

First record of *Latrodectus mirabilis* (Araneae: Theridiidae) from southern Brazil and data on natural history of the species

Primer registro de *Latrodectus mirabilis* (Araneae: Theridiidae) en el sur de Brasil e información sobre la historia natural de la especie

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Abstract: The spider *Latrodectus mirabilis* is recorded for Brazil, based on specimens collected in outcrops areas at Área de Proteção Ambiental do Rio Ibirapuitã, Sant'Ana do Livramento, in the state of Rio Grande do Sul. The only species of the genus known from Brazil were *L. curacaviensis*, *L. geometricus* and *L. mactans*.

Key words: New records. Latrodectinae. Neotropical. Pampa Biome.

Resumen: La araña *Latrodectus mirabilis* se registró a partir de Brasil, a partir de muestras recogidas en las zonas de afloramientos rocosos en el Área de Protección Ambiental do Río Ibirapuitã, Sant'Ana do Livramento, Rio Grande do Sul, Brasil. Las únicas especies conocidas para el Brasil eran *L. curacaviensis*, *L. geometricus* and *L. mactans*.

Palabras clave: Nuevos registros. Latrodectinae. Neotropical. Bioma Pampa.

Introduction

Latrodectus Walckenaer, 1805 include spiders of relevant medical interest (Aguilera *et al.* 2009). The genus comprises 31 species (Platnick 2013). Some species show worldwide distribution as the brown widow *Latrodectus geometricus* C. L. Koch, 1841 and the popularly known and highly venomous black widow *L. mactans* (Fabricius, 1775). Garb *et al.* (2004) indicated that the very broad diet of this spiders includes a large range of invertebrates and also some warm and vertebrates, might explain the highly potent latrotoxin- α , a vertebrates-specific neurotoxin, in the venom of these spiders. These characteristics combined with the synanthropic habits of some species make these spiders species of public health interest.

According to Levi (1959) there are at last three species of the genus *Latrodectus* recorded from Brazil: *L. curacaviensis* (Müller, 1776), *L. geometricus* and *L. mactans*. Of these, *L. geometricus* is a cosmopolitan species with possible African origin, while *L. mactans* and *L. curacaviensis* are much likely New World natives (Garb *et al.* 2004). Records of *L. geometricus* and *L. curacaviensis* from Brazil are well known and confirmed, however most records of *L. mactans* are dubious and are usually referred to as "Latrodectus group *mactans*" (Lira-da-Silva *et al.* 1995; Rocha Dias and Brazil 1999).

The introduced and synanthropic species *L. geometricus* is commonly found in southern Brazil with several records

from different localities of Rio Grande do Sul registered in the arachnological collection of the Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul. On the other hand *L. curacaviensis* is commonly found further north along the Atlantic Forest area from southeast to northeast of Brazil, with no confirmed records in Rio Grande do Sul (Fundação Nacional de Saúde 1998). *Latrodectus mirabilis* (Holmberg, 1876) was originally described from Argentina (see distribution at Abalos 1980: 35) and is also known from Uruguay (Capocasale and Pereira 2003), Peru and "Patagônia" (Chile and Argentina), in the last case by a not clear taxonomic data register (Canals *et al.* 2004). As noted above *L. mactans* registers in Brazil are not entirely trustable; however the species was recorded to northeast of the country by Levi (1959).

According to Garb *et al.* (2004), based on molecular data, explained that the taxonomic status of *L. mirabilis*, *L. variegatus* Nicolet, 1849, *L. corallinus* Abalos, 1980 and *L. diaguaita* Carcavallo, 1960 seems to be unclear because they "share nearly identical sequences" suggesting that the recognition of multiple species within groups could be nothing else as a "taxonomic artifact". However, the herein presented identification of *L. mirabilis* was made based on the taxonomic characters proposed by Abalos (1980).

In this study, we present the records of *Latrodectus mirabilis* in Brazil in the state of Rio Grande do Sul, expanding its known geographic distribution in South America and also presenting data on natural history of species.

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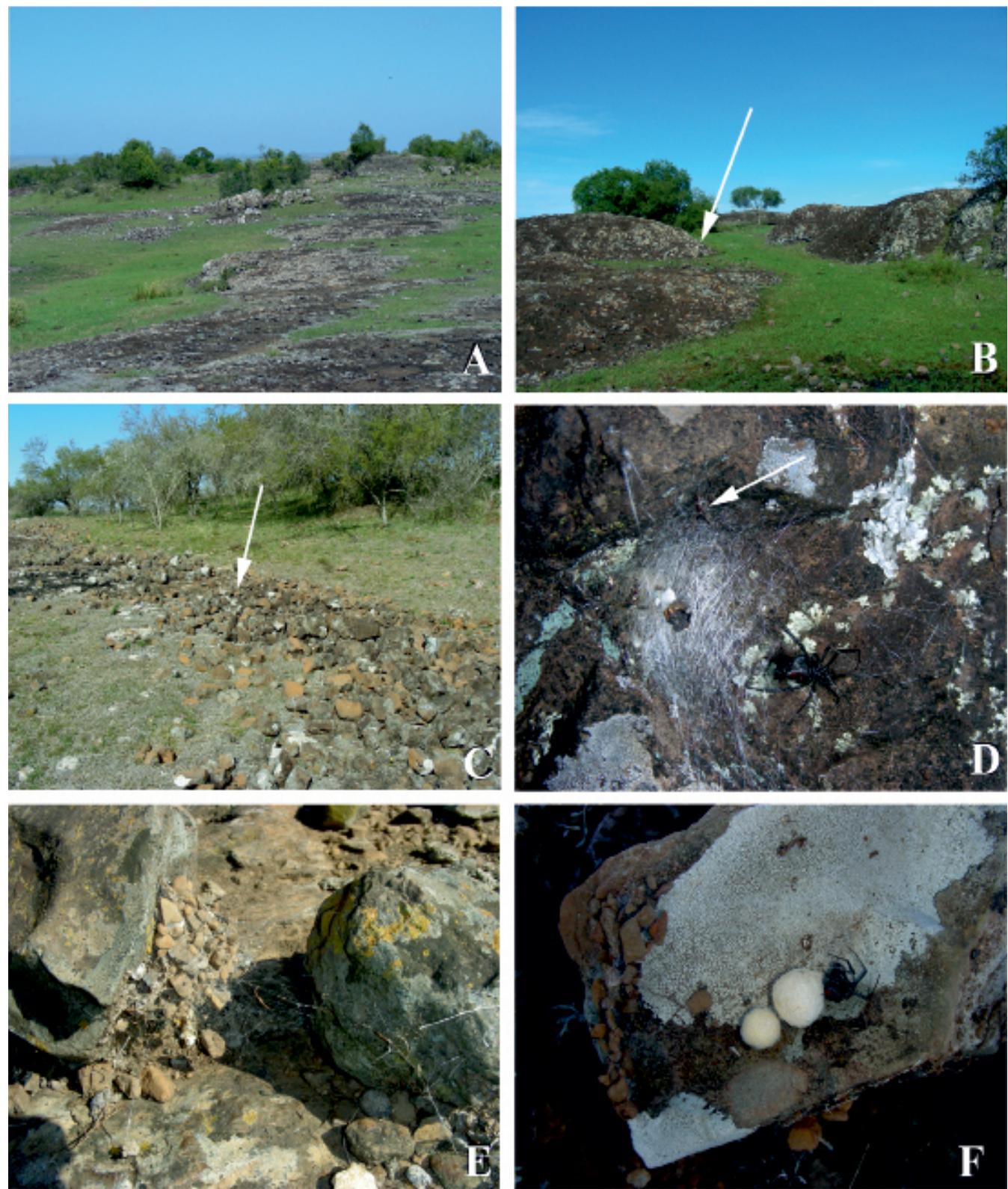


Figure 1. A. Habitat of *Latrodectus mirabilis* in Pampa Biome, Sant'Ana do Livramento, RS, Brazil, details of basalt outcrops at the APA do Rio Ibirapuitã. B. y C. *Latrodectus mirabilis* webs construction sites (arrows). D. Male (arrow) and female at retreat entrance. E. female retreat covered with small stones. F. Female and cocoons.

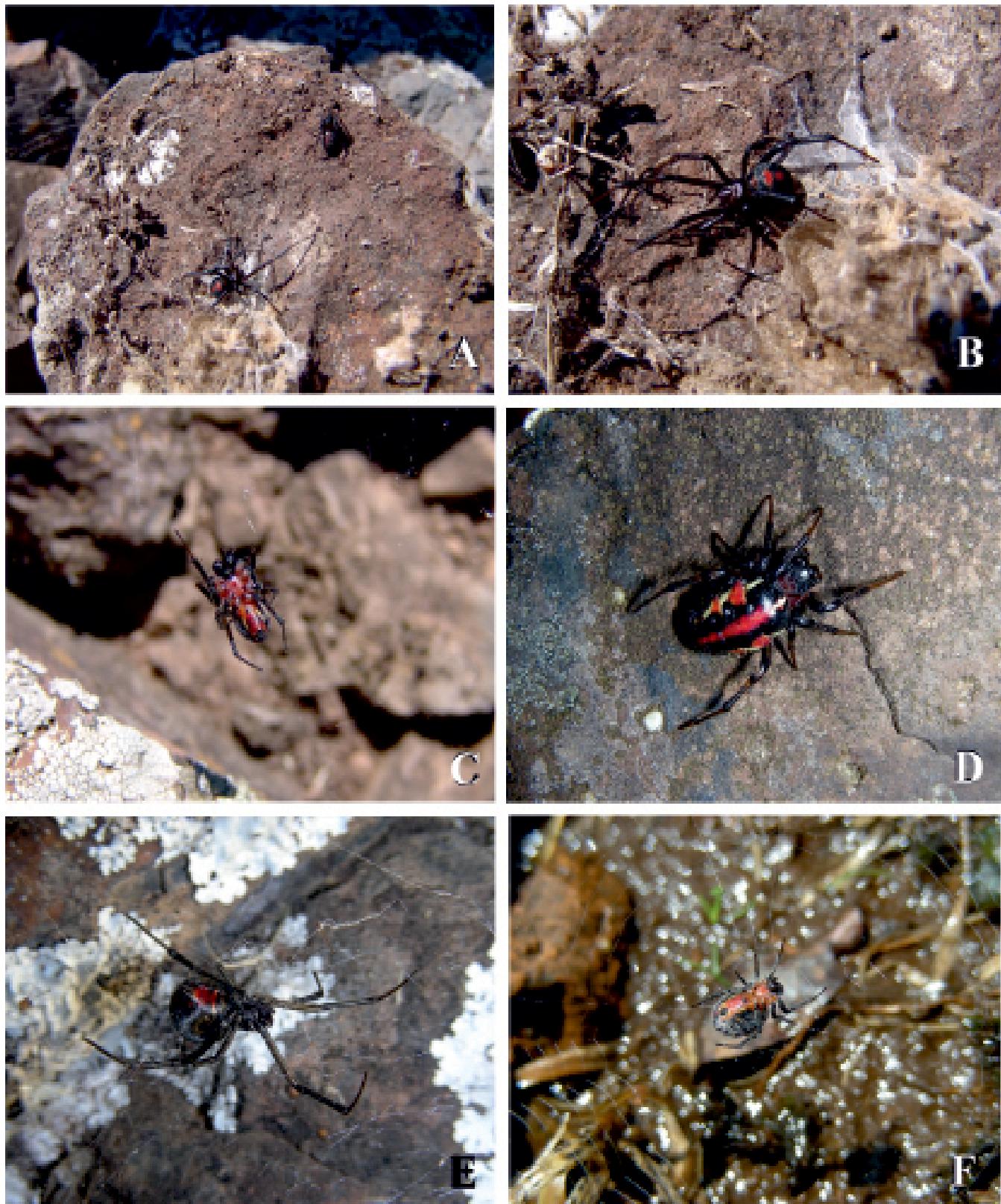


Figure 2. **A.** *Latrodectus mirabilis* (lower spider at image) and *Alpaida versicolor* (upper spider at image). **B.** Female of *L. mirabilis*, dorsal view of abdomen. **C.** Male of *A. versicolor*, ventral at web. **D.** Female of *A. versicolor*, dorsal. **E.** Female of *Latrodectus mirabilis* ventral at web. **F.** Female of *A. versicolor* ventral at web.

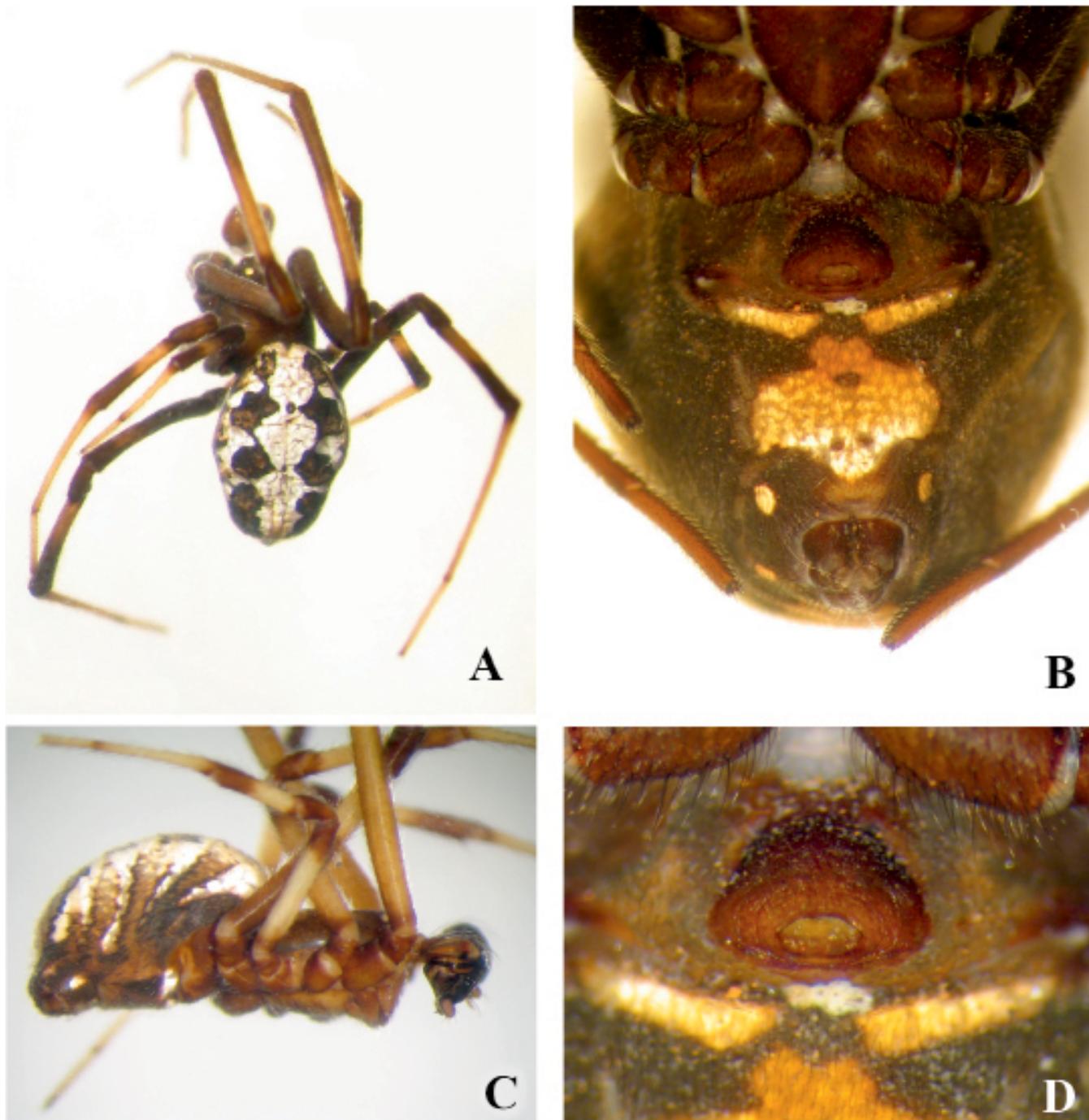


Figure 3. *Latrodectus mirabilis*. **A.** Male, dorsal view. **B.** Female abdomen, ventral view. **C.** Male, lateral view. **D.** Female, detail of epigyne.

Material and methods

The material examined was deposited in the arachnological collection of Museu de Ciências Naturais da Fundação Zoológica do Rio Grande do Sul (MCN, curator: R. Ott). Images were obtained at stereomicroscope with a digital camera attached. Multi-focus stack images were made using Helicon Focus multi-range program. Records were obtained in two main locations Passo do Ferrão ($30^{\circ}27'15.97''S$ $55^{\circ}43'25.71''W$) and Passo do Cerrito ($30^{\circ}36'33.87''S$ $55^{\circ}38'30.18''W$) inside the Área de Proteção Ambiental do

Rio Ibirapuitã (APA do Ibirapuitã), municipality of Sant'Ana do Livramento, Rio Grande do Sul, Brazil.

Results and discussion

Latrodectus mirabilis (Holmberg, 1876)

Figs. 1D, 2A-2B, 2E, 3A-3D

Theridium mirabile Holmberg, 1876: 11; *L. curacaviensis*, Levi, 1959: 39, fig. 69. *L. mirabilis*, Abalos, 1980: 31, figs. 1-13, 21.

Diagnosis. *Latrodectus mirabilis* is included in the *L. mactans* group by the shape of the male embolus, presenting three coils (Levi 1959; Bücherl 1965; Abalos 1980). The species can be distinguished from *L. mactans* by the smaller size of males (Abalos 1980: 33-34, figs. 11-14). The species is close *L. quartus* Abalos, 1980 and *L. thoracicus* Nicolet, 1849 by the shape of the female epigyne opening with usually straight rather than indented or irregular anterior border (Fig. 16; see also Abalos 1980: 33, 42, figs. 13, 38 and Aguilera 2009: 166, fig. 3a), by the smaller male size and by the paler male abdomen (Abalos 1980: 33, 42, figs. 11, 43; Aguilera *et al.* 2009: fig. 4f). Males of *L. mirabilis* can be distinguished from those of *L. corallinus* and *L. diaguita* by the shape of the dorsal markings on the abdomen (Fig. 13; see also Abalos 1980: 33, fig. 11). Females of *L. mirabilis* can be distinguished from those of *L. quartus* and *L. thoracicus* by the more rounded ectal borders of the female epigyne opening (Fig. 16; see also Abalos 1980: 33, 42, figs. 13, 38 and Aguilera 2009: 166, fig. 3a) and also from *L. quartus* by the shape of the ventral markings on the abdomen and *L. corallinus* by dorsal and ventral markings on the abdomen (Fig. 14; see also Abalos 1980: 33, 42, figs. 7-8, 41). Females of *L. mirabilis* can be distinguished from those of *L. diaguita* by the shape of the female epigyne opening (Fig. 16; see also Abalos 1980: 33, fig. 13).

Description: see Abalos (1980: 31-36; figs. 1-13).

Examined material. BRAZIL. Rio Grande do Sul. Sant'Ana do Livramento: 3♂, 10♀, Passo do Ferrão ($30^{\circ}27'15.97''S$ $55^{\circ}43'25.71''W$), R. Ott leg. (MCN49306); 1♀, 10.II.2012 (MCN49307); 1♀, 15.V.2012 (MCN49308); 1♀, 15.V.2012 (MCN49309), all Passo do Cerrito (APPC, $30^{\circ}36'33.87''S$ $55^{\circ}38'30.18''W$), Equipe PELD leg.

Natural history. *Latrodectus mirabilis* (Figs. 1D, 2A-2B, 2E, 3A-3D) can be easily found at basalt outcrops or under stones in outcrops areas (Figs. 1A, AB) at the APA do Rio Ibirapuitã, located at the Pampa biome, similar to the environments reported for the species by Barrantes and Eberhardt (2010) and also reported for an undetermined species of *Latrodectus* by González (1977). No additional specimens were found elsewhere in the areas and so far none was registered in any anthropic areas in this region.

The web of this species is basically a plan sheet build with irregularly displaced treads; the bidimensional horizontal shape is also of irregular borders and can reach almost 60 cm in maximum diameter and is located 5-10 cm above ground in habitats such as nearly oblique outcrops sides (Fig. 1B) to horizontal outcrops areas with or without loose stones (Fig. 1C). Spiders were never recorded at adjacent grasslands or shrub vegetation in this area. Grisolía *et al.* (1992) reported that the species could be frequently found in anthropic environments with many bite accident reports but no human death cases registered. At APA do Ibirapuitã, females were usually found inside a silk retreat (Fig. 1D) which can be structurally assembled with remains of prey (see also Abalos 1980), vegetation debris and more rarely with small stones (Fig. 1E). Adult males (Figs. 3A, 3C) were all collected in May (autumn at Southern Hemisphere), close to the female retreat (Fig. 1D).

It was observed the presence of webs of araneid *Alpaida versicolor* (Keyserling, 1877) very close to the webs of *L.*

mirabilis, with spiders sharing even the same stone as retreat place (Fig. 2A). Interestingly in this case, the webs of *A. versicolor* were horizontally placed, in quite similar orientation positions as the nets of *L. mirabilis* (Figs. 2C, 2E, 2F). Some *A. versicolor* specimens are very similar as the coloration found at *L. mirabilis* of the same area (Figs. 2A-2F). It is questionable if *A. versicolor* specimens could take some advantage from the possible aposematic coloration of *L. mirabilis*; however similar observations were accomplished by Levi (1965) regarding *L. mactans tredecimguttatus* (Rossi, 1790) and two european arthropods species, the millipede *Glomeris pulchra* Koch, 1847 and the isopod *Armadillidium klugii* Brandt, 1833.

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