

## **First Record of *Synargis gorpa* (Lepidoptera: Riodinidae) in the Pampean Grasslands of Uruguay**

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# FIRST RECORD OF *SYNARGIS GORPA* (LEPIDOPTERA: RIODINIDAE) IN THE PAMPEAN GRASSLANDS OF URUGUAY

**Additional key words:** Atlantic Forest, campos, endangered species, grasslands, Nymphidiini, Pampa, pastizales

The genus *Synargis* Hübner, [1819] comprises 28 species distributed from Mexico to southern Brazil, Uruguay and Argentina (Callaghan & Lamas 2004, Dolibaina et al. 2013). Hall & Harvey (2002) reviewed the taxonomy of the genus and proposed a first phylogenetic hypothesis. According to these authors, two synapomorphic characters in the eighth sternite define *Synargis*: 1) males with two long, narrow posterior projections with finely serrate tips; and 2) females with well sclerotized lateral margins and weakly sclerotized in the dorsal region. In general, *Synargis* species are associated with tropical lowland rain forest environments and forest edges (Callaghan 1986, DeVries 1997). An exception to this ecological pattern is the '*Synargis axenus* complex', a monophyletic lineage in the '*Synargis regulus*' species group (sensu Hall & Harvey 2002), which contains seven species restricted to open environments such as savannas, shrublands, and grasslands of South America (Fig. 1; Dolibaina et al. 2013).

Recently, Dolibaina et al. (2013) reviewed the taxonomy of the '*S. axenus* complex' and described

three new species. One of these new taxa is *Synargis gorpa* Dolibaina, Dias, Mielke & Casagrande, 2013. This rare species is known only from four male specimens from three localities, all of which are high elevation grasslands (900 m or higher) in southern Brazil, from Guarapuava (Paraná), Curitiba (Santa Catarina), and São Francisco de Paula (Rio Grande do Sul) (Dolibaina et al. 2013). This small butterfly is easily distinguished from other *Synargis* species by the pattern and color of the wings, with bright yellow-orange postmedial and medial bands on a deep black background, and devoid of a marginal band. Here, we provide the first record of *S. gorpa* in Uruguay, and describe and illustrate the previously unknown female. We also provide a map showing the updated geographic distribution of the species, extending its known range by over 700 km.

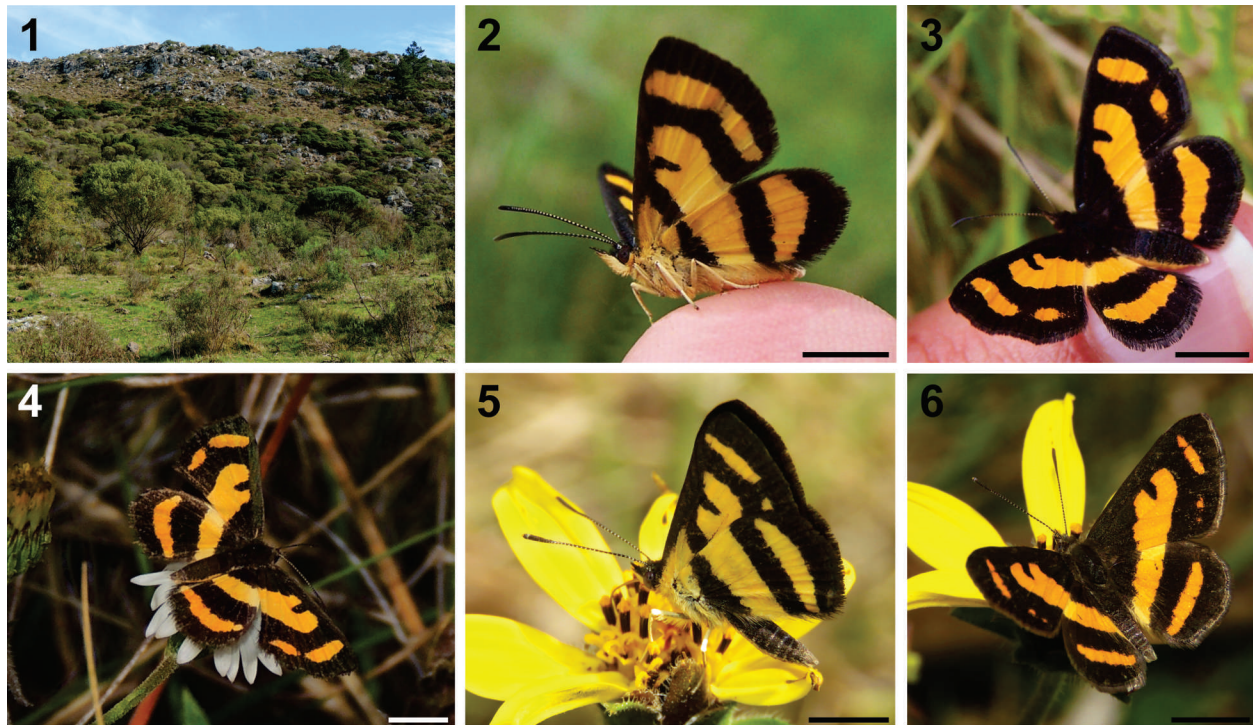
On 17 March 2007 one female of *S. gorpa* (Figs. 2–3) was observed for the first time in the peninsula of Punta Ballena (34°54'26.97"S, 55° 2'33.55"W, 6 m a.s.l.), Maldonado, Uruguay (this specimen was previously cited as *Synargis axenus* (Hewitson, 1876)

in Bentancur-Viglione 2009). Additional photographic records were found for four individuals: one female on 7 April 2016 (Fig. 4; 34°25'39.14"S, 55° 7'40.16"W, 221 m a.s.l.), and one male 14 December 2015 (Figs. 5–6; 34°28'4.78"S, 55°19'10.93"W, 290 m a.s.l.) in the vicinity of Minas, Lavalleja, Uruguay; two males on 24 March 2016 in San Carlos (34°45'12.67"S, 54°55'38.31"W, 23 m a.s.l.), and 2 April 2016 in Aiguá (34°15'36.44"S, 54°46'25.06"W, 149 m a.s.l.), Maldonado, Uruguay. Copies of the digital images are deposited in the database of the entomological Collection the Facultad de Ciencias, Universidad de la República (UDELAR), Montevideo, Uruguay (FCE). A review of the Lepidoptera deposited in this collection (FCE-LP), revealed two additional specimens of *S. gorpa* identified as *S. axenus*: URUGUAY, Maldonado, San Francisco, Piriapolis, 8.xii.1972, 1♂, (FCE-LP 246), 9.iii.1974, 1♂, (FCE-LP 245), A. Carmenes leg. The updated range (Fig. 7) of *S. gorpa* was also complemented with data obtained from Dolibaina et al. (2013).

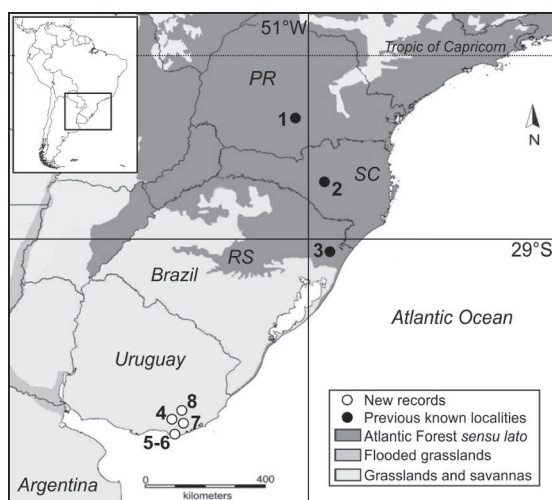
Feeding behavior was observed in the morning (12:40 h) and afternoon (16:00 h) on flowers of *Sommerfeltia spinulosa* (Spreng.) Less. and *Aspilia*

*montevidensis* (Spreng.) Kuntze (Asteraceae); the habitat where this species was found in Uruguay is typical remnants of native subtropical grasslands (Fig. 1). The female wing pattern and color is very similar to males in both dorsal and ventral surfaces, but the wing shape is rounder (Figs. 2–3). The body is dorsally black and laterally and ventrally yellow. The female forewing length is 13 mm ( $n = 2$ ).

A better knowledge on the ecology and geographical distribution of *S. gorpa* is fundamental to understanding the biogeography and evolution of the '*S. axenus* complex' and its transition from forests to open habitats. According to the morphology-based phylogeny proposed by Dolibaina et al. (2013), *S. gorpa* is the sister group of other species in the complex, with a wing pattern that is intermediate between other species in the '*S. regulus*' species group, which are associated with forested habitats. In this sense, the new records for Uruguay are potentially important for the biogeographic reconstruction because they show that the species may occur in grasslands at lower altitudes further south in the Pampa biome (known as campos in Brazil and pastizales in Uruguay). Until then, this species was



FIGS. 1–6. Habitat and adults of *Synargis gorpa*. 1, General aspect of the rocky grasslands in “Sierra de los Indios” near Minas, Lavalleja, Uruguay. 2–3, female in latero-ventral and dorsal view, respectively; 4, female feeding on flower of *Sommerfeltia spinulosa* (Asteraceae); 5–6, male feeding on flower of *Aspilia montevidensis* (Asteraceae) in latero-ventral and dorsal view, respectively. Scale bars = 0.5 mm. Photos (1–4) by F. Pérez-Piedrabuena, and (5–6) by G. Casás.



FIGS. 7. Map showing the eight known localities for *Synargis gorpa* in southern Brazil and Uruguay. The solid black circles represent the three previously known localities for *S. gorpa* (see Dolibaina et al. 2013), and open circles represent the five new localities in Uruguay. **1.** Guarapuava, Paraná (PR); **2.** Curitiba, Santa Catarina (SC); **3.** São Francisco de Paula, Rio Grande do Sul (RS); **4.** Minas, Lavalaja (LA); **5.** San Francisco, Maldonado (MA); **6.** Punta Ballena (MA); **7.** San Carlos (MA); **8.** Aiguá (MA).

known only from high elevation grassland mosaics associated with Araucaria forests in the Atlantic forest sensu lato. In Uruguay, two additional species are known in the '*S. axenus* complex', *Synargis bifasciata* (Mengel, 1902) and *Synargis ochrophlegma* (Stichel, 1911) (Dolibaina et al. 2013; M.G. Bentancur-Viglione, unpublished data). In the Maldonado region *S. gorpa* and *S. bifasciata* are found in sympatry.

The discovery of *S. gorpa* in Uruguay was made via photos posted on an image hosting website (Flickr), grouping images via "mariposas del uruguay" (see <https://www.flickr.com/groups/1693756@N23/>, last accessed [September 27, 2016]). This kind of initiative taken by nature enthusiasts, including both biologists and non-biologists, has grown in South America and has become a valuable source of new records (see Kaminski et al. 2015). Such 'Citizen Science' should be encouraged as a means of engaging people to know their local biodiversity and at the same time provide valuable information on the distribution and monitoring of Neotropical species.

The collection dates suggest that *S. gorpa* is bivoltine, with a spring (November–December) and a late summer generation (March–April). Collection specimen data plus our new records suggest that this

pattern is consistent over years. In Uruguay, distribution records are concentrated in the southwest, from mountainous sites in "Sierra de los Indios", "Sierra Carapé" and "Cerro de las Ánimas" near Minas, to sea level on the Maldonado coast. Despite these new distribution records, this riordinid species is still known only from few individuals and localities, being rare and potentially endangered with its occurrence restricted to natural grasslands. These South American open grasslands have historically been neglected from a conservation point of view in terms of recognition of their diversity and endemism (see Overbeck et al. 2007). Consequently, several endemic species in these ecosystems are threatened (Dolibaina et al. 2011; Siewert et al. 2014) or possibly extinct (e.g., Penz et al. 2011). Thus, we hope this brief report will encourage further studies on the ecology and evolution of this recently discovered grassland butterfly.

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