



### DISTRIBUTION IN PANAMA OF *Actinopus robustus* (O. Pickard-Cambridge, 1892) (ARANEAE - ACTINOPODIDAE): BEYOND THE TYPE LOCALITY

### DISTRIBUCIÓN EN PANAMÁ DE *Actinopus robustus* (O. Pickard-Cambridge, 1892) (ARANEAE - ACTINOPODIDAE): MÁS ALLÁ DE LA LOCALIDAD TIPO

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**ABSTRACT.** An actualization of the known distribution of *Actinopus robustus* (O. Pickard-Cabridge, 1892) within Panama is reported for first time using museum samples stored at the G. B. Fairchild Invertebrate Museum of the Universidad de Panamá. A total of five new localities is reported, together with the possible location at La Palma, in the province of Darien.

**KEYWORDS:** Mygalomorphae, Trapdoor spider, Distribution Pattern, Morphology, Panama.

**RESUMEN.** Se reporta la distribución actualizada de *Actinopus robustus* (O. Pickard-Cabridge, 1892) dentro de Panamá por primera vez, utilizando muestras de museo almacenadas en la colección del Museo de Invertebrados G. B. Fairchild de la Universidad de Panamá. Un total de cinco nuevas localidades son reportadas, junto la posible localidad en La Palma, provincia de Darién.

**PALABRAS CLAVE:** Migalomorfos, Arañas de Puerta-trampa, patrones de distribución, Morfología, Panamá.

#### INTRODUCTION

The genus *Actinopus* Perty, 1833 (Actinopodidae) comprises 97 accepted species widely distributed in Central and South America. The greatest diversity of the genus is found in Brazil and Argentina, about 80% of the species have been described for these two countries (World Spider Catalog, 2024).

The members of this genus, commonly known as mouse spiders (Sherwood et al., 2023), create underground burrows protected by a robust trapdoor,



internally covered with a combination of silk and soil. The cover is linked by means of a silk hinge, typically situated at the upper part of the door, allowing the door to close under its own weight, thus sealing the entrance to the burrow (Ríos-Tamayo & Goloboff, 2018).

The northernmost of the Americas *Actinopus* Party, 1833 have been reported is Panama, where one species has been recorded, *Actinopus robustus* (O. Pickard-Cambridge, 1892). The type locality reported by O. Pickard-Cambridge when the species was described is the province of Veraguas in the central zone of the country (O. Pickard-Cambridge, 1892). Later it was reported that the species is also found in the province of Coclé, at Rio Hato and Anton (Quintero, 2005), and in the province of Panama, Ancón (Miglio et al., 2020).

The aim of this work is to disclose the distribution of *A. robustus* (O. Pickard-Cambridge, 1892) in Panama using museum samples collected through the years.

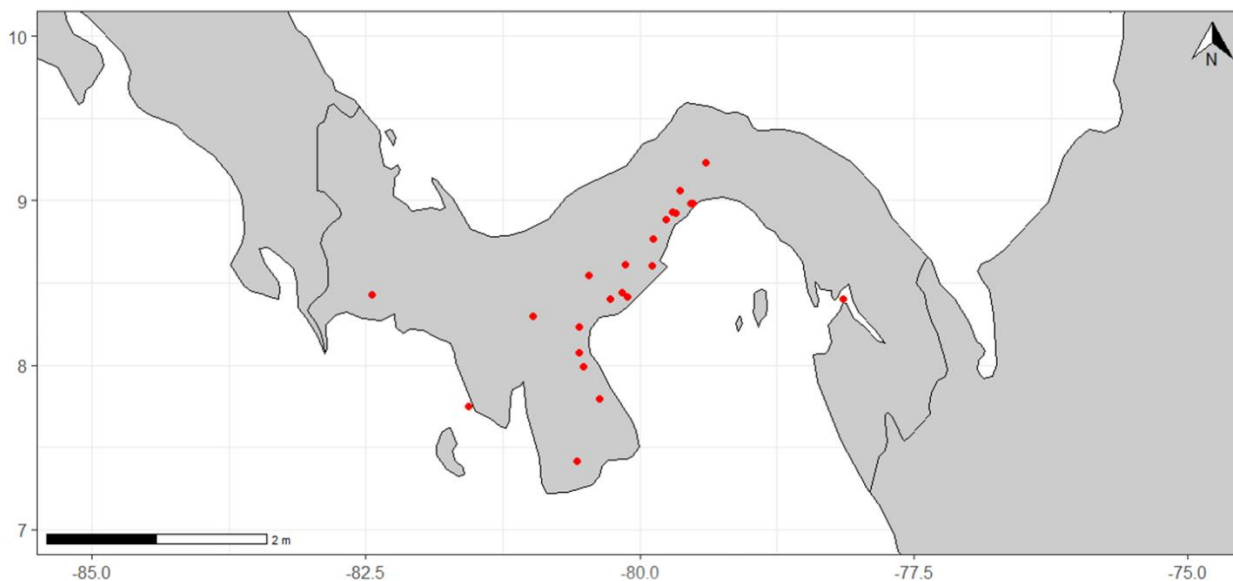
## METODOLOGY

Material examined is deposited at the Collection of Venomous Arthropods, Museo de Invertebrados de la Universidad de Panamá (MIUP), G. B. Fairchild (Curator: Roberto Cambra).

A collection of 621 specimens was reviewed, each sample or group of samples was carefully evaluated, catalogued, and the information on the tags was digitized on an online document, taking notes of locality of collection, sex, and so on.

The photos of the specimens were taken using a CMOS digital camera adapted to a Leica stereomicroscope S9i LED2500 with the software Leica Application Suite X. Images were organized in plates using photoshop CS6 software.

The map of recorded distribution of the species in Panama was developed using R software (Fig. 1).



**Figure 1.** Map showing the records of *A. robustus* (O. Pickard-Cambridge, 1892). Data taken from the museum samples from MIUP G. B. Fairchild, Panamá

## RESULTS.

### *Actinopus robustus* (O. Pickard-Cambridge, 1892)

Figure 2.

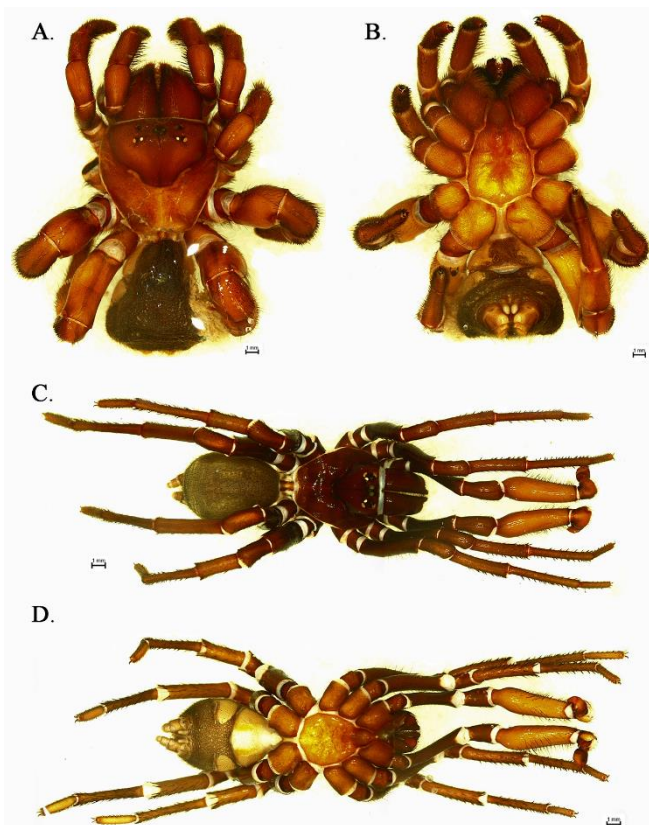
**Type material.** Veraguas, Panama (O. Pickard-Cambridge, 1892).

**Species Records.** PANAMA – **Coclé-** Río Hato; 8.44166, -80.16443; 6-25.X.1983; M. Guardia leg.; with ocular malformations; 2 ♀; MIUP-LAV-ARACT03. El Valle de Antón; 8.40304, -80.27473; 24.X.1977; M. Guardia leg.; One of the females has ocular malformations; 2 ♀; MIUP-LAV-ARACT11. Penonomé; 8.54853, -80.46310; 1.V.2014; D. Quintero leg.; Pitfall; 1♂; MIUP-LAV-ARACT14. **Herrera-**París; 8.07872, -80.55495; 19.I.1980; M. Guardia leg.; MIUP-LAV-ARACT19. Parita; 7.99118, -80.51592; 26.I.1980; M. Guardia leg.; MIUP-LAV-ARACT20. **Chiriquí-** David; 8.42758, -82.44333; 7.III.2011; D. Quintero leg.; 1♂; MIUP-LAV-ARACT21. **Los Santos-** Reserva Forestal La Tronosa; 7.41882, -80.57154; 3-6.V.2006; D. Quintero leg.; 1♀; MIUP-LAV-ARACT22. Guararé; 7.79570, -80.36548; 16.IX.2006; R. J. Miranda leg.; 1♀, 2 inmaturs; MIUP-LAV-ARACT23. **Veraguas-** Carabali; 8.29758, -80.97802; 24-25.III.2005; D. Quintero leg.; 1♀; MIUP-LAV-ARACT24. Bahía Honda; 7.75076, -81.56341; 7-18.XII.2001; R. J. Miranda leg.; 1♀; MIUP-LAV-ARACT25. **Panamá Oeste-** Capira; 8.76518, -79.87446; 12.IV.2015; D. Quintero leg.; 1♂; MIUP-LAV-ARACT27. Arraiján; 8.92998, -79.70054; 31.III.1982; M. Guardia leg.; 1♀; MIUP-LAV-ARACT28. Cerro Silvestre; 8.9268, -79.67249; 30.IV.2005; R. J. Miranda leg.; 1♂; MIUP-LAV-ARACT29. Chorrera; 8.88686, -79.76345; 1.II.1988; E. Santos leg.; 2♀, 3 Inmaturs; MIUP-LAV-ARACT30. **Panamá-** Ciudad de Panamá; 8.98348, -79.52164; 28.IV.1994; R. J. Miranda leg.; 1♂; MIUP-LAV-ARACT32. Universidad de Panamá; 8.98355, -79.53364; 3.V.1980; D. Quintero leg.; 1♂; MIUP-LAV-ARACT36.

**Identification.** Specimens were confirmed following the diagnosis criteria of Miglio et al., 2020, for *A. robustus*.

**Comments.** We included a specimen collected in the province of Darién by José Hernández; the general morphology corresponds to *A. robustus* (O. Pickard-

Cambridge, 1892), but is still to be confirmed. Specimens with incomplete information about collection dates, sex, or any other criteria were not listed above, but are included in Table 1. Also were not listed above specimens with the same collection locality but in different dates.



**Figure 2.** *A. robustus* (O. Pickard-Cambridge, 1892). A, female from Los Santos, Reserva Forestal la Tronosa, dorsal; B, ventral; C, Male from Chiriquí, David, dorsal; D, ventral.

## DISCUSION.

*Actinopus robustus* (O. Pickard-Cambridge, 1892) have been reported by several authors to be at least in two localities in Panama (Quintero, 2005; Miglio et al., 2020; Sherwood et al., 2023). In this work it is presented the non-reported localities of *A. robustus* deposited in the venomous arthropods reference collection of the Invertebrate Museum G. B. Fairchild of the Universidad de Panamá.

In Panama, the genus *Actinopus* is only represented by one species, which is widely distributed along the country (Fig 1.). It seems the general distribution of the



species is towards the Pacific side. This could be explained by assuming a lack of sampling in other regions of Panama. Recently samples suspected to be *A. robustus* were collected in the province of Darien, which could support the hypothesis of a poor sampling. However, the specimen is yet to be confirmed as *A. robustus* or another species from south America.

Most data from the museum samples were collected in the province of Coclé and Panamá, allowing to think is a common species in these areas, as mentioned by Quintero (2005). *A. robustus* prefers compacted clay

soils, quite common in the areas where it was found (Quintero, 2005)

Museum collections like the one in G. B. Fairchild Invertebrate Museum of the Universidad de Panamá, are important information reservoir, allowing to understand distribution of species, in this case of a species, through time, and give light to possible distribution patterns.

Although the records stored in the museum's collection are numerous, there is still work to be done to understand the biology, applications and the real distribution pattern of this species in Panama.

**Table 1.** Record of specimens from MIUP G. B. Fairchild of *A. robustus* (O. Pickard-Cambridge, 1892) from Panama.

# Specimen	Sex	MIUP Code	Locality	Latitude	Longitude
156	N/D	MIUP-LAV-ARACT01	Río Hato, Coclé	8.44166	-80.16443
1	Female	MIUP-LAV-ARACT02	Río Hato, Coclé	8.44166	-80.16443
2	Female	MIUP-LAV-ARACT03	Río Hato, Coclé	8.44166	-80.16443
1	Female	MIUP-LAV-ARACT04	Río Hato, Coclé	8.44166	-80.16443
15	N/D	MIUP-LAV-ARACT05	Río Hato, Coclé	8.44166	-80.16443
3	N/D	MIUP-LAV-ARACT06	Río Hato, Coclé	8.44166	-80.16443
2	N/D	MIUP-LAV-ARACT07	Río Hato, Coclé	8.44166	-80.16443
238	N/D	MIUP-LAV-ARACT08	Río Hato, Coclé	8.44166	-80.16443
10	N/D	MIUP-LAV-ARACT09	Antón, Coclé	8.40304	-80.27473
1	N/D	MIUP-LAV-ARACT10	Valle de Antón, Coclé	8.60979	-80.13342
2	Female	MIUP-LAV-ARACT11	Antón, Coclé	8.40304	-80.27473
1	N/D	MIUP-LAV-ARACT12	Antón, Coclé	8.40304	-80.27473
91	N/D	MIUP-LAV-ARACT13	Río Hato, Coclé	8.44166	-80.16443
1	Male	MIUP-LAV-ARACT14	Penonomé, Coclé	8.54853	-80.46310
1	N/D	MIUP-LAV-ARACT15	Antón, Coclé	8.40304	-80.27473
4	N/D	MIUP-LAV-ARACT16	Antón, Coclé	8.40304	-80.27473
20	N/D	MIUP-LAV-ARACT17	Río Hato, Coclé	8.44166	-80.16443
16	N/D	MIUP-LAV-ARACT18	Aguadulce, Coclé	8.22989	-80.55661
7	N/D	MIUP-LAV-ARACT19	París, Herrera	8.07872	-80.55495
1	N/D	MIUP-LAV-ARACT20	Parita, Herrera	7.99118	-80.51592
1	Male	MIUP-LAV-ARACT21	David, Chiriquí	8.42758	-82.44333
1	Female	MIUP-LAV-ARACT22	Reserva Forestal La Tronosa, Los Santos	7.41882	-80.57154
3	Female, Inmat.	MIUP-LAV-ARACT23	Guararé, Los Santos	7.79570	-80.36548
1	Female	MIUP-LAV-ARACT24	Carabali, Road to Santa Fe, Veraguas	8.29758	-80.97802
1	Female	MIUP-LAV-ARACT25	Bahía Honda, Islas Canales de Tierra, Veraguas	7.75076	-81.56340
1	N/D	MIUP-LAV-ARACT26	Arraiján, Cerro Silvestre, Panamá Oeste	8.92680	-79.67249
1	Male	MIUP-LAV-ARACT27	Capira, Río Capira, Panamá Oeste	8.76518	-79.87446
1	Female	MIUP-LAV-ARACT28	Vista Alegre, Arraiján, Panamá Oeste	8.92998	-79.70053
1	Male	MIUP-LAV-ARACT29	Arraiján, Cerro Silvestre, Panamá Oeste	8.92680	-79.67249
5	Female, Immat.	MIUP-LAV-ARACT30	Chorrera, Panamá Oeste	8.88686	-79.76345
8	N/D	MIUP-LAV-ARACT31	Bejuco, Chame, Panamá Oeste	8.60610	-79.88923
1	Male	MIUP-LAV-ARACT32	Ciudad de Panama, Panamá	8.98348	-79.52164
1	Male	MIUP-LAV-ARACT33	Universidad de Panamá, Panamá	8.98355	-79.53364
1	Male	MIUP-LAV-ARACT34	Universidad de Panamá, Panamá	8.98355	-79.53364
1	Male	MIUP-LAV-ARACT35	Ciudad de Panama, Panamá	8.98348	-79.52164



1	Male	MIUP-LAV-ARACT36	Universidad de Panamá, Panamá	8.98355	-79.53364
3	Male	MIUP-LAV-ARACT37	Ciudad de Panama, Panamá	8.98348	-79.52164
1	Male	MIUP-LAV-ARACT38	Universidad de Panamá, Panamá	8.98355	-79.53364
1	Male	MIUP-LAV-ARACT39	Universidad de Panamá, Panamá	8.98355	-79.53364
1	Male	MIUP-LAV-ARACT40	Universidad de Panamá, Panamá	8.98355	-79.53364
1	N/D	MIUP-LAV-ARACT41	Universidad de Panamá, Panamá	8.98355	-79.53364
10	N/D	MIUP-LAV-ARACT42	Cerro Azul, Panamá	9.23346	-79.40231
2	Female	MIUP-LAV-ARACT43	Ciudad de Panama, Panamá	8.98348	-79.52164

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### Declaration of Conflicting Interests

The author(s) declared no conflicts of interest with respect to the research, authorship, and/or publication of this article.