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Jollas oklanderae n. sp., a new beetle-like spider from Northeast Argentina (Araneae: Salticidae: Sitticini)

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Abstract. Within the diverse South American fauna of jumping spiders, the genus *Jollas* comprises small spiders, generally associated with grasslands or flooded areas and rocky areas with bare soil. In Argentina, six species are known for this genus. In the present work, we describe a new species of *Jollas* for the north of the country, with unique beetle mimicry features.

Keywords. description, jumping spider, new species, taxonomy

Introduction

The genus *Jollas* Simon 1901 is a group of small Neotropical jumping spiders with variable morphological characteristics. According to the available information, they seem to inhabit areas with marsh or even aquatic vegetation, such as swamps or flooded grasslands, but also rocky areas with bare soil.

Maddison et al. (2020) describe two groups within this genus, clearly distinguishable by their external appearance. The first group includes spiders with a glabrous and shiny appearance, stylized and with a more "fragile" look (designated as the "*geniculatus* group" by Galiano, 1991). On the other hand, it groups together the Neotropical species that were previously placed within the genus *Sitticus* Simon, 1901, with more robust bodies and covered with opaque scales (designated as the "*leucoproctus* group" by Galiano, 1989), such as *Jollas cellulanus* (Galiano, 1989), *J. flabellatus* (Galiano, 1989), and *J. leucoproctus* (Mello-Leitão, 1944).

We analyse several individuals collected by the Argentine Salticids Research Group (GISA) belonging to four of the six known species of *Jollas* inhabiting the country (CAA 2024), and one new undescribed species, comparing both their reproductive structures and their external morphological characters, and reviewing possible concordances or inconsistencies with the published bibliography on this genus, particularly the works of Galiano (1989, 1991) and Maddison et al. (2020). In this work, we describe a new species of the *leucoproctus* group.

Material & methods

The material examined was collected by the authors and some of these represent type specimens. The description format and measurements follow those of Galiano (1963), with morphological terms and the interpretation of structures as in Edwards (2015). Female genitalia were dissected as described by Levi (1965), internal structures were examined after digestion in a hot ~15% NaOH solution and cleared in clove oil solution. The pieces were placed in a double boiler and heated in a Fuyí © heater for anti-mosquito tablets (Ramírez 2014). Temporary slide preparations were observed and photographed using a Leica DM500 compound microscope and a Leica M60 stereomicroscope. Structures were sketched from direct observation and digital image models on the microscope/stereomicroscope using a computer system for drawing and image processing (Wacom digitizer tablet with Corel Draw software). Measurements were taken directly from a micrometre ocular lens and are given in millimetres. Live photographs were taken using a Nikon D3400 digital camera with a Raynox 250 or a Micro-Nikkor 85 mm lenses. Plates were edited and composed in Corel Draw. Specimens were examined from the spiders' collection of the Instituto de Biología Subtropical (IBSI-Ar) under the curatorial care of the Argentine Salticids Research Group (GISA), Misiones.

Morphology acronyms. ALE = anterior lateral eye; AME = anterior median eye; CD = copulatory duct; CO = copulatory opening; CP = coupling pocket; PLE = posterior lateral eye; PME = posterior median eye; RTA = retrolateral tibial apophysis.

Tribe Sitticini Simon, 1901

Jollas Simon, 1901

Composition. Sixteen species, with *Jollas geniculatus* Simon, 1901 being the type species of the genus (WSC 2024, Metzner 2024), and *J. oklanderae* n. sp. the new species described here.

Jollas oklanderae n. sp. (Figures 1–28)

Type material. Holotype 1♂ (IBSI-Ar 01232), ARGENTINA, Misiones, Candelaria, Santa Cecilia, -27.4504° -55.7163°, 13 January 2019, beating, JE Baigorria leg. Allotype 1♀ (IBSI-Ar 01843), same locality and collector, 15 December 2022. Paratype 1♂, 1♀ (IBSI-Ar 01814), same locality and collector, 7 October 2022, beating. Types are in the collection of the Instituto de Biología Subtropical (IBS), Misiones.

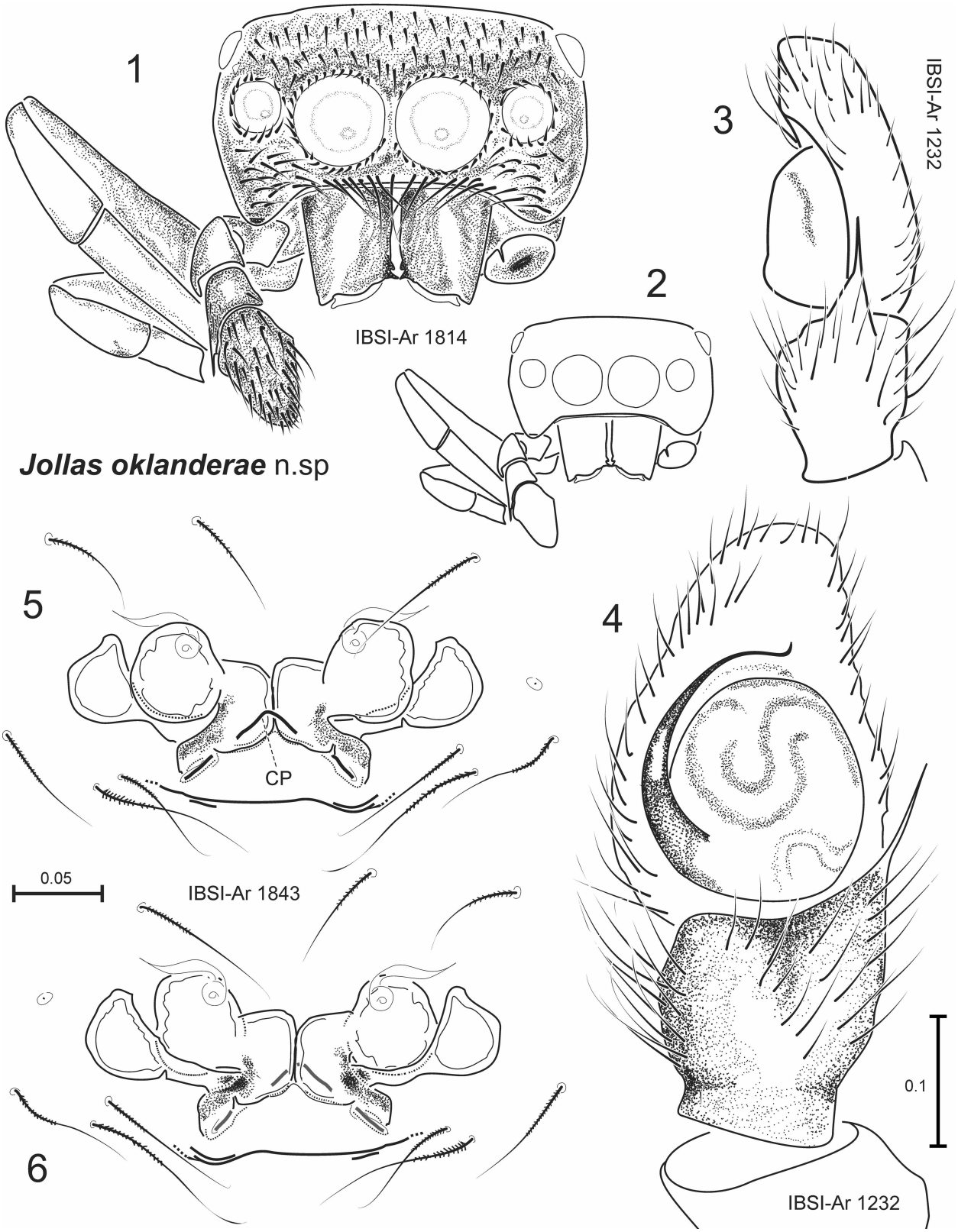
Diagnosis. *Jollas oklanderae* n. sp. resembles some *Jollas* of the *leucoproctus* group such as *J. cellulanus*, *J. flabellatus* and *J. leucoproctus* in having the mottled habitus, covered with dark greyish hair, the carapace with granulated cuticle, and the slightly more robust body than those of the *geniculatus* group. The male palp is discoid and has a thick-based RTA and long, acute apex as in these three aforementioned species, but can be easily distinguished by the lack of a *pars pendula* on embolus, generally ribbon-tipped, as can be seen in those species (Figures 3-4). The female has the characteristic habitus of the *leucoproctus* group; the epigyne externally resembles that of *J. manantiales* Galiano, 1991 by the COs barely marked and by having a transverse groove with an angular or curved shape (coupling pocket in *J. oklanderae* n. sp., and part of the COs in *J. manantiales*), and internally it resembles that of *J. paranacito* Galiano, 1991 by the position of the spermathecae and the sack-ducts; but it is distinguished from all *Jollas* species by its inverted V-shaped coupling pocket (Figure 5). Furthermore, the internal epigyne of *J. oklanderae* n. sp. is very different from the rest of the *leucoproctus* group, having more spherical and robust spermathecae (Figures 5-6); both sexes of *J. oklanderae* n. sp. have squat bodies, shaped like small beetles (Figures 7-28).

Etymology. The species is named in honour of Dr. Luciana I. Oklander, JEMB's beloved wife and mother of his two daughters, Ivy and Atenea, in gratitude for sharing her life and her love for nature conservation.

Description of male (holotype) (Figures 3-4, 7-13). Total length 2.30. Carapace length 1.20, width 1.00, height 0.60; abdomen length 1.20, width 1.05. Clypeus 0.04. Anterior eyes row slightly recurved. Upper edge of the AME in line with that of ALE (in frontal view). Carapace granulated, covered with small translucent hairs (Figure 7); eye quadrangle length 0.60, width 0.97 (at PLE). Ocular diameters: AME 0.25, ALE 0.12, PME 0.04, PLE 0.12. Fovea absent. Two thoracic stretch marks forming something like a triangle, on the thoracic slope. Chelicerae vertical, almost parallel, paturon without mastidion; paturon length 0.42, five promarginal teeth (the distal smaller) and no retromarginal teeth. Labium length 0.17, width 0.25. External angle of the endites rounded. Sternum length 0.45, width 0.40. Abdomen integument smoother than the carapace, covered with small translucent hairs. Abdomen covered with a scutum (Figures 7-8). First pair of legs longer than the rest, with three pairs of ventral spines on tibia, and two ventral pairs on metatarsus. Palp as in figures 3-4. Palpal femur length 0.35; tibia length 0.20, width 0.17; cymbium length 0.32, hirsute. Bulb discoid, length 0.19, width 0.16. RTA conspicuous, with wide base and very long and thin tip. Embolus sclerotized, arising from the prolateral base of the bulb and accompanying it half a turn prolaterally, tip of the embolus at the distal part of the bulb; not associated with projections. Colouration (Figures 7-13): Carapace dark brown to mahogany, darker on ocular quadrangle, covered with small translucent hairs. Abdomen dark brown, with a reflective shine from the dorsal scutum; anterior edge of abdomen with tufts of thick brown, black and white hairs. All ventral side brown. Legs dark brown from coxae to basal half of tibia, lighter brown thereafter. Palps and chelicerae brown; labium and endites brown with the anterior edges paler; sternum brown, slightly lighter. In natural life, the specimen looks black, with scattered golden yellow hairs on the carapace and anterior edge of the abdomen. The legs look ringed distally, with light brown. See also non-holotype specimen (Figures 14-17).

Description of female (allotype) (Figures 5-6, 18-28). Female and male are similar in habitus and proportions, although the female does not have the dorsal abdominal scutum; chelicerae and endites are also similar. Measurements: total length 2.39. Carapace length 1.10, width 0.92, height 0.56; abdomen length 1.50, width 1.10. Clypeus 0.04. Arrangement of the eyes as in the male. Carapace granulated and covered with fine hairs as in male (Figure 18); eye quadrangle length 0.58, width 0.90 (at PLE). Ocular diameters: AME 0.25, ALE 0.15, PME 0.05, PLE 0.12. Fovea absent. Chelicerae as in male; paturon length 0.30. Labium and endites as in the male. Sternum length 0.40, width 0.32. Abdomen integument smoother than the carapace, covered with small translucent hairs. Abdomen with a pair of punctate marks over the cardiac area (Figures 18, 21, 24). Legs as in male, a little less strong. Epigyne (Figures 5-6): weakly sclerotized plate; small, hard-to-see COs that open in a small slit-like shape and enter towards the lateral sides and then anteriorly. The spermathecae located anteriorly, slightly ventral. CDs with a sack-shaped stretch, directed anteriorly and laterally (glandular according to Galiano 1991). Fertilization ducts visible on the spermathecae, located anteriorly and dorsally. Colouration (Figures 18-28): Carapace as in male. Abdomen dark brown to black, without dorsal scutum, some scattered small iridescent hairs; anterior edge of abdomen with tufts of thick brown, black and white hairs (as in male). Ventral side as in male. Legs as in male, slightly lighter. Palps, chelicerae, labium, endites, and sternum as in male. In natural life, the female looks as the male.

Distribution. Only known from Candelaria, south of Misiones, Argentina.

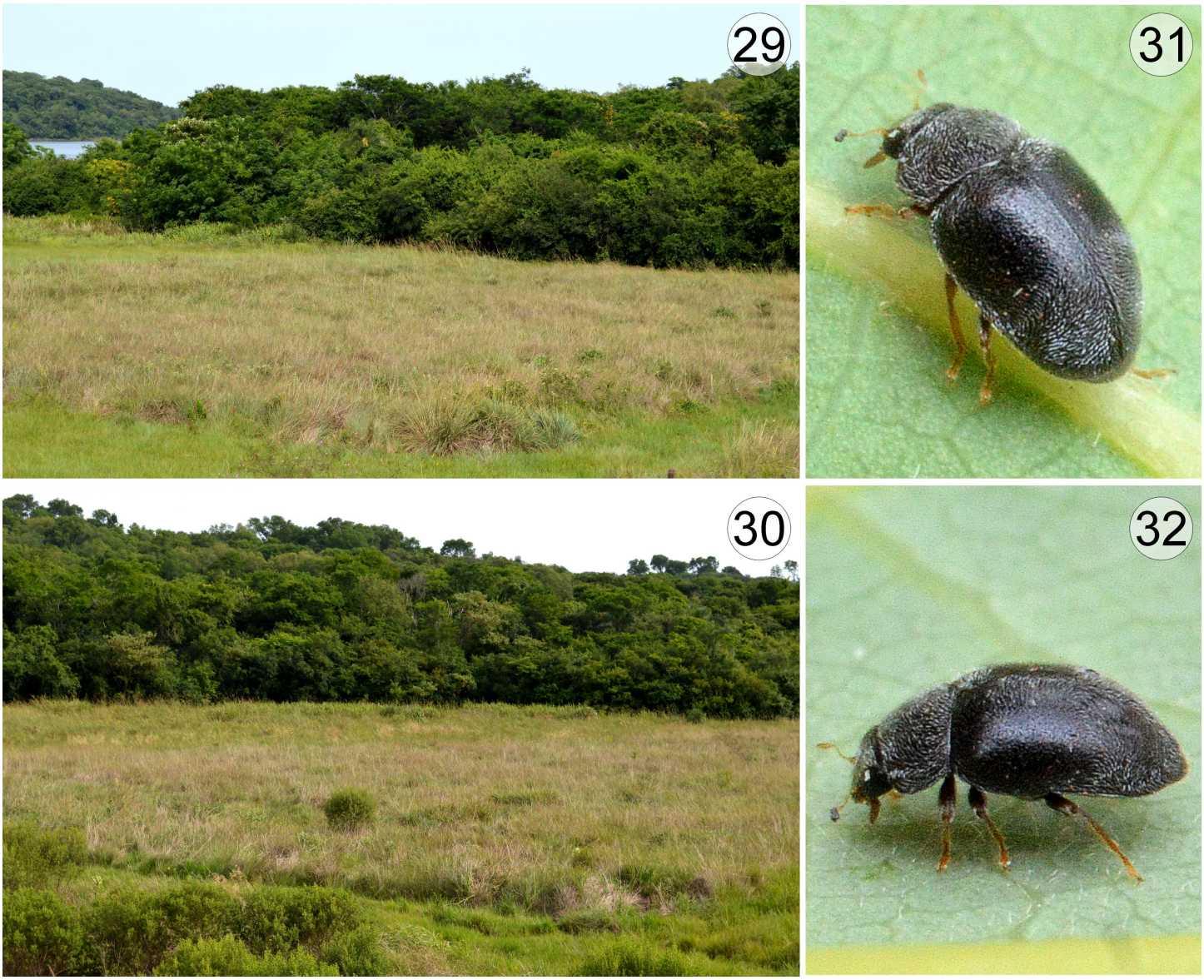


Figures 1-6. *Jollas oklanderae* n. sp. **1-2,** ♂ (IBSI-Ar 1814) in frontal view. **3,** Left ♂ palp of holotype in retrolateral view. **4,** Same, ventral view. **5,** Cleared ♀ epigyne of allotype in ventral view. **6,** Same, dorsal view. CP = coupling pocket.

Figures 7-17. Habitus in nature of *Jollas oklanderae* n. sp. **7-13,** Holotype ♂ specimen in different views. **14-17,** ♂ specimen (IBSI-Ar 1594), different views.

Figures 18-28. Habitus in nature of *Jollas oklanderae* n. sp., allotype ♀ specimen in different views.

Natural History. *Jollas oklanderae* n. sp. was only collected in the southern cone mesopotamian savanna ecoregion, in the municipality of Candelaria, Misiones, in areas with tall grasses, in areas where low-density livestock farming is carried out with native pastures, and in areas where the grasslands have not been disturbed in the last 5 years (Figures 29-30). It seems to prefer large, leafy clumps of grass, and is often found in the company of other salticids such as *Pachomius areteguazu* Rubio, Stolar & Baigorria, 2021 and *Maeota dorsalis* Zhang & Maddison, 2012. Its dark, slightly shiny, rounded body gives it a very similar appearance to that of the numerous beetles of the family Coccinellidae that inhabit these grasslands, which it seems to imitate (Figures 31-32).



Figures 29-32. Habitat where type specimens of *Jollas oklanderae* n. sp. were found, and its potential model of beetle mimicry obtained in the same samples.

Unlike other species such as *Ahijuna patoruzito* Rubio, Baigorria & Stolar, 2022 or *Lumptibiella camporum* Rubio, Baigorria & Stolar, 2022, which were collected in the same area but are very rare and do not usually appear in the samples, *Jollas oklanderae* n. sp. seems to be relatively abundant, at least in the collection sectors.

Other material examined. 1♂ (IBSI-Ar 01517), ARGENTINA, Misiones, Candelaria, Santa Cecilia, -27.4504° -55.7163°, September 2020, beating, JE Baigorria leg.; 1♂ (IBSI-Ar 01594), Candelaria, Urutaú Nature Reserve, -27.4802° -55.7925°, 5 February 2021, GD Rubio, JE Baigorria & CE Stolar leg.

Concluding remarks

Analysing what was proposed by Maddison et al. (2020), *J. oklanderae* n. sp. could be placed within the "*leucoproctus* group" proposed by these authors, although the species shares some characteristics with both groups. The species has a dark integument, and its body is covered with scattered dull scaly hairs. Although its beetle-like appearance is unique within the genus, in general it is much more similar to the species of the *leucoproctus* group, since they are relatively robust spiders, with strong limbs compared to their size. The RTA of the male has a wide base that then narrows considerably, which also corresponds to what has been observed in other males within this subgroup. Nevertheless, the female genitalia resemble more those of the *geniculatus* group and the male embolus does not have a *pars pendula*. *Jollas oklanderae* n. sp. seems to be "half way" between these two groups, but until further genetic data is available for these species, and based on the number of shared characteristics, we propose that this species should be placed in the *leucoproctus* group.

The new species described here is relatively abundant in the grasslands of southern Misiones, but it was still unknown until now. In the last 4 years, the Argentine Salticids Research Group (GISA) has described more than 10 new species inhabiting the remaining natural grasslands that are found within this highly populated area, and it is working on the description of several more. Most of these species have not been collected anywhere else, and they seem to be restricted at least to this ecoregion, and possibly to the specific type of grassland found in southern Misiones province. *Jollas oklanderae* n. sp. seems to endure mild changes in the habitat quality (low density and natural grassland cattle ranching) but it was not found at heavily grassed areas, nor other species frequently found together while sampling. With less than 1% of its total area protected, it is urgent to promote a sustainable use of this grasslands, to assure the long-term survival of this species and many other semi endemic species inhabiting this ecoregion.

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