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NOTES ON GEOGRAPHIC DISTRIBUTION

First confirmed records of Little Fruit-eating Bat, *Dermanura rava* Miller, 1902 (Chiroptera, Phyllostomidae), from Panama

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Abstract. We confirm the presence of *Dermanura rava* Miller, 1902 in Panama based on two specimens collected in Chagres National Park, whose identification was based mainly on the ventral morphology of the skull, particularly the absence of posterior nares in front of the mesopterygoid fossa. This finding fills an important gap in knowledge about the distribution of the species in Central America and extends its known range approximately 308 km northward to the Panama Canal region.

Key words. Central America, Chagres, cranial morphology, distribution, Stenodermatinae

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Introduction

The small frugivorous bats of the genus *Dermanura* Gervais, 1856 (Chiroptera, Phyllostomidae) represent a taxonomic group diagnosable by their body length of approximately 50 mm, forearm shorter than 43 mm, absence of a tail, and lack of a dorsal stripe (Díaz et al. 2021), as well as bifid upper central incisors (York et al. 2019). The genus comprises 11 species: *D. anderseni* (Osgood, 1916); *D. azteca* (Andersen, 1906); *D. bogotensis* (Andersen, 1906); *D. cinerea* Gervais, 1855; *D. glauca* (Thomas, 1983); *D. gnoma* (Handley, 1987); *D. phaeotis* Miller, 1902; *D. rava* Miller, 1902; *D. rosenbergi* (Thomas, 1897); *D. tolteca* (de Saussure, 1860); and *D. watsoni* (Thomas, 1901) (Solari et al. 2009).

Dermanura rava, commonly known as the Little Fruit-eating Bat, is classified as Least Concern in the IUCN Red List (IUCN 2019). According to Solari (2019a), confirmed records indicate that its distribution currently extends from western Colombia (Chocó Department and the middle and lower valleys of the Cauca and Magdalena rivers), southward along the western slopes of the Andes to southwestern Ecuador and the northwestern tip of Peru (Tumbes Department).

However, although Solari et al. (2009) reported *D. rava* as extending northward into central Panama, their study did not include any verified specimens from the country. As a result, it remains unclear whether this assertion reflects a true range extension or merely arises from the well-documented sympatry between *D. rava* and *D. phaeotis*, two species that can occupy similar ecological niches within the same region (Solari 2019a, 2019b). Moreover, while records attributed to *D. rava* exist for Panama in the Global Biodiversity Information Facility (GBIF) these entries lack robust taxonomic validation, as they are based primarily on photographs from platforms such as iNaturalist rather than on the diagnostic examination of voucher specimens.

In this study, we present the first validated records of *D. rava* from Panama based on the capture of two individuals in the Panama Canal area. These records extend and confirm the distribution of the species into central Panama.

Methods

Data collection. On 4–6 October 2024 between 18:00 and 23:00 hours, bats were captured in the Campo Chagres area of Chagres National Park, Chilíbre District, Panama Province (Figure 1). The

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collections were carried out under the protection of the collection permits (ARG-016-2023) issued by the Ministry of Environment of Panama. The reference specimens were deposited in the mammal collection of the Vertebrate Museum of the University of Panama (MVUP).

Individuals of *D. rava* were identified following the descriptions of Miller (1902), Solari (2019a), and Díaz et al. (2021). Morphometric measurements (in millimeters) were taken using calibrated vernier calipers (range 0–100 mm; accuracy ± 0.05 mm), following García-Herrera et al. (2021). These included maximum skull length, postorbital width, zygomatic width, cranial width, mandibular length, and forearm length. Additional external measurements comprised total length, ear length, tibia length, and hindfoot. Body mass (in grams) was measured using a 60 g spring scale with a precision of 1.0 g.

The morphometric data and taxonomic characters obtained were compared with the information available for *Dermanura phaeotis*, based on the descriptions by Miller (1902), Timm (1985), Solari (2019b), and Díaz et al. (2021).

Results

***Dermanura rava* Miller, 1902**

Figures 2, 3

New record. PANAMA — **Panama** • Chilíbre, Chagres National Park, Campo Chagres; 09°12′29″N, 079°35′54″W; 122 alt.; 5 Oct. 2024; Nelson Guevara, Alexandra Achille & Mallory Salgado leg.; secondary forest; mist nets; skin prepared separately from skull, no organs preserved; the cranial elements lost enamel due to preparation and cleaning with hydrogen peroxide; 2 adults ♂, MVUP-1874, MVUP-1875.

Identification. The specimens were identified as *D. rava* (Figure 1) because, when the skull is placed in ventral view, the posterior nares are not visible, as they open well behind the mesopterygoid fossa (Figure 2). In contrast, in *D. phaeotis*, the posterior narines are visible in the ventral view, in front of the mesopterygoid fossa. Dental formula: I 2/2, C 1/1, P 2/2, M 2/2 (x2) = 28. The dorsal pelage is darker than the ventral and is notably tricolored (Figure 3). Distinct whitish facial stripes are also observed, and ears and noseleaf are light brown, outlined in yellowish cream. Body and cranio-dental measurements are presented in Table 1.

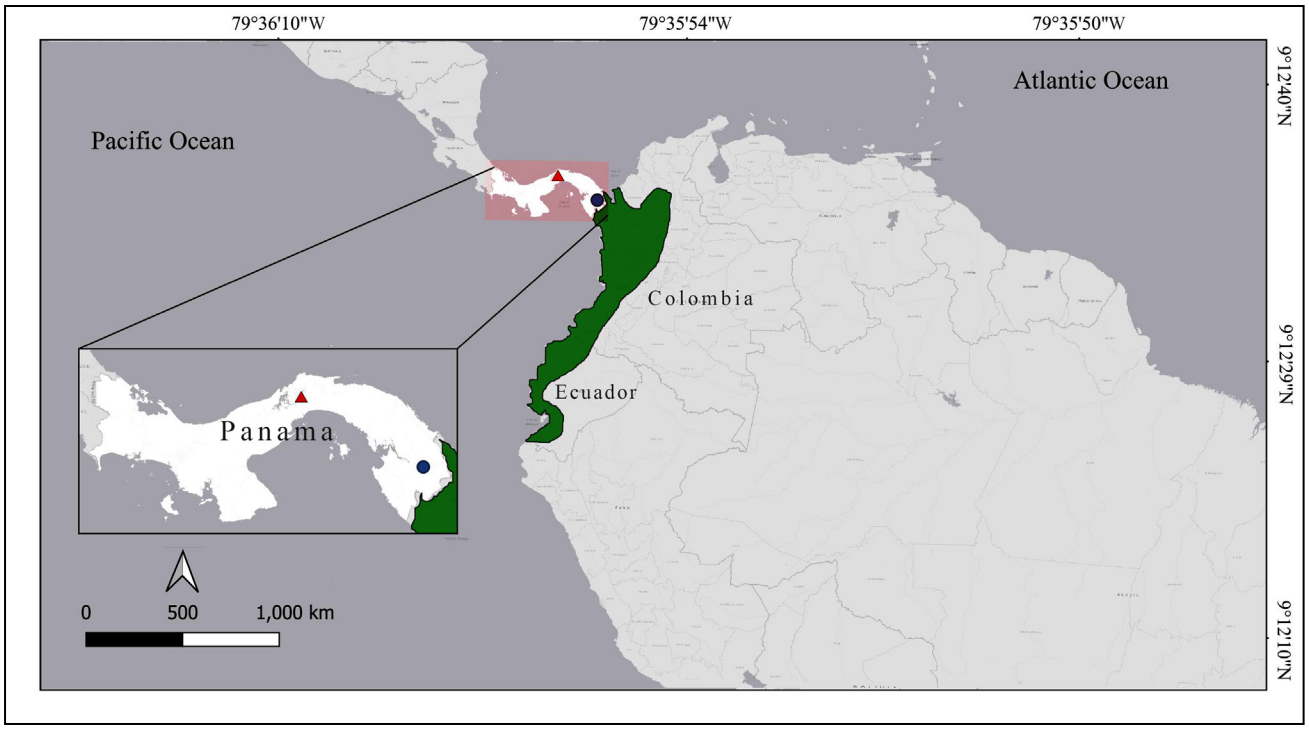

Figure 1. Geographic distribution of *Dermanura rava* in America (shaded green) according to Solari (2019a). First confirmed record in Panama: Campo Chagres, Chagres National Park, Chilíbre, Panama (Red triangle). Unconfirmed record (Yamada et al. 2025), Darien Province (Blue dot).

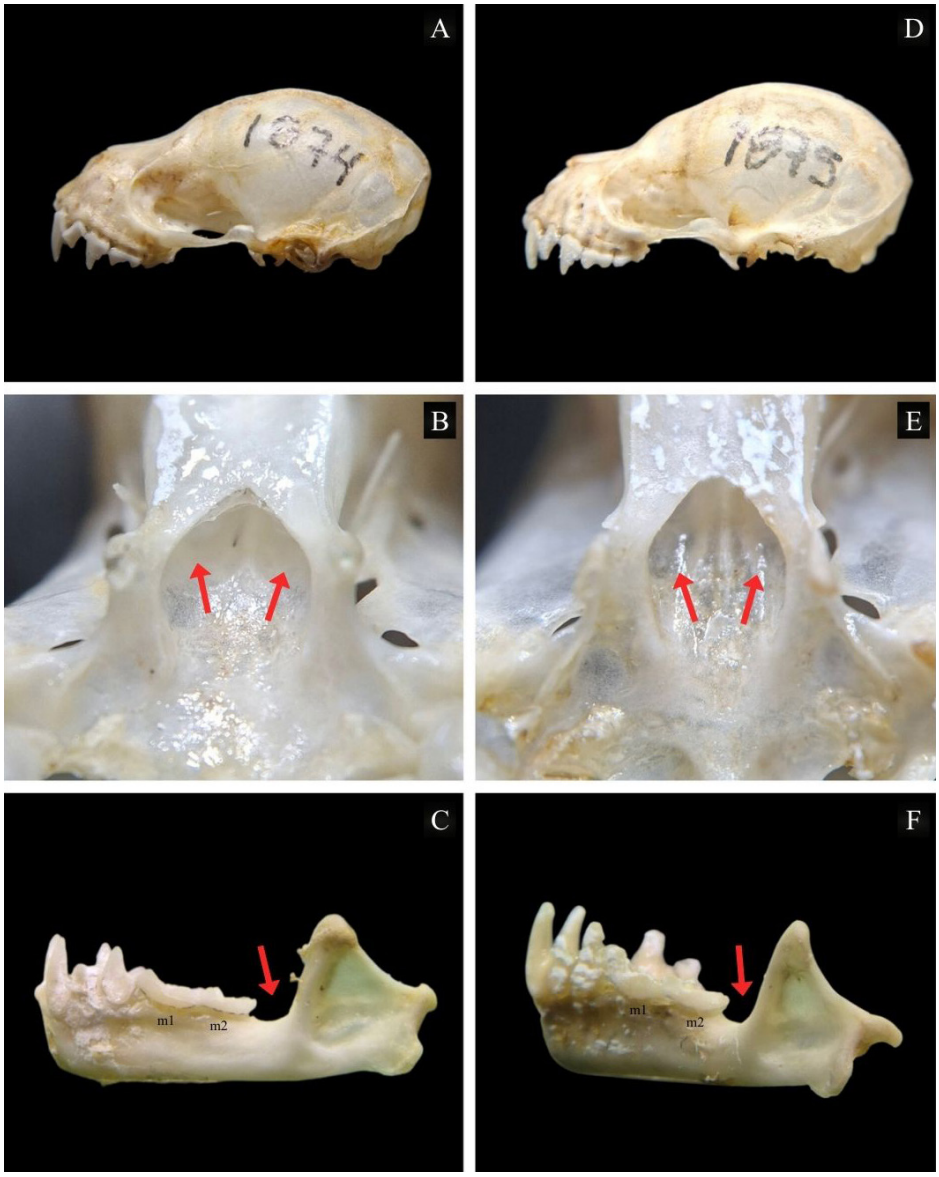

Figure 2. Specimen MVUP-1874 (A, B, and C), specimen MVUP-1875 (D, E, and F). **A–D.** Lateral view of the skull. **B–E.** Ventral view of the skull, posterior nasal cavities not visible in front of the mesopterygoid fossa (indicated by the red arrow). **C–F.** Lateral view of the mandible, absence of lower third molar (m3).

Comments. Other characteristics (see Miller 1902) describe that *D. rava* has a longer palate, while in *D. phaeotis* the dental arches exhibit an almost circular arrangement. However, these may sometimes be subject to interpretation by observers.

Discussion

We confirm the presence of *Dermanura rava* in Panama, as suggested by previous studies (Hoofer et al. 2008; Solari et al. 2009; Hiller et al. 2021). Our records also significantly extend the distribution range of *D. rava* northward by approximately 308 km from its nearest known locality in Chocó Department, Colombia (Solari 2019a). Collaborative research between the University of New Mexico Museum and the Gorgas Memorial Institute in Panama records the presence of *D. rava* in the province of Darién in its internal databases (Figure 1; Yamada et al. 2025). These records come from studies focused on the surveillance of viral agents in small mammals and lack a taxonomic evaluation of the bat specimens.

It should be noted that the study by Yamada et al. (2025) mentioned the molecular identification of species, with sequences deposited in GenBank. However, the only sequences currently available are to *Carollia perspicillata* and *Saccopteryx bilineata*; no molecular data are available for the other species. Consequently, obtaining and depositing sequences for these species is a priority line of research for future taxonomic confirmation.

Figure 3. Preserved specimens: clearly tricolored dorsal coat. Note the contrast between the basal and terminal bands in the coat, marked by numbers 1, 2, and 3. **A–C.** Specimen MVUP-1874. **A–D.** MVUP-1875.

Table 1. Body and craniodental morphometric measurements of *Dermanura rava* specimens reported in Campo Chagres, Panama. Comparative measurements.

Measurements	***D. rava***				***D. phaeotis***	
	This study		**Solari (2019a)**	**Miller (1902)**	**Timm (1985)**	**Solari (2019b)**
	(MVUP-1874)	**(MVUP-1875)**				
Mass (g)	15	14	10–17	—	8–15	8.0–15
Body (mm)						
Forearm length	40	40	37–42	36	35–41	35–41
Total length	56	53	44–62	55	51–60	51–60
Ear	13	14	11–17	14	14–18	14–18
Tibia	9	10	—	14	—	—
Hindfoot	11	12	9–14	9	8–12	8–12
Cranio-dental (mm)						
Greatest length of skull	19.5	19.4	—	20	19.0	—
Postorbital breadth	4.5	4.5	—	—	5.0	—
Zygomatic breadth	12.4	11.8	—	12	11.6	—
Braincase breadth	9.1	9.1	—	—	—	—
Mandible	13.2	12.5	—	13	—	—

The sporadic mention of *D. rava* in Panama by some authors, such as Hoofer et al. (2008) and Diaz et al. (2021) may be associated with the observation by Solari et al. (2009) that within the genus *Dermanura*, only two species *D. rava* and *D. phaeotis* cross the geopolitical boundary between Central and South America. Nevertheless, the absence of museum specimens, particularly in national collections, has led several authors, such as Solari (2019a) to exclude its presence in Panama. This reinforces the importance of collecting and depositing specimens in scientific collections, as well as the need for their continuous revision (Moratelli 2014). Furthermore, our records come from the eastern part of the country, and its presence in the western region of Panama should be addressed in future studies. With this new record and considering the species mentioned by Wilson and Mittermeier (2019) from the region, Panama now has approximately 115 confirmed bat species in its territory.

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Additional information

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: NG, BV, MS. Data curation: NG, AA, EM. Formal analysis: MS, AA, NG, BV. Funding acquisition: NG, BV, AA, MS, EM, YC, AC. Investigation: NG, BV, AA, MS, EM, YC, AC. Methodology: NG, AA. Resources: NG, YC, AC. Supervision: NG, AA, BV. Visualization: NG, BV, MS. Project administration: NG, AA. Software: BV, MS. Validation: NG, BV, MS. Writing – original draft: NG, EM, AA. Writing – review and editing: MS, NG, BV.

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Data availability

All data that support the findings of this study are available in the main text.

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