

Description of a new species of *Eidmanacris* Chopard, 1956 (Orthoptera: Phalangopsidae) from a cave in northeastern Brazil

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Abstract

Eidmanacris crickets are endemic to South America and are frequently associated with cave environments. The genus comprises 29 species, the majority of which are found in Brazilian territory. In this study, we describe a new species of *Eidmanacris* from a granite cave in northeastern Brazil, further reinforcing the genus association with subterranean habitats. Future inventories in unexplored karst regions may uncover additional species, expanding our understanding of the genus diversity and distribution.

Resumo

Os grilos *Eidmanacris*, endêmicos da América do Sul, são frequentemente encontrados em cavernas. O gênero compreende 29 espécies, a maioria das quais ocorre em território brasileiro. Neste estudo, descrevemos uma nova espécie de *Eidmanacris* proveniente de uma caverna no nordeste do Brasil, reforçando ainda mais a relação do gênero com ambientes subterrâneos. Inventários futuros em regiões cársticas inexploradas podem revelar novas espécies dentro do gênero.

1. Introduction

With over 190 genera (CIGLIANO et al., 2025), Phalangopsidae Blanchard, 1854 (Orthoptera: Ensifera: Grylloidea) is a widely distributed cricket family found across major biogeographical regions worldwide (DESUTTER-GRANDCOLAS, 1995a; CIGLIANO et al., 2025). The majority of its genera (approximately 70%) originate from the Neotropical region, while 10% are distributed among the Ethiopian, Australasian, and Oriental regions (DESUTTER-GRANDCOLAS, 1995a). Most species are hygrophilous, thriving in humid environments such as tropical forests and caves (DESUTTER-GRANDCOLAS, 1995a). They are typically brachypterous, exhibiting reduced or absent forewings, and are characterized by elongated antennae, legs, and cerci.

The genus *Eidmanacris* Chopard, 1954 comprises 29 species and is distinguished by supra-anal plates with posterolateral projections, fore tibiae without tympana, metanotal glands with an anteromedial triangular ridge, and short forewings lacking a stridulatory file (DESUTTER-GRANDCOLAS, 1995b; DE CAMPOS et al., 2017). As these crickets are unable to produce courtship songs, they rely on secreting nutritious substances from their metanotal glands to attract potential mates (DE CAMPOS et al., 2017). The metanotal gland is considered a key taxonomic feature

and is frequently used in species descriptions (DESUTTER-GRANDCOLAS, 1995b; SOUZA-DIAS et al., 2015; DE CAMPOS et al., 2017). However, three species of *Eidmanacris* lack metanotal glands: *E. endophallica* (DE MELLO, 1990), *E. fusca* Desutter-Grandcolas, 1995, and *E. tridentata* Desutter-Grandcolas, 1995 (DESUTTER-GRANDCOLAS, 1995b; DE MELLO, 2007; DE CAMPOS et al., 2017).

Species of *Eidmanacris* are frequently found in caves across southeastern and central-western Brazil. Among the 29 described species, six have been recorded in subterranean environments: *E. alboannulata* (Piza, 1960), *E. dissimilis* Desutter-Grandcolas, 1995, *E. larvaeformis* Chopard, 1938, *E. neomarmorata* De Campos, 2017, *E. scopula* De Campos, 2017, and *E. speluncae* (Mello-Leitão, 1937) (BOLFARINI et al., 2022). Notably, *E. neomarmorata*, *E. scopula*, and *E. speluncae* have caves as their type localities (CIGLIANO et al., 2025).

This study aims to describe a new species of *Eidmanacris* from a cave in northeastern Brazil, further contributing to the understanding of the genus' distribution and ecological associations with subterranean habitats.

2. Materials and methods

Collection and examination: The new species, *Eidmanacris* n. sp., was collected through active search in Toca da Raposa 2 cave (9°13'38.02"S, 35°54'47.49"W), located in the municipality of Murici, Alagoas state, Brazil. The adult male specimen was preserved in 70% ethanol and deposited in the Collection of Subterranean Invertebrates of Lavras (ISLA) at the Federal University of Lavras, Brazil.

The general morphology of the specimen was examined under a Stemi 508 (ZEISS) stereomicroscope. The phallic complex was dissected and subjected to pancreatin enzymatic digestion (ÁLVAREZ-PADILLA & HORMIGA, 2007) for 24 hours to facilitate the removal of muscle tissue and membranes. After enzymatic treatment, the phallic complex was rinsed in 70% ethanol and further analyzed under a Stemi 508 (ZEISS)

stereomicroscope.

For photographic documentation, an Axio Zoom V16 (ZEISS) stereomicroscope equipped with an Axiocam 506 camera (ZEISS) was used. Images were arranged into plates to highlight key morphological features, including forewing length, posterolateral projections of the supra-anal plate, and metanotal gland structure.

The description of the phallic complex follows the terminology proposed by Desutter-Grandcolas (2003) and later refined by de Campos et al. (2017). Comparative analyses were conducted based on literature data (DESUTTER-GRANDCOLAS, 1995b; DE CAMPOS et al., 2017; CIGLIA-NO et al., 2025) and *Eidmanacris* specimens stored in the Collection of Subterranean Invertebrates of Lavras (ISLA).

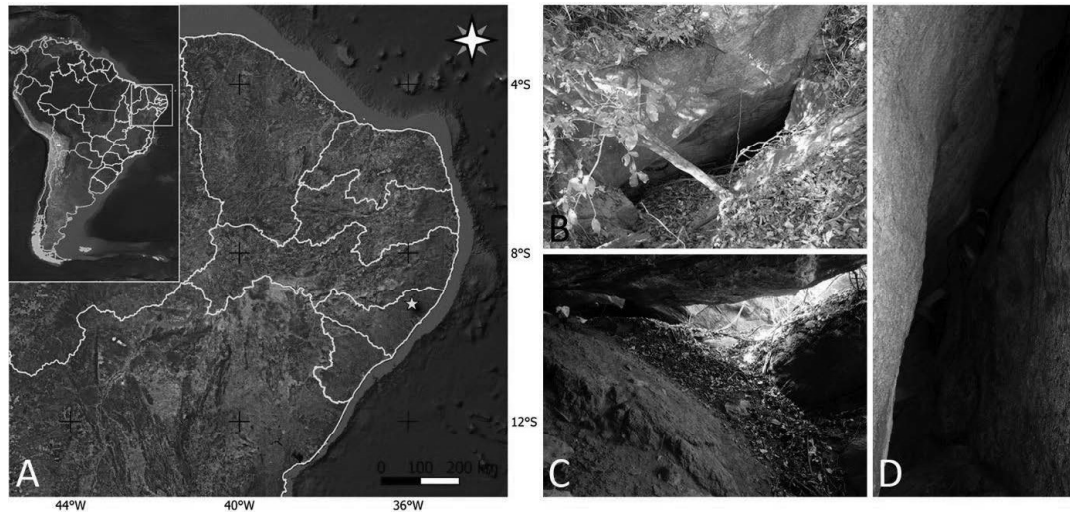


Figure 1: A) South America, northeastern region of Brazil highlighted, yellow star marks the type locality of *Eidmanacris* n. sp.; B) Entrance of Toca da Raposa 2 cave; C) First chamber of Toca da Raposa 2 cave; D) Inner chamber of Toca da Raposa 2 cave.

3. Results

Adult male description: Head. General color yellowish-brown; gena with an anteroventral brown spot; *fastigium* anteriorly brown; *frons* yellowish-brown, with three longitudinal brown stripes; *vertex* with a brown medial band and two light brown spots posterior to the compound eyes; *antennae* banded, with a large white portion in the middle.

Torax. *Pronotum* wide, brown with light brown spots; anterior margin broader than the posterior margin, lateral lobes slightly projected toward the head; *forewings* reduced, subtriangular, oriented inward, partially covering the *metanotum*, with a longitudinal white stripe, apex and inner margins white; metanotal gland present and anteriorly positioned, formed by a pair of pointed projections and an inverted-triangle ridge.

Legs. *Leg 1* pubescent, tympanum absent; *leg 2* pubescent, tibia serrulated, with two ventral apical spurs and one dorsolateral apical spur; *tibia 3* serrulated, with eight subapical spurs (four internal and four external, the two most distal shorter than the rest) and six apical spurs (three internal and three external, external spurs shorter than the internal).

Abdomen. *Supra-anal plate* light yellowish-brown, covered with long setae, posterior margins ventrally brown, with two lateroposterior short projections; subgenital plate elongated, light yellowish-brown, covered with short bristles; paraprocts as long as the supra-anal plate.

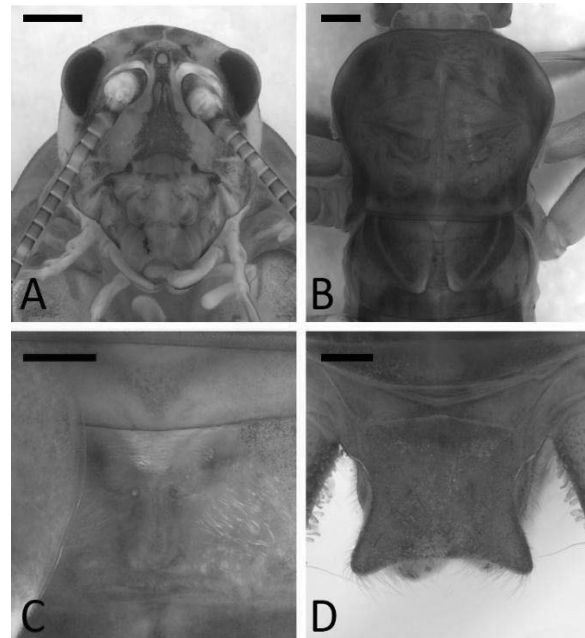


Figure 2: Adult male of *Eidmanacris* n. sp.; A) head, frontal view; B) Pronotum and forewings, dorsal view; C) Metanotal gland, dorsal view; D) Supra-anal plate, dorsal view.

Phallic complex. *Pseudepiphallic base* developed, lateral portions rounded and concave; *pseudepiphallic arms* curved dorsally, apex sclerotized and slightly folded over itself, distal portion with a short pointed dorsal projection, which is directed inward; *pseudepiphallic anterior projection* subtriangular in lateral view, shorter than the *ectophallic apodeme*; *pseudepiphallic paramere 1* sclerotized and concave; *pseudepiphallic paramere 2* sclerotized, roughly T-shaped, and adjacent to the *ectophallic dorsal projection*; *ectophallic apodeme* elongated, but not as long as the *endophallus*; *ectophallic arc* sclerotized, inverted V-shaped; *ectophallic dorsal projection* broad, more sclerotized at the center, which is roughly X-shaped; *endophallic posterior portion* sclerotized, curved dorsally, surpassing the apex of *pseudepiphallic arm* in length; *endophallic sclerite* concave and V-shaped; *endophallic apodeme* elongated, surpassing the *ectophallic apodeme* in length.



Figure 3: phallic complex ; A) Dorsal view ; B) Lateral view.

4. Discussion

To date, six species of *Eidmanacris* have been recorded in caves (BOLFARINI et al., 2022). *Eidmanacris* n. sp. represents the seventh cave-dwelling species within the genus, further reinforcing its strong association with subterranean environments. The discovery of this new species highlights the importance of cave faunal inventories, as these surveys are essential for unveiling cryptic biodiversity and informing conservation efforts.

The new species described here is distinguished from its congeners by a unique combination of morphological traits, including the length of the supra-anal plate posterolateral projections, the size and shape of the forewings, and key structural features of the phallic complex, particularly the apex of the *pseudepiphallic arms*, the length and curvature of the *ectophallic apodeme*, the width of the *ectophallic arc*, and the length of the *endophallus*.

Despite these distinguishing characteristics, *Eidmanacris* n. sp. shares certain morphological features with other species within the

genus. Its general coloration is similar to that of *E. speluncae*, *E. melloi* De Campos, 2017, and *E. minuta* (de Mello, 1990), while its forewing length and shape resemble those of *E. multispinosa* Desutter-Grandcolas, 1995, *E. larvaeformis*, and *E. fusca* (DESUTTER-GRANDCOLAS, 1995b; DE CAMPOS et al., 2017). The metanotal gland structure is most similar to that of *E. speluncae*, while the supra-anal plate resembles that of *E. dissimilis* (DESUTTER-GRANDCOLAS, 1995b; DE CAMPOS et al., 2017).

The substantial geographic separation between the cave where *Eidmanacris* n. sp. was discovered and the type localities of its congeners further supports its recognition as a new species. The closest known species, *E. septentrionalis* Desutter-Grandcolas, 1995 and *E. scopula*, occur approximately 700 km and 1,200 km from the type locality of *Eidmanacris* n. sp., respectively (Cigliano et al., 2025). These species are isolated from *Eidmanacris* n. sp. by major geographical barriers, such as the São Francisco River, further corroborating its taxonomic distinctiveness.

5. Conclusion

The description of this new *Eidmanacris* species enhances our understanding of the distribution and diversity of Neotropical Orthoptera. *Eidmanacris* n. sp. is the seventh species of the genus recorded in caves, further reinforcing its strong association with subterranean habitats. The

se findings underscore the importance of caves as suitable environments for *Eidmanacris* and suggest that future surveys in unexplored regions may reveal additional species within the genus, further expanding our knowledge of its diversity and ecological adaptations.

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