

## Scientific Note

**Potential distribution and new records of *Mastophora gasteracanthoides* (Nicolet) (Arachnida: Araneae) in Chile**

Nuevos registros y distribución potencial de *Mastophora gasteracanthoides* (Nicolet) (Arachnida: Araneae) en Chile

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**Abstract.** The known distribution for the species *Mastophora gasteracanthoides* to the north of Chile is widened. A brief redescription to recognize the species and information about natural history are given. Finally, with the new records we evaluated the potential distribution of this species in the country.

**Key words:** Atacama Desert, new records, spiders.

**Resumen.** Se amplía la distribución conocida para la especie *Mastophora gasteracanthoides* hacia el norte de Chile. Se entrega una breve redescrípción para reconocer a la especie e información acerca de su historia natural. Finalmente, con los nuevos registros evaluamos la distribución potencial de esta especie en el país.

**Palabras clave:** Desierto de Atacama, nuevos registros, arañas.

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The genus *Mastophora* (Holmberg, 1876) is represented by 49 described species in the Americas (World Spider Catalog 2018). This genus comprises a small group of spiders that are notable for their curiously formed and sculptured bodies (Gerstch 1955; Levi 2003). The carapace is surmounted by conspicuous spines and the abdomen is provided with some humps and lobes (Gertsch 1955). Using a typical web to capture prey, the adult female of *Mastophora* spiders swing a droplet of adhesive on a thread at flying insects (Eberhard 1980; Yeagan 1988). Interestingly, all species are cryptic and have low densities in the field (Levi 2003).

There is only one species from Chile: *Mastophora gasteracanthoides* (Nicolet, 1849) and is commonly called as "cat head spider" because of the resemblance of its abdomen to the head of a cat (Porter 1918; Gertsch 1955). Other similar species like *Mastophora escomeli* Levi, 2003 and *Mastophora dizzydeani* Eberhard, 1981 are found in the South of Peru, but they differ in size as well as in the form of their genitalia (Levi 2003).

In Chile, *M. gasteracanthoides* is distributed from La Serena (29°54'S, 71°15'W) to Chillán (36°36'S, 72°7'W) in central Chile (Levi 2003), and it has never been reported in the northern

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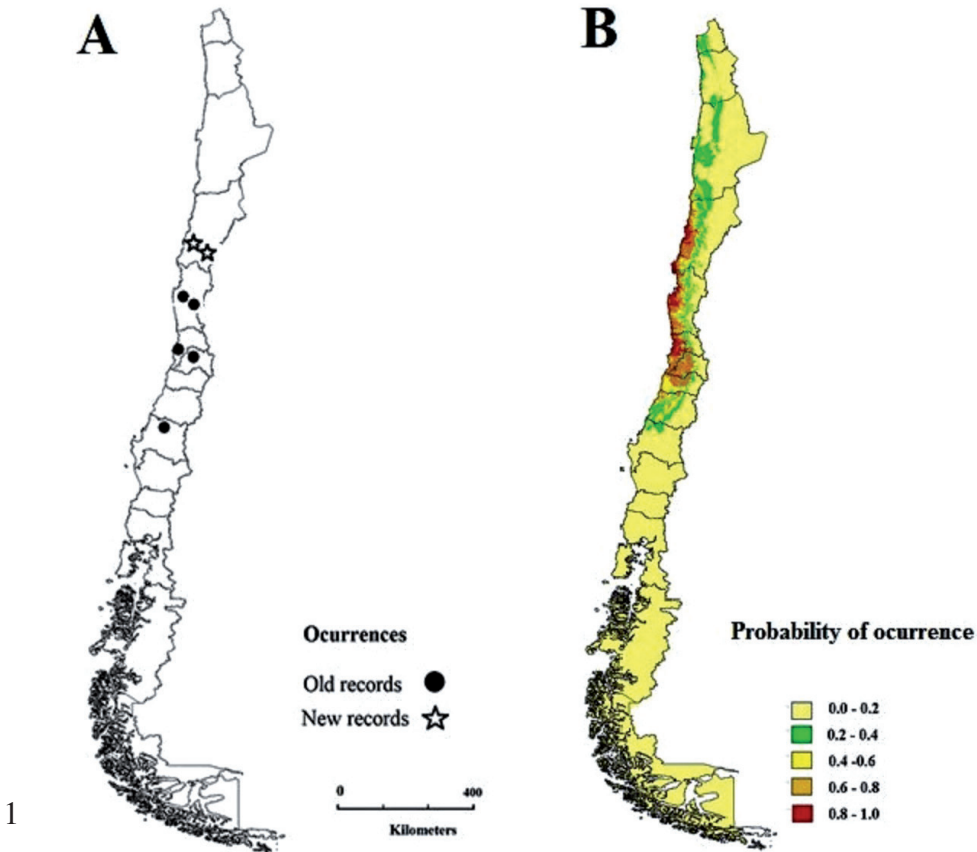
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portion of the country. The present note aims to report the expansion of the distribution of *M. gasteracanthoides* northwards, and the first record in the Atacama Desert. This new finding extends the range of distribution to the north in approximately 300 kilometers from La Serena, being the northernmost collection of this species in Chile (Fig. 1A).

We collected an adult female of *M. gasteracanthoides* in a xerophytic scrub in the Atacama region, northern Chile. We complement our finding with a review of museum material (MNHN; curator: Mario Elgueta, Santiago). Species identification was based on Levi (2003). The specimens collected were preserved in 90% alcohol and are deposited in Museo Nacional de Historia Natural, Santiago, Chile.

To model the potential distribution of *M. gasteracanthoides* we used a total of 11 occurrences provided by our study and from published literature (Archer 1963; Levi 2003). The geographic range was modeled with Maxent Version 3.3.4 (Phillips *et al.* 2009). We used 75% of the occurrence points to generate the potential distribution model; 25% were used for model validation (Phillips *et al.* 2006). A preliminary analysis was made with 19 variables to determine the variables of greatest contribution, and then the final model with these variables was generated. We used eight climatic variables to model the potential distribution. Temperature variables: Alt = altitude; Bio 2 = Mean Diurnal Range; Bio 5 = Max Temperature of Warmest Month; Bio 9 = Mean Temperature of Driest Quarter; Bio 10 = Mean Temperature of Warmest Quarter. Precipitation variables: Bio 14 = Precipitation of Driest Month; Bio 15 = Precipitation Seasonality; Bio 18 = Precipitation of Warmest Quarter.



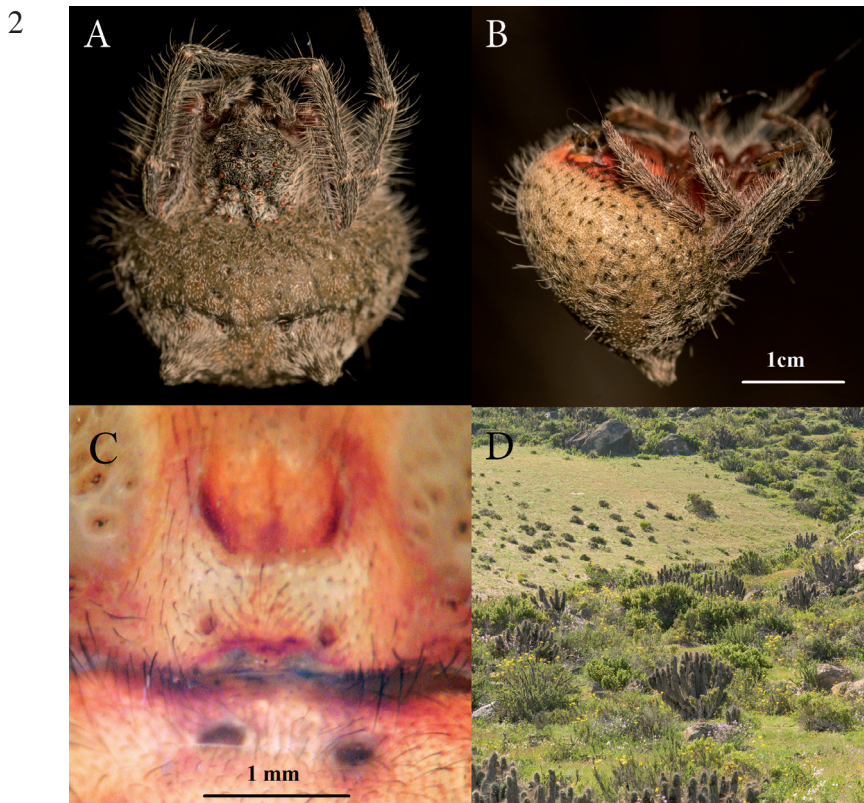
Figures 1A-1B. A. New collections of *M. gasteracanthoides* and previous records in Chile (Levi 2003). B. Potential distribution of *M. gasteracanthoides* considering all known records.

*Mastophora gasteracanthoides* (Nicolet, 1849)  
(Figs. 1A-B, 2A, 2B)

**Redescription.** Females of this species are characterized by a brown cephalothorax with many small red tubercles. The abdomen is brownish with some asymmetrical darker patches and higher humps (Figs. 2A-B). Females of *M. gasteracanthoides* differ from other species by having the atria show as dark spots in the posterior slope of the depression in the epigynum (Fig. C). The epigynum is different from Peruvian species like *Mastophora escomeli* Levi, 2003 and *Mastophora dizzydeani* (Eberhard, 1981) that have a t-shape on their genital plate (see Levi 2003).

**Material examined.** Chile. Santiago, Ñuñoa (33°27'S, 70°40'W), Metropolitan Region, 1-I-1993, 1♀ (MNHN); Santiago, Metropolitan Region, Quinta Normal, 10-XI-1983, 2 ♀ with two egg sacs in apricot plantations, L. Pérez leg. (MNHN). **New records:** Chile. Atacama Region, Altos del Carmen (28°56' 0.8" S, 70° 27' 44.2" W), 10-VII-1982, 1♀, P. Cid leg. (MNHN); Road to Llanos de Challe (28°11'S, 71°8'W), 27-VIII-2017, 1♀, during a flowering desert phenomenon, in the Atacama Region. P. Cerpa leg.

**Potential distribution.** Precipitation of driest month and altitude were the most important environmental variables for the final model (Table 1). High probabilities of occurrence in low-altitude and coastal environments were found. The highest climatic suitability for this species were found from the coast of the third region to the central zone of Chile (Fig. 1B). In this scenario, the greater environmental heterogeneity and vegetational diversity of central Chile would promote the presence of this species in central provinces of the country.



**Figures 2.** Live *M. gasteracanthoides* female. A. Dorsal view of the female. B. Lateral view of the same specimen. C. Epigynum, ventral view. D. Habitat where the spider was found (Photography: Patrich Cerpa).

**Table 1.** Relative contribution of the environmental variables of the Maxent models. The values shown are the averages of the 50 replicates.

Variables	Percent contribution (%)
Bio14	31.6
Alt	19.7
Bio9	18.8
Bio5	15.7
Bio15	7.6
Bio18	3.5
Bio2	0.8

**Habitat, distribution and natural history.** The female was found at 22:32 hrs. Located between two “copaos” (*Eulychnia acida* Philippi, 1864), in a brook, suspended in a silk thread at 1.4 meters high. The surrounding vegetation was composed of *Encelia canescens* (Lamarck, 1786), *Cistanthe cachelensis* (Phil.) Peralta & D.I. Ford and *Balbisia peduncularis* (Lindl.) D. Don (Fig. D). No dams or predatory activity was observed, although this could have been developed and stopped due to direct observation. However, great activity of nocturnal Lepidoptera was observed at the time of the record. It was always found at night (i.e. nocturnal activity) suspended at the center of a thread, in hunting position. There is a tendency for the species to live in similar habitats, where low xerophytes are ideal places to camouflage and trap their prey. This species live in habitats where low xerophytes are ideal places to camouflage and trap their prey. Alternatively, they have also been seen in plantations of fruit in the central provinces of the country. Based on the niche modeling, we can point out that *M. gasteracanthoides* is distributed from the third region in the north to the central provinces of Chile. The low presence of this species in the south of Chile can be associated with an adverse effect of low temperatures and high precipitations. “The Atacama Desert is an important area of endemism for arthropods in this country (Pizarro-Araya y Flores 2004; Cepeda-Pizarro *et al.* 2005). This new records highlights the importance of this region for biodiversity and the lack of knowledge that exists about the spiders present in deserted environments of northern Chile”.

The region studied is a major area of endemism for restrictedly distribute arthropods in this country (Pizarro-Araya y Flores 2004; Cepeda-Pizarro *et al.* 2005). This record highlights the importance of this region for biodiversity and the lack of knowledge that exists about the spiders present in deserted environments of northern Chile.

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