

First record of the genus *Lemuriana* Distant, 1905 (Hemiptera, Cicadidae, Lamotialnini) from Kerala, India

A. Anjana and K.T. Teji^{*#}

Department of Zoology, Union Christian College, Aluva 683102, Affiliated with Mahatma Gandhi University, Kerala, India.

[#]Department of Zoology, Morning Star Home science College, Angamaly 683573 Affiliated with Mahatma Gandhi University, Kerala, India.

Email: drtejiktzoologymorningstar@gmail.com, anjanaa4research@uccollege.edu.in

ABSTRACT: The cicada *Lemuriana apicalis* (Germar, 1830) (Hemiptera, Cicadidae, Lamotialnini) is reported for the first time from Kerala, India. © 2025 Association for Advancement of Entomology

KEY WORDS: Range extension, cicada, distribution, *Lemuriana apicalis*, Western Ghats

Cicadidae, one of the two families of cicada, comprises slightly more than 3000 species and encompasses practically all extant cicada species in the world (Zhou and Lei, 1997; Sanborn, 2013; Marshall *et al.*, 2016, 2018; Barlett *et al.*, 2018; Simon *et al.*, 2019). The genus *Lemuriana* Distant, 1905 belongs to the tribe Lamotialnini in the family Cicadidae and subfamily Cicadettinae (Marshall *et al.*, 2018). The genus *Lemuriana* was erected by Distant for *L. apicalis* (Germar, 1830) from Bengal and *L. flavocostata* Distant, 1905 from British East Africa (Distant, 1905). *Lemuriana apicalis* was designated as the type species of the genus (Distant, 1906b). The African species of the genus *Lemuriana*— *L. flavocostata* Distant, 1905, *L. consobrina* Distant, 1920 and *L. sirius* Distant, 1899 were transferred to the genus *Trismarcha* Karsch, 1891 by Boulard in 1975. *Lemuriana connexa* Distant, 1910 from Borneo was transferred to the new genus *Unduncus* Duffels, 2011 and *L. chandaea* Moulton, 1911 from Borneo was made a junior synonym of *Abroma kedenburgi*

and transferred to the new genus *Allobroma* Duffels, 2011. In its current definition *Lemuriana* includes three species: *L. apicalis* (Germar, 1830) from Bengal and India, *L. cambodiana* Lee, 2010 from Cambodia (Lee, 2010) and *L. vinhcuuensis* Pham and Yang, 2010 from Vietnam (Pham and Yang, 2010).

During field work for cicadas in a dry deciduous forest in the Attapadi region of Palakkad district of Kerala state, in the Nilgiris landscape, the authors came across a few cicadas that matched the description of *Lemuriana*. These specimens were collected using long handled insect collecting nets, preserved in absolute alcohol and pinned for study. Detailed morphological examination was done with HEADZ Model HD81 stereomicroscope. Photographs were taken with Nikon D90 Digital SLR camera and 50mm f/1.8 Nikkor lens. (Figure 2 & 3). The pinned and dried specimen was taken and the last sternite was removed to expose the pygofer of the male genitalia. Pygofer in ventral

* Author for correspondence

and lateral view examined using HEADZ Model HD81 stereomicroscope and photographed with Canon 70D Digital SLR camera, Canon 180 mm macro lens, and MPE 65 f 2.8 1e5x Lens (Fig. 4). Morphometric measurements of the adult cicadas were obtained from images using ImageJ (64-bit Java 1.6.0) software. For each of the two specimens, each morphometric parameter was measured five times, resulting in a total of 10 measurements per parameter. The mean and standard deviation were subsequently determined for each of the morphometric parameters. Finally, the standard error is calculated by dividing the standard deviation by the square root of the number of measurements. The indices and measurements used in the description are in cephalocaudal order, as per Sadasivan (2021), and are taken in millimetres (mm) in the dorsal view unless otherwise specified. Head length (HL)—length of the head in the midline from the anterior-most point of the postclypeus to the mid-posterior margin of the head, measured dorsally. Head width (HW)—width of the head including the compound eye, measured between the lateral-most points of convexity of the compound eye in dorsal view in the transverse plane. Eye length (EL)—in the dorsal view. Pronotum length (PL)—at the mid-dorsal line. Pronotum width (PW)—maximum width, measured in dorsal view. Mesonotum length (ML)—Mesonotum mid-dorsal length to the cruciform elevation, in dorsal view. Mesonotal width (MW)—width of Mesonotum. Forewing length (FWL)—the maximum expanse of the forewing from its medial most attachment to the mesonotum to the most convex part of its apex. Forewing width (FWW)—distance between the node and the tornus across the forewing. Hindwing length (HWL)—the maximum expanse of the hindwing from its medial most attachment to the mesonotum to the most convex part of its apex. Abdomen length (AL)—mid-dorsal length of the abdomen measured from the posterior-most point on the cruciform elevation to the tip of the pygofer or anal style, whichever is the farthest, in the freshly killed insect. Abdomen width (AW)—the maximum width measured in the transverse plane in dorsal view. Operculum length (OPL)—in lateral view. Rostrum length (RL). Anterior body length (ABL)—length of the specimen from the anterior

tip of postclypeus to the posterior of scutellum in the midline. HL + PL + ML is Total Length (TL); HL + PL + ML + AL is Cephalic Index (CI); (HW/HL) $\times$ 100 is Ocular Index (OI); (EL/HW) $\times$ 100 is Pronotal Index (PI); (PW/PL) $\times$ 100 is Mesonotal Index (MI); (MW/ML) $\times$ 100 is Opercular Index (OPI); (OPL/ABL) $\times$ 100 is Anteroposterior Index (API); ABL/AL $\times$ 100 is Rostral Index (RI); (RL/ABL) $\times$ 100 is Forewing Aspect Ratio (FAR), high aspect ratio indicates long, narrow wings, and a low aspect ratio indicates short, wide wings. (FWL/FWW) $\times$ 100 is Forewing Index (FI); (FWL/ABL) $\times$ 100 is Inter-Wing Ratio (IWR); (FWL/HWL) $\times$ 100 is Gastral Index (GI); AW/AL $\times$ 100, high index value indicates a relatively wider abdomen. The diagnosis and brief description of *L. apicalis* along with morphometric measurements are provided below for the specimens from Kerala.

Family **Cicadidae Batsch, 1789**;
Subfamily **Cicadettinae Buckton, 1890**

Tribe **Lamotialnini Boulard, 1976**
Genus ***Lemuriana* Distant, 1905**

Type species ***Lemuriana apicalis***
(Germar, 1830)

Diagnosis: *Lemuriana apicalis* was formerly classified under the tribe Taphurini based on morphological characteristics (Duffels, 2011). However, Marshall *et al.* (2018) transferred *Lemuriana* to Lamotialnini based on molecular phylogenetic analysis, which demonstrated a closer evolutionary link with other genera in Lamotialnini. This molecular evidence, which studied evolutionary divergence and genetic clustering, formed the basis for its reclassification.

Short description: Head of *L. apicalis*: Notable postclypeus and vertex; with ferruginous markings. Pronotum: Broad black median fascia, expanded ends; middle portion obliterated; lateral portion black. Mesonotum: Black with paramedian yellow-brown fasciae, narrow anteriorly, widening along parapsidal sutures, narrowing near cruciform elevation; para median and lateral sigillae dark reddish-brown to black. Tegmen: Apical area lightly infuscated (dark/light brown); venation dark yellow

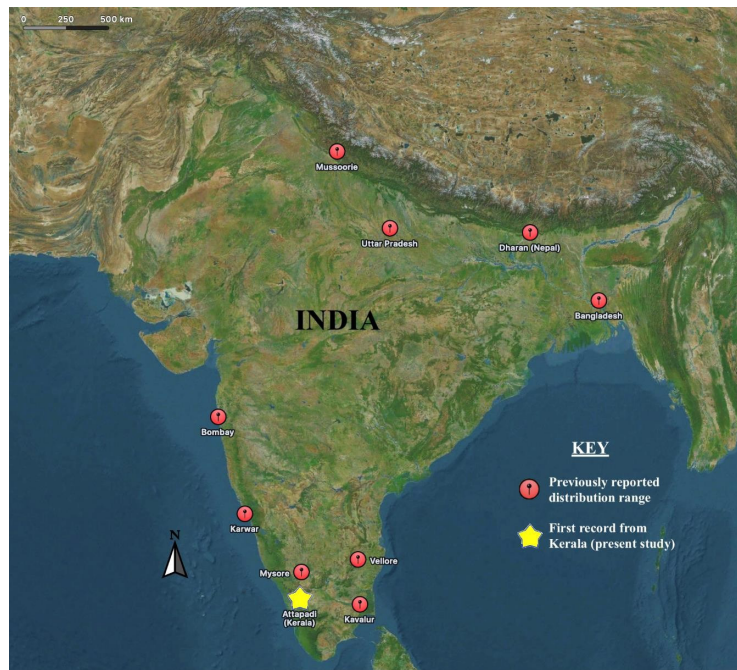


Fig. 1 A map showing the distribution of *Lemuriana apicalis* (Duffels, 2011 and Price *et al.* 2016). Modified from Apple maps, Copyright © 2012–2020 Apple Inc.

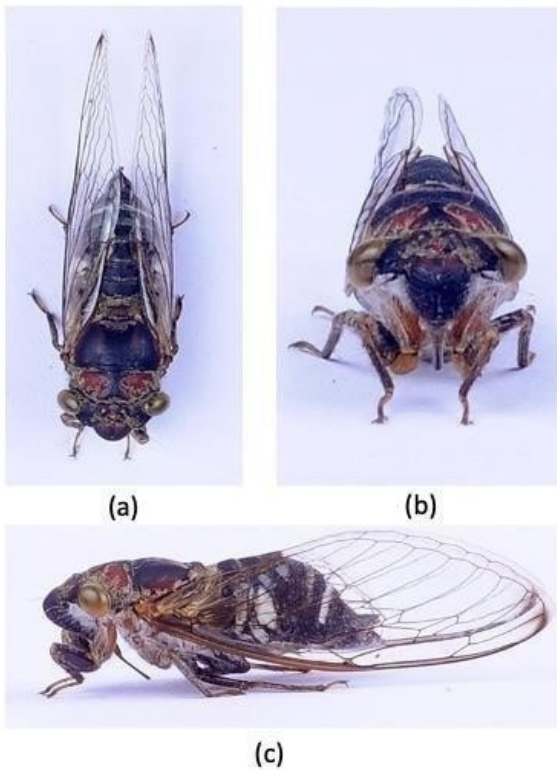


Fig. 2 *Lemuriana apicalis* (a) Dorsal view of the whole insect (b) Anterior view of the head. (c) Lateral view of the whole insect ©Anjana A.



Fig. 3 *Lemuriana apicalis*, male, dorsal view ©Anjana A.

to brown. Wings: Light brown, suffused on distal anal lobe. Legs: Light brown. Male operculum: Brown to black, extending to or beyond tympanal cavity; medial margin straight; lateral margin sinuate, concave basally, convex distally (Duffels, 2011).

Material Examined: 2♂♂; 04-vi-2024; Attapadi, Palakkad District, Kerala, India, (11°5' 23.64'' N; 76° 37' 21.72'' E); Dry deciduous forests; 957m ASL; Coll. Anjana. A.

Measurements (n=2): FWL–23.454±0.265;

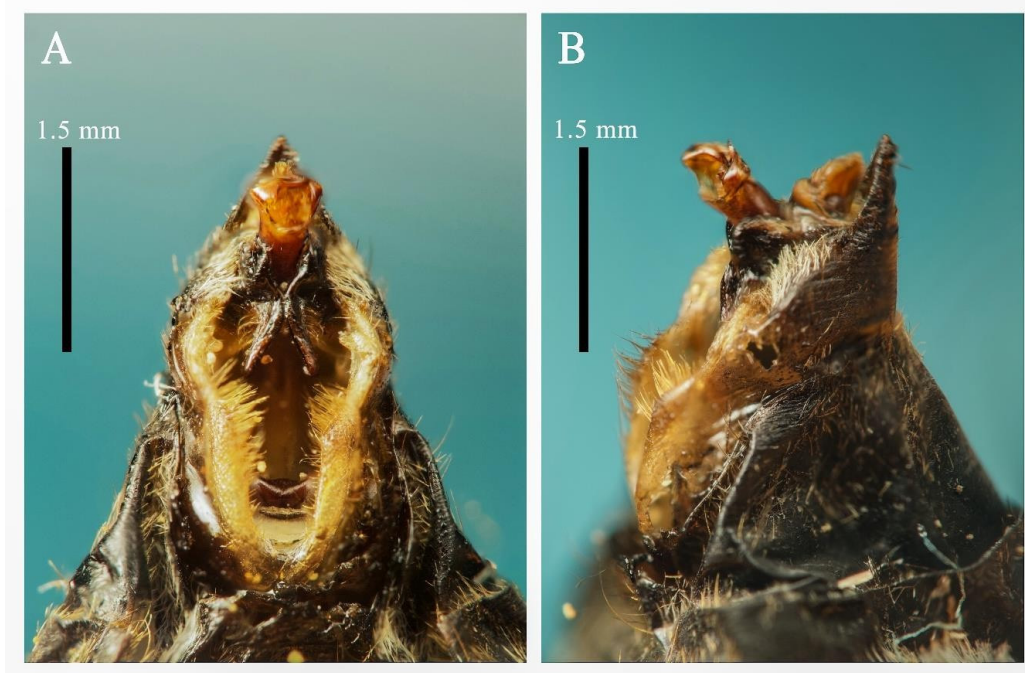


Fig. 4 *Lemuriana apicalis*, male, (A) Pygofer in ventral view (B) Pygofer in lateral view
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FWW– 7.99 ± 0.055 ; HWL– 11.872 ± 0.091 ; HL– 2.247 ± 0.038 ; HW– 6.92 ± 0.118 ; EL– 1.774 ± 0.054 ; PL– 2.259 ± 0.056 ; PW– 5.825 ± 0.024 ; ML– 4.305 ± 0.125 ; MW– 6.224 ± 0.2 ; AL 9.863 ± 0.037 ; AW– 5.719 ± 0.263 ; OPL– 5.044 ± 0.213 ; RL 1.787 ± 0.197 ; ABL– 8.811 ± 0.142 ; TL– 18.674 ± 0.147 ; CI 307.966 ± 7.396 ; OI– 25.636 ± 0.894 ; PI– 257.857 ± 6.48 ; MI 144.576 ± 6.261 ; OPI– 57.247 ± 2.588 ; API– 89.334 ± 1.478 ; RI– 20.281 ± 2.26 ; FAR– 293.542 ± 3.884 ; FI– 266.19 ± 5.239 ; IWR– 197.557 ± 2.697 ; GI– 57.984 ± 2.675 .

Updated Distribution: Attapadi (Palakkad district, Kerala); Bombay, Karwar, Bengal, Northern India, Mysore, United Provinces, Central Provinces (Price *et al.*, 2016); Oriental Region (Distant, 1906a, b); Mussoorie (Metcalf, 1963); Uttar Pradesh (Duffels and van der Laan, 1985) in India; Indochina & Nepal (Sanborn, 2014); Bangladesh (Duffels, 2011), and in Vietnam (Pham and Yang, 2010).

Remarks: In its present concept the genus *Lemuriana* encompasses three species: *L. apicalis* from Bombay, Karwar, Bengal, Northern India,

Mysore, United Provinces, Central Provinces (Price *et al.*, 2016); Oriental Region (Distant, 1906a, b); Mussoorie (Metcalf, 1963); Uttar Pradesh (Duffels and van der Laan, 1985) in India; Indochina & Nepal (Sanborn, 2014); Bangladesh (Duffels, 2011), Vietnam (Pham and Yang, 2010) and Attapadi, Kerala (present study), *L. cambodiana* Lee, 2010 from Cambodia (Lee, 2010) and *L. vinhcuuensis* Pham and Yang, 2010 from Vietnam (Pham and Yang, 2010). The detailed description of the three species in the genus is diagnosed and compared as per Lee (2010), Pham and Yang (2010) and Duffels (2011). The specimens exhibited a rugged head margin characterized by a prominent postclypeus and vertex, an apical fuscous spot on the forewing, an ochraceous costa, a fuscous operculum, and large lateral white spots extending to tergite 2, which are distinctive features of *L. apicalis*. Conversely, the other two species do not possess the apical spot, exhibit smoother head margins, and display variations in abdominal markings. The male genitalia, characterized by a slender, curved aedeagus and tapering uncus, aligns with *L. apicalis*, effectively excluding other species (Lee, 2010; Pham and Yang,

2010; Duffels, 2011). Hence, the specimens we examined from Kerala are identified and confirmed as *L. apicalis* (Germar, 1830). However, cicadas of the region need to be studied more thoroughly, particularly with emphasis on their distribution and ecological roles.

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