

Research Article

A new species of *Loxosceles* Heineken & Lowe, 1832 (Araneae: Sicariidae) from Chile

Una nueva especie de *Loxosceles* Heineken y Lowe, 1832 (Araneae: Sicariidae) de Chile

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Abstract. A new species of *Loxosceles* of the *laeta* species-group, *L. vicentei* **sp. nov.**, found in Chile is described and illustrated. The male of this species can be distinguished from that of other species by having a long and straight embolus with a truncated tip. The female is distinguished by the spermatheca with a large base and two slender, curved receptacles in both sides.

Key words: Chilean recluse spider; desert; endemism; *laeta* species-group; medically-important spider.

Resumen. Una nueva especie del género *Loxosceles* del grupo de especies *laeta*, *L. vicentei* **sp. nov.**, encontrada en Chile es descrita e ilustrada. El macho de esta especie se puede distinguir del de otras especies por tener un embolo largo, recto y con la punta truncada. La hembra se distingue por la espermateca con base grande y dos receptáculos delgados y curvos en ambos lados.

Palabras clave: Araña de importancia médica; araña reclusa chilena; desierto; endemismo; grupo *laeta*.

Introduction

Spiders of the genus *Loxosceles* Heineken & Lowe, 1832 are potentially hazardous to human health. All *Loxosceles* species with tested venoms cause dermonecrotic lesions by their envenomation (Schenone *et al.* 1989; Vetter & Rush 2002; Valdez-Mondragón *et al.* 2018). These spiders are distributed all over the world, especially in South and North Africa, South and North America, Mediterranean, several regions of Asia and have been introduced in several European countries, in addition to Australia (Gertsch 1967; Palmgren 1977; Harvey 1996; Brescovit *et al.* 2017).

According to Gertsch (1967) and Binford *et al.* (2008), species of *Loxosceles* are classified into eight species-groups: *reclusa*, *laeta*, *amazonica*, *gaucho*, *spadicea*, *rufescens*, *vonwredei* and *spinulosa*. In South America, the *laeta* group has the highest diversity, with 25 species distributed in Ecuador, Colombia, Peru, northern Chile, Argentina and southern Brazil (Gertsch 1967; Taucare-Ríos 2011; Cala-Riquelme *et al.* 2015; Brescovit *et al.* 2017; Taucare-Ríos & Piel 2021). According to Gertsch (1967) the *laeta* species-group is characterized by the

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male palp with tibia at least twice as long as cymbium and embolus longer than diameter of bulb, females with tubular spermathecae closely positioned and the leg formula 4213 (Gertsch 1967).

Recently it has been documented that in Chile there are six species of the genus *Loxosceles* that preferably inhabit arid and semi-arid environments, and only one is strongly synanthropic: *Loxosceles laeta* (Nicolet, 1849) (Taucare-Ríos 2011; Brescovit *et al.* 2017; Taucare-Ríos & Piel 2021). Another characteristic of this group in Chile is the restricted distribution of endemic species as *L. coquimbo* (Gertsch, 1967), *L. pallalla* Brescovit, Taucare-Ríos, Magalhaes & Santos, 2017, *L. diaguita* Brescovit, Taucare-Ríos, Magalhaes & Santos, 2017 and *L. vallenar* Brescovit, Taucare-Ríos, Magalhaes & Santos, 2017, since these spiders have a low dispersal capacity unlike the widely distributed *L. laeta* (Brescovit *et al.* 2017).

Despite the recent review of the *Loxosceles* species in Chile, a new species from *laeta* species-group is presented here, showing that probably the diversity of the genus is greater than we know. This new Chilean recluse spider was collected in the semi-arid environments of Chile situated in Atacama and Coquimbo regions.

Material and Methods

Terminology and format of descriptions follow Brescovit *et al.* (2017). Photos were taken with a Nikon S3700 digital camera adapted to a Leica M205C stereoscopic microscope. Lengths of palp and leg segments are according to the following format: femur, patella, tibia, metatarsus (missing on palp), tarsus (total). All measurements are in millimeters. Photographs were edited using PhotoScape 3.7. The genitalia were dissected in ethanol (95%). The female genitalia were cleaned in potassium hydroxide (KOH 10%) for 10 minutes following Valdez-Mondragón *et al.* (2018) protocol. The treated copulatory organ of the female and male have been stored inside the holotype and paratype tube, respectively. Geographical coordinates were obtained during our collection, using a GPS (Garmin gpsmap65). The map was created using the software ArgcMap 10.3.

Male and female specimens of *Loxosceles coquimbo* were used for comparison, through specimens deposited in the AMNH and LEULS collections.

Abbreviations used in the text. Specimens of *Loxosceles* examined in support of this study were sourced from the following collections (curators in parentheses):

AMNH: American Museum of Natural History, New York, U.S.A. (L. Prendini); LEULS: Laboratorio de Entomología de la Universidad de La Serena, La Serena, Chile (J. Pizarro-Araya); MNHNCL: Museo Nacional de Historia Natural, Área de Entomología, Colección Nacional de Arachnida, Santiago, Chile (M. Elgueta).

Abbreviations in the description: ALE = anterior lateral eye, PLE = posterior lateral eye, PME = posterior median eye.

Results

Taxonomy

Family Sicariidae Keyserling, 1880

Genus *Loxosceles* Heineken & Lowe, 1832

Loxosceles vicentei **sp. nov.**
(Figs. 1A-B, 2A-D, 3, 4 A-B, 5)

Diagnosis. *Loxosceles vicentei* sp. nov. can be confused in Chile only with *L. coquimbo*, but can be distinguished by the presence of dark-brown spots on carapace (Figs. 1A-B). The male resembles *L. coquimbo* by its palp with a globose bulb, but differs by having a long embolus, straight with a truncated tip (Figs. 2 A-C), while in *L. coquimbo* the embolus is short and sinuous at tip; in other species of *laeta* species-group such as *L. laeta* and *L. surca* Gertsch, 1967 the embolus is slender and curved. In *L. vicentei* sp. nov. the male palpal tibia is shorter (1.5 long, 0.6 wide) (Figs. 2 A-B) than in *L. coquimbo* (2.1 long, 0.5 wide). The females can be distinguished from other Chilean species by the spermatheca with large base and two slender, curved receptacles in both sides. The seminal receptacles of females of *L. vicentei* sp. nov. and *L. coquimbo* are similar, however in the new species the distance between the base of the receptacles is larger (1.3 times) than in *L. coquimbo* (Fig. 2D).

Etymology. The specific name is a patronymic for Vicente Villablanca, son of Javier Villablanca and the collector of the type material.

Type material. Holotype male (MNHCL 8371): Chile, IV Región de Coquimbo, Vicuña, Fundo el Calvario, near to Juntas del Toro, 29°58'30.97"S 70°6'11.86"W, 2,050 m a.s.l, manual collecting under rocks, 14 October 2021, V. Villablanca Miranda, J. Villablanca Rivera & A. Taucare-Ríos leg. **Paratypes.** Chile: 1 female (LEULS 003), 2 males (LEULS 004), same locality, date and collectors as holotype.

Additional material examined: 1 female and 4 immatures, same collection data as for holotype (MNHCL 8372); 1 immature, 14 November 2019, same locality of holotype, J. Villablanca Rivera & V. Villablanca Miranda leg. (MNHCL 8373). III Región de Atacama, Copiapó, 27°17'58.91"S 70°23'6.08"W, 340 m a.s.l, 2 females, collected under rocks, 8 December 2020, J. Villablanca Rivera & V. Villablanca Miranda leg. (MNHCL 8374). III Región de Atacama, Copiapó, 26°58'59.36"S 70°0'25.07"W, 1,743 m a.s.l, 3 females, collected in rodent burrow, 16 December 2019, J. Villablanca Rivera & V. Villablanca Miranda (LEULS 005).

Description. Male holotype: Measurements: Total length (without chelicerae) 7.5. Carapace 3.4 long, 3.0 wide. Clypeus length 0.21. Carapace light brown, longer than wide, narrowed anteriorly, dorsally without the typical 'violin' pattern and the cephalic zone reddish-brown. Carapace with 3 small lateral brown spots in each side, 1 central dark-brown spot on thoracic furrow and 2 brown spots near to cephalic zone (Fig. 1B). Sternum 1.9 long, 1.5 wide. Chelicerae red brown. Eye diameters: ALE = 0.18, PME = 0.19, PLE = 0.18. Opisthosoma uniformly grey, longer than wide. Legs yellowish. Leg I: 6.9, 1.5, 7.5, 7.5, 1.8, total (25.2). II: 7.5, 1.5, 8.1, 8.2, 1.8, (27.1). III: 6.2, 1.1, 7.1, 7.4, 1.9, (23.7). IV: 8.3, 1.9, 7.7, 8.2, 1.5, (27.6). Leg formula 4213. Palp: femur 3.5 long, 0.4 wide, patella 0.64 long, 0.58 wide, tibia 1.5 long, 0.6 wide. Cymbium (0.58 long), rounded apically, shorter than the tibia. Palp with bulb globular and a straight and long embolus with a truncated tip (Figs. 2 A-C).

Female: Measurements: Total length (without chelicerae) 8.3. Carapace long 3.9, 3.1 wide. Clypeus length 0.25. Carapace yellowish with brown spots strongest marked and without reddish-brown color in the cephalic zone (Fig. 1A). Eye diameters: ALE = 0.18, PME = 0.22, PLE = 0.19. Leg I: femur 6.6, patella 1.1, tibia 7.5, metatarsus 7.5, tarsus 1.6, total (23.1). II: 7.5, 1.2, 8.6, 9.1, 1.8, (25.2). III: 6.2, 1.1, 6.1, 7.2, 1.3, (21.9). IV: 6.9, 1.6, 7.0, 8.2, 2.0, (25.7). Leg formula 4213. Palp yellow, except for orange tibia and tarsus. Opisthosoma uniformly grey, longer than wide. Legs yellowish. Palp: femur 1.22, patella 0.39, tibia 1.3, tarsus 1.4. Spermatheca with broad base and narrow-elongated receptacles, with longer internals (Fig. 2D).

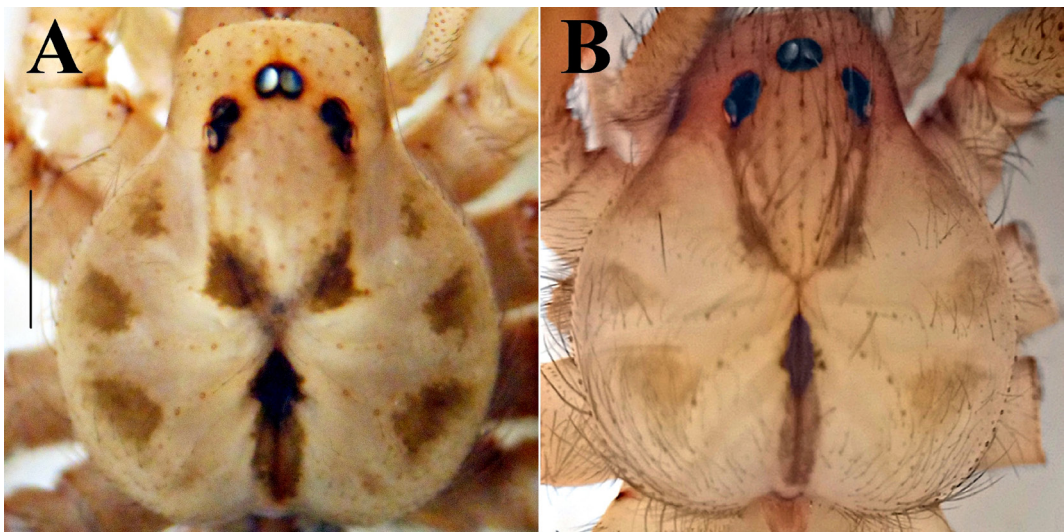
Natural history. This species lives in semi-arid environments in rocky areas, associated with grass and low vegetation (Fig. 3). The vegetation is frequently of the hawthorn type, such as cacti, with stunted shrubs, deciduous trees and semi-desert grasslands (Luebert & Plissock 2006). This species is absent in urbanized environments and is endemic to the semi-arid region of Chile. Individuals of *Loxosceles vicentei* sp. nov. were collected only under rocks in mountain natural environments. Specimens of both sexes were often observed together in the same microhabitats (Figs. 4 A-B). Despite the presence of so many rocks in the area, a low population density was found. Remains of beetles consumed in the nests were observed.

Distribution. Chile, Atacama and Coquimbo regions (Fig. 5).

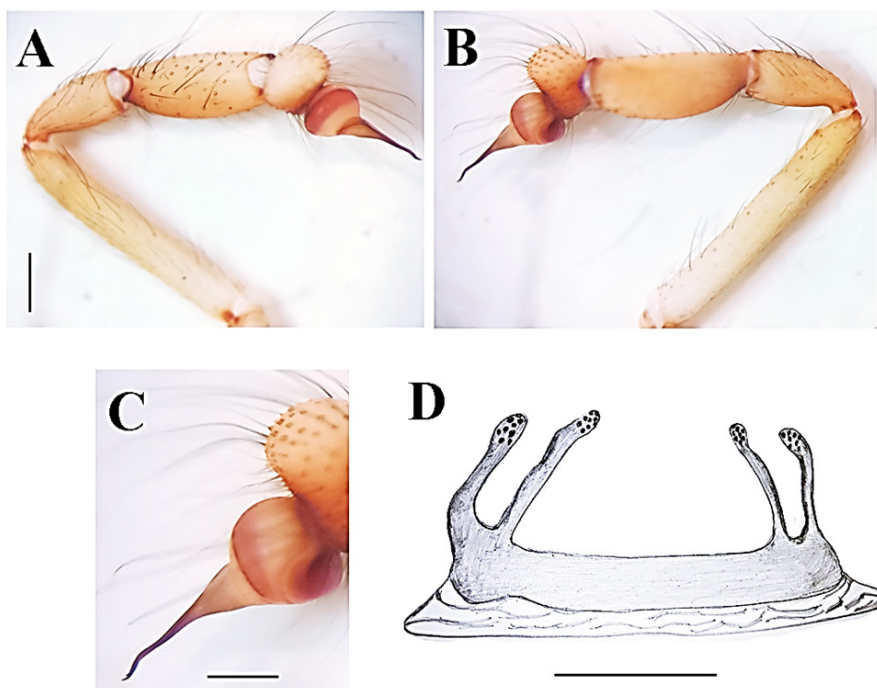
Discussion

The new species can be included in the *laeta* species-group *sensu* Gertsch (1967) based on details of copulatory organs as well as on the leg formula (4213). In Chile is currently represented by *L. laeta*, *L. surca* and *L. coquimbo*. It is important to mention that the genitalia of the females of the *laeta* species-group usually are more variable than those of the males (Gertsch 1967). Therefore, the inclusion of *Loxosceles vicentei* sp. nov. in this group seems reasonable since the male having a long palpal tibia. The male palp usually has low intraspecific variation in the genus *Loxosceles* (Gertsch 1967; Brescovit *et al.* 2017), which allows us to point out that *L. vicentei* sp. nov. is clearly a new species and not a variation of other species from Chile previously described. On the other hand, the climatic and geographic conditions of the habitat where *L. vicentei* sp. nov. is found are totally different from those of *L. coquimbo* and *L. laeta*, which lives mainly in low altitude coastal environments and urban areas. No specimen of this species was found in a synanthropic situation.

The *laeta* species-group seems to be especially diverse in the deserts of South America, and clearly, their specific richness has been underestimated (Brescovit *et al.* 2017). Finally, we can say that the number of species of the genus *Loxosceles* in Chile has been increased and we suggest the possibility of other species that are still to be discovered in these interesting ecosystems. A relevant aspect to study in the future is the morphological and genetic variability of the genus in Chile, incorporating both ecological and molecular data.



Figures 1A-B. *Loxosceles vicentei* sp. nov. Carapace of female and male. A. Female paratype. B. Male holotype. Scale bar: 1 mm. / *Loxosceles vicentei* sp. nov. Cefalotórax de hembra y macho. A. Hembra paratipo. B. Macho holotipo. Barra de escala: 1 mm.



Figures 2A-D. *Loxosceles vicentei* sp. nov. Fundo el Calvario, Juntas del Toro, Vicuña, Coquimbo. A. Holotype male's palp, prolateral view. B. Retrolateral view. C. Detail of the bulb and embolus, retrolateral view. D. Paratype female, seminal receptacles, dorsal view. Scale bars: 0.5 mm for A and B, 0.2 mm for C and 0.5 mm for D. / *Loxosceles vicentei* sp. nov. Fundo el Calvario, Juntas del Toro, Vicuña, Coquimbo. A. Palpo del macho holotipo, vista prolateral. B. Vista retrolateral. C. Detalle del bulbo y émbolo, vista retrolateral. D. Hembra paratipo, receptáculos seminales, vista dorsal. Barra de escala: 0,5 mm para A y B, 0,2 mm para C y 0,5 mm para D.



Figure 3. Habitat of *Loxosceles vicentei* sp. nov. in the type locality. / Hábitat de *Loxosceles vicentei* sp. nov. en la localidad tipo.



Figures 4A-B. Live specimens of *Loxosceles vicentei* **sp. nov.** found under rocks in type locality (photography: Vicente Villablanca). A. Female paratype, dorsal view. B. Male holotype, dorsal view. / Especímenes vivos de *Loxosceles vicentei* **sp. nov.**, hallados bajo rocas en la localidad tipo (fotografía de Vicente Villablanca). A. Hembra paratipo, vista dorsal. B. Macho holotipo, vista dorsal.

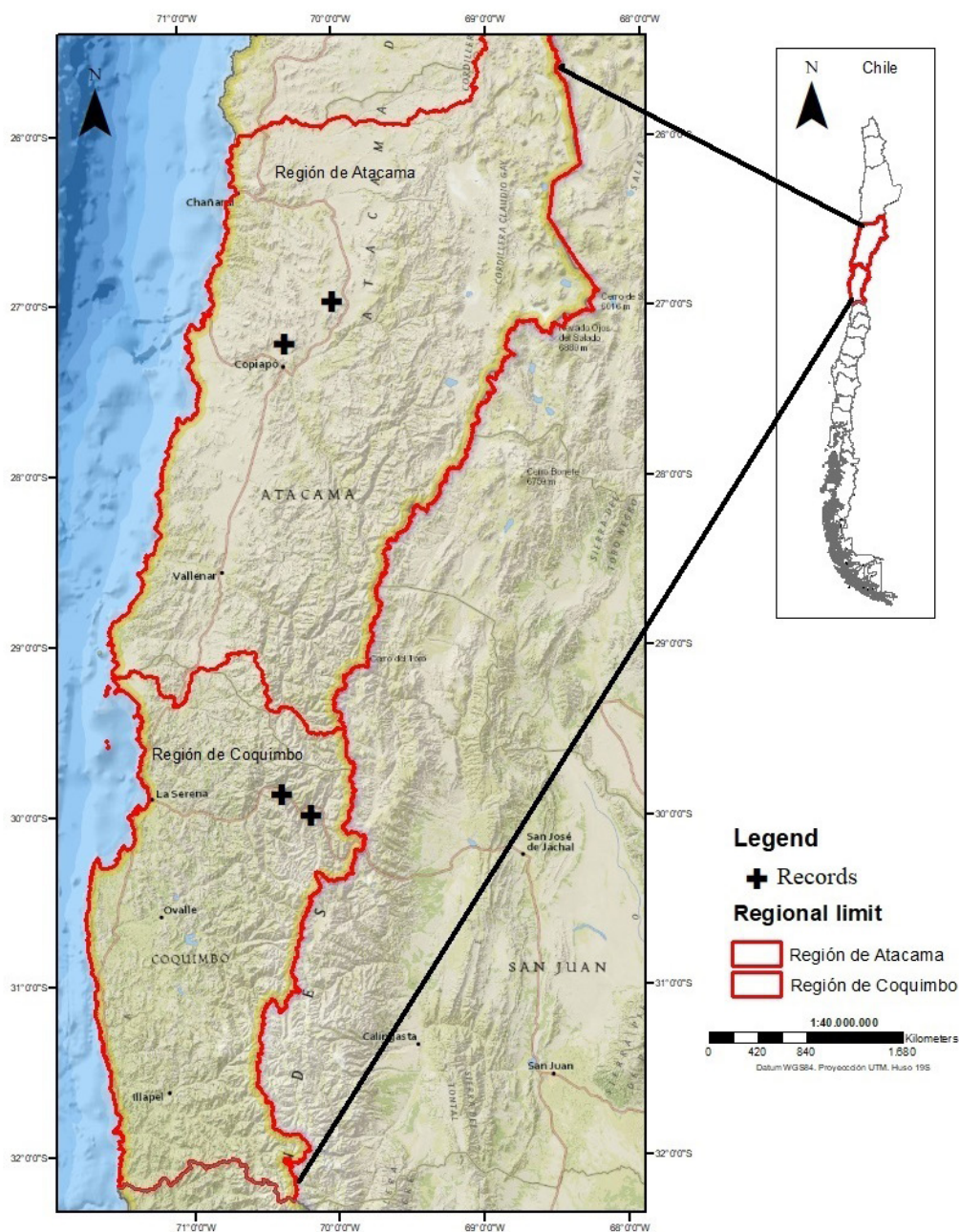


Figure 5. Geographic distribution records of *Loxosceles vicentei* sp. nov. in Chile. / Registros de distribución geográfica de *Loxosceles vicentei* sp. nov. en Chile.

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