the specimens; after dissection it was kept in 10% KOH for 10 minutes to clear the hard sclerotised structures. For identification of the species, the male genitalia of all the specimens were examined. All the specimens were examined either using a Nikon SMZ-25

stereo zoom microscope, and illustrations were taken through the microscope using the software NIS-Elements BR 5.10.00 or with a Leica M125 stereo microscope with a Leica DFC420C digital camera using the Leica Application Suite (ver. 3.3.0). The resulting images were subsequently digitally edited to remove reconstruction errors and to obtain a white background. The type material is deposited as indicated along the material examined. A distribution map was prepared using the software QGIS 2.8.1.

The following code identifies the collection housing the examined material:

NZSI—Zoological Survey of India, Kolkata, India.

## Results

### Systematic account

Order **Coleoptera** Linnaeus, 1758

Suborder **Polyphaga** Emery, 1886

Superfamily **Scarabaeoidea** Latreille, 1802

Family **Scarabaeidae** Latreille, 1802

Subfamily **Melolonthinae** Leach, 1819

Tribe **Sericini** Kirby, 1837

**Diagnostic Characters:** Genus *Maladera* Mulsant & Rey, 1871 is one of the diverse genus of tribe Sericini (Coleoptera: Scarabaeidae: Melolonthinae) consisting of many subgenus and group under it. Genus *Maladera* can be distinguished with other genera by having protibia with two teeth, Antennal club in male with three or four antennomeres. More than, 400 species of Sericini are currently known from the Indian subcontinent.

### New species

***Maladera bezdeki* Bhunia, Gupta, Sarkar & Ahrens, new species**

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(Figures 1–5)

**Type locality.** India: Manipur, Churachandrapur, Circuit House, 24.3429N, 93.7005E.

**Type material.** Holotype, male: “India: Manipur, Churachandrapur, Circuit House, 24.3429N, 93.7005E, 19.v.1993, leg. B. Mitra” (NZSI).

**Description of the holotype, male. Body.** Length: 9.21 mm, length of elytra: 5.28 mm, width: 4.38 mm. Body oblong-oval, yellowish brown, dorsal surface dull, dorsal surface glabrous.

**Head.** Labroclypeus subtrapezoidal, distinctly wider than long, widest at base, lateral margins nearly straight, convergent anteriorly, anterior angles strongly rounded, anterior margin weakly sinuate medially, margins weakly reflexed; lateral margin and ocular canthus produce an indistinct angle; surface flat, finely, densely punctate, with a very few single setae; twice as wide as long; ocular canthus short and moderately narrow (1/3 of ocular diameter), finely densely punctate, with a terminal seta. Frons with sparse punctures, with many long, erect setae beside eyes. Eyes moderately large, ratio diameter/interocular width: 0.68. Antenna with ten antennomeres, club with three antennomeres and straight, as long as the remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly.

**Pronotum** moderately transverse, widest at the base, lateral margins moderately and evenly convex and more strongly convergent anteriorly; anterior angles distinctly produced and sharp; posterior angles blunt and weakly rounded at tip; anterior margin straight, with robust marginal line, base without marginal line; surface moderately densely and finely punctate, with minute setae in punctures; anterior and lateral margin finely sparsely setose; hypomeron carinate, not produced ventrally. Scutellum wide, triangular, with fine, moderately dense punctures, impunctate on midline.

**Elytra** widest at middle, apex truncated, striae finely impressed, finely and densely punctate, intervals nearly flat, with fine, moderately dense punctures concentrated along striae and with minute setae in punctures; epipleural edge robust, ending at blunt external apical angle of elytra, epipleura sparsely setose; apical border of elytra membranous, with a fine rim of microtrichomes (visible at ca 100x magnification).

**Ventral surface** dull, finely and densely punctate, nearly glabrous, metasternal disc sparsely covered with fine, short setae; metacoxa with a few longer setae laterally. Abdominal sternites finely and densely punctate, punctures with minute setae, each sternite with a transverse row of punctures each bearing a fine seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.75. Pygidium strongly but evenly convex, dull, finely and densely punctate, without smooth midline, with long setae along apical margin.

**Legs** short and wide, dull; femora with two longitudinal rows of setae, finely and sparsely punctate. Anterior margin of shiny metafemur acute, without adjacent serrated line, anterior row of setae completely reduced; posterior ventral margin smooth, strongly widened at ventral apex, dorsal posterior edge smooth, neither serrate, glabrous. Metatibia short and very wide, widest at middle, ratio of width/length: 1/2.5, sharply carinate dorsally, with two groups of spines, basal group at middle, apex finely serrate, shallowly sinuate interiorly near tarsal articulation. Tarsomeres dorsally impunctate, glabrous, neither laterally nor dorsally carinate, moderately setose ventrally; metatarsomeres with a strongly serrated ridge ventrally and a smooth subventral longitudinal carina, glabrous; first metatarsomere slightly shorter than following two tarsomeres combined and slightly longer than dorsal tibial spur. Protibia moderately long, bidentate; anterior claws symmetrical, basal tooth of both claws bluntly truncate at apex.

Aedeagus: Figure 1–4. Habitus: Figure 5.

**Diagnosis.** *Maladera bezdeki* Bhunia, Gupta, Sarkar & Ahrens, new species is in its shape of the genitalia and its external appearance very similar to *M. balphakramensis* Ahrens and Fabrizi, 2016. From *M. balphakramensis* the new species differs by the shorter and curved parameres, having a long dorsal lobe at the left paramere instead at the right one. *Maladera bezdeki* differs from all other so far known species of the *M. thomsoni* group by the strongly curved parameres which are in all other species usually straight; and the dorsal lobe which is strongly reflexed and bent laterally, while it is only weakly curved in the other taxa.

**Etymology.** This new species (noun in the genitive case) is dedicated to Dr Aleš Bezděk, curator, Institute of Entomology, Academy of Sciences of the Czech Republic, in honor and gratitude for his relentless effort to study and catalogue the Oriental and Palearctic Melolonthinae.

**Distribution.** The species is only known from the type locality in Mizoram (Figure 22)

## New records

### *Maladera drescheri* (Moser, 1913)

(Figure: 6-9)

*Autoserica drescheri* Moser, 1913: 294.

*Maladera drescheri*: Ahrens 2004b: 278; Krajcik 2012:154.

*Autoserica dalatensis* Frey, 1969b: 107; syn. by Ahrens 2004b: 278.

*Maladera drescheri*: Ahrens & Fabrizi 2016: 263.

**Material examined.** 2 males: India: Imphal, West Imphal Valley, 24.7828° N, 93.8859° E, 04.vi.1945, coll. M.L. Roonwal. (NZSI).

**Remarks.** This is the first state record for Manipur state of India (Figure 22). Previously recorded from Meghalaya (Ahrens & Fabrizi 2016).

### *Maladera freyi* Ahrens & Fabrizi, 2016

(Figure: 10-13)

*Cephaloserica opaca* Frey, 1975b: 229.

*Maladera opaca*: Ahrens 2004b: 238; Krajcik 2012: 155.

*Maladera freyi* (replacement name): Ahrens & Fabrizi 2016: 167; Chandra *et al.* 2021: 503.

**Material examined.** 1 male: India: Manipur, Churachandpur, Boumba, 24.3429N, 93.7005E, 15.iv.1992, coll. S. K. Saha (NZSI).

**Remarks.** This is the first state record for Manipur state of India (Figure 22). Previously recorded from India (West Bengal, Meghalaya), Bhutan, and Nepal (Ahrens & Fabrizi 2016, Chandra *et al.* 2021).

### *Maladera rufotestacea* (Moser, 1915)

(Figure: 14-17)

*Maladera rufotestacea*: Ahrens & Fabrizi 2016: 210

**Material examined.** 1 male: India: Manipur, Tamenglong, 24.990 N, 93.5006 E, 26.v.1981, coll. Radhakrishnan (NZSI).

**Remarks.** This is the first state record for Manipur state of India (Figure 22). So far the species is known from India (Meghalaya), China, Thailand, Myanmar, Vietnam (Ahrens & Fabrizi 2016).

### *Maladera satrapa* (Brenske, 1898)

(Figure: 18-21)

*Autoserica satrapa* Brenske, 1898: 341.

*Maladera satrapa*: Krajcik 2012: 155. : Ahrens & Fabrizi 2016: 137

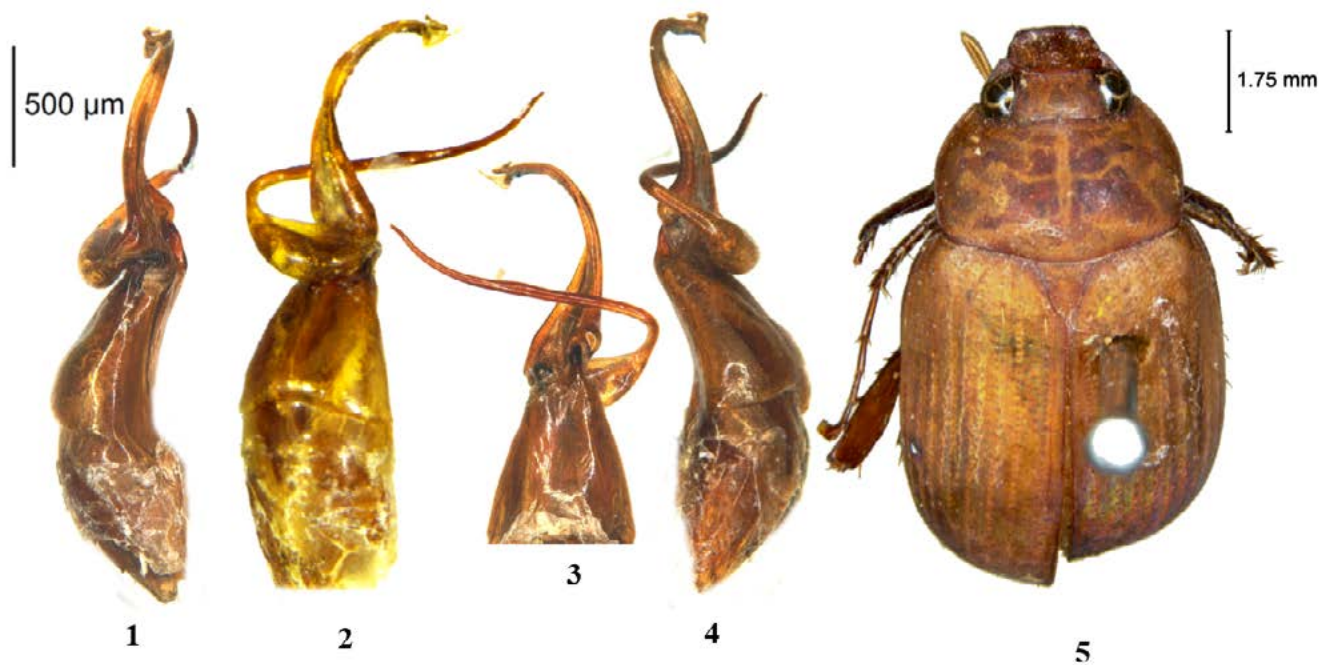
**Material examined.** 1 male: India: Manipur, Bishnupur, Keibul- Lamjao National Park, 24.4788° N, 93.8395° E, 02.iii.1994, coll. S.K Saha. (NZSI).

**Remarks.** This is the first state record for Manipur state of India (Figure 22). Previously recorded from Meghalaya (Ahrens & Fabrizi 2016).

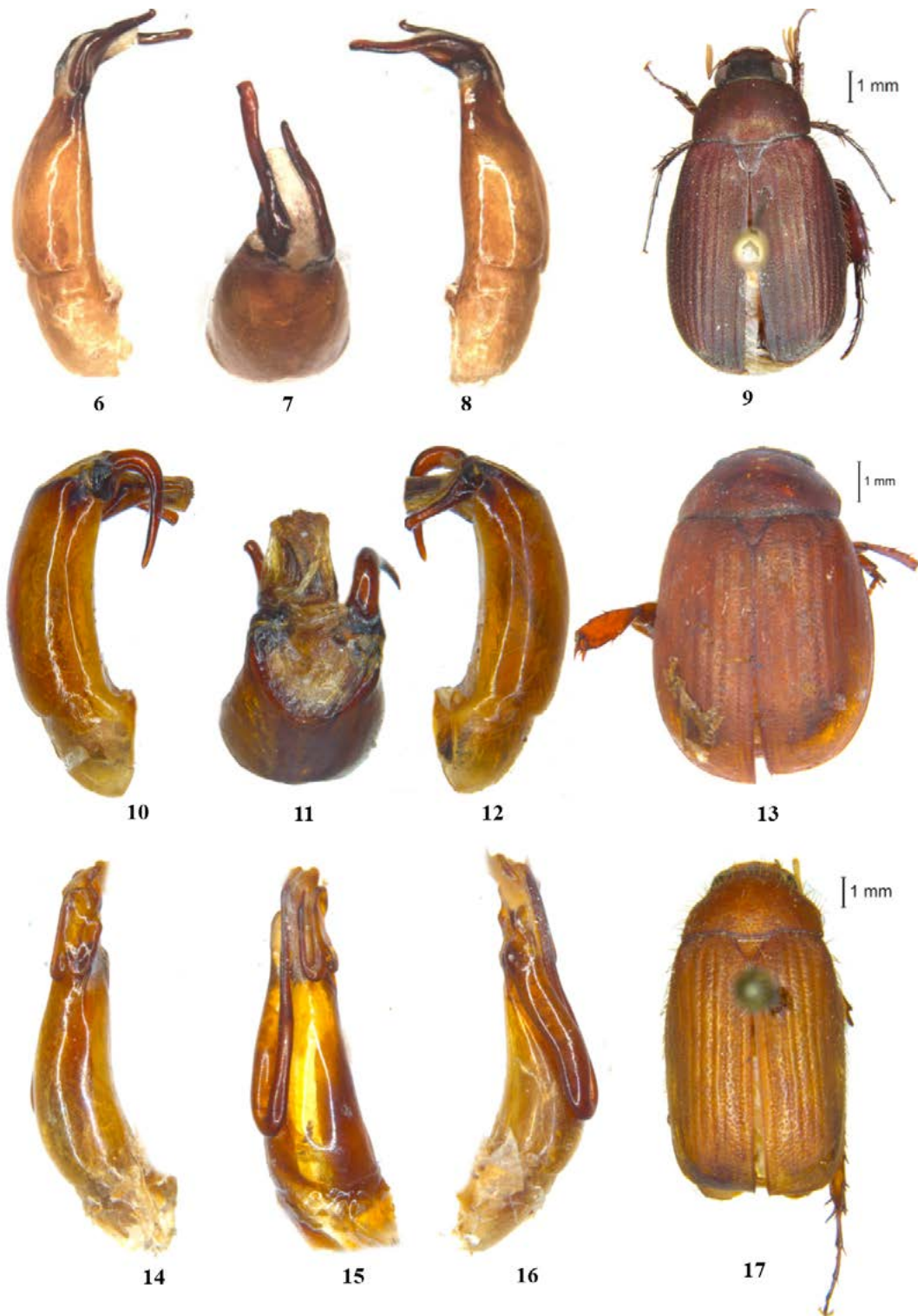
## Discussion

The present study is very much relevant as it closes some important gaps in the knowledge of the distribution of Indian Sericini. As a result, one new species of the *Maladera thomsoni* group, *Maladera bezdeki* Bhunia, Gupta, Sarkar & Ahrens, new species, has been added, including four new records to the state of Manipur, India. All the three reported *Maladera drescheri* (Moser, 1913), *M. rufotestacea* (Moser, 1915), and *Maladera satrapa* (Brenske, 1898), seem to be endemic to north eastern region of India, except *Maladera freyi* Ahrens & Fabrizi, 2016 which has recently been reported from West Bengal (Chandra *et al* 2021), although a lot more vigorous study will unveil the actual figure. This

study which provides some ideas that there is always a pressing need to update the species distribution, particularly in the unexplored parts of India, is very important since many of the local endemic and autochthonous species are potential crop pests as they are phytophagous (Ahrens *et al.* 2009). Thus, these new records in these underexplored areas encourage further sampling with light traps there despite their high population density for further faunistic and taxonomic investigations, which hopefully will also help to further explore the ecology of the species.



**FIGURE 1-5.** *Maladera bezdeki* Bhunia, Gupta, Sarkar & Ahrens, new species (holotype); (1) aedeagus in lateral view (left); (2) aedeagus in dorsal view; (3) aedeagus in ventral view; (4) aedeagus in lateral view (right); (5) habitus, dorsal view. aedeagus (1-4), scale 0.5 mm.



**FIGURE 6-17.** 6-9. *Maladera drescheri* (Moser, 1913); (10-13). *Maladera freyi* Ahrens & Fabrizi, 2016; 14-17. *Maladera rufotestacea* (Moser, 1915); (6, 10, 14) aedeagus in lateral view (left); (7, 11, 15) aedeagus in dorsal view; (8, 12, 16) aedeagus in lateral view (right); (9, 13, 17) habitus, dorsal view. scale 0.5 mm.



FIGURE 18-21. *Maladera satrapa* (Brenske, 1898), (18) aedeagus in lateral view (left); (19) aedeagus in dorsal view; (20) aedeagus in lateral view (right); (21) habitus, dorsal view. aedeagus (1-4), scale 0.5 mm.

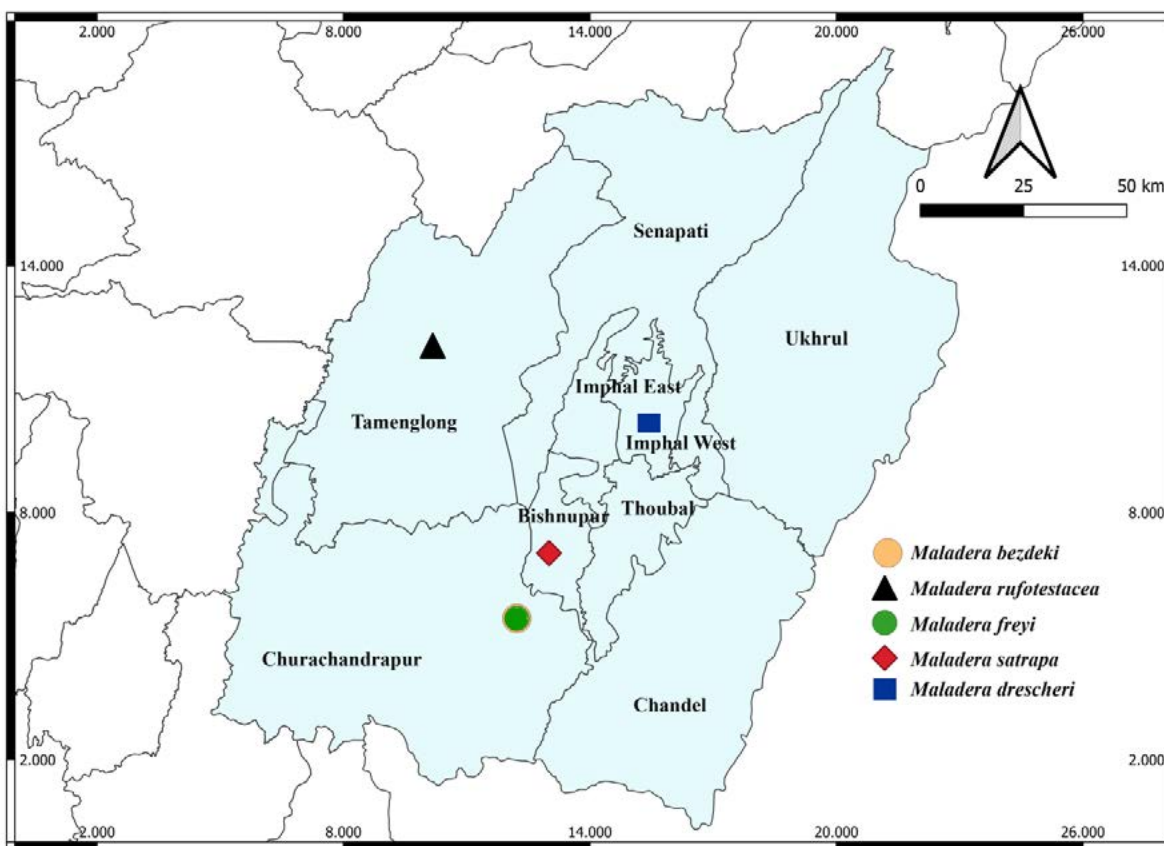


FIGURE 22. Map of Manipur showing the location of the type locality of the new species, *Maladera bezdeki* Bhunia, Gupta, Sarkar & Ahrens, sp. nov., as well as the new state records of *Maladera rufotestacea* Ahrens & Fabrizi, 2016, *M. freyi* Ahrens & Fabrizi, 2016, *M. satrapa* (Brenske, 1898), and *Maladera drescheri* (Moser, 1913).

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