

# New records of Lepidoptera (Insecta) in altitudinal grasslands in state of Santa Catarina, Southern Brazil

*Novos registros de Lepidoptera (Insecta) em campos de altitude no estado de Santa Catarina, sul do Brasil*

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## ABSTRACT

There is a lack of knowledge regarding Lepidoptera species in altitudinal grassland areas, especially in the state of Santa Catarina, in southern Brazil. Here we report some records of *Vanessa braziliensis* (Moore, 1883) and *Urbanus zagorus* (Plötz, 1880) in high altitude areas. We have likely registered both the first record of *U. zagorus* for the state of Santa Catarina and the highest altitudinal record of *V. braziliensis* in Brazil.

**Keywords:** Bom Jardim da Serra; *Urbanus zagorus*; *Vanessa braziliensis*.

Recebido: 30 maio 2017  
Aceito: 8 jun. 2017

## RESUMO

Há pouco conhecimento referente às espécies de Lepidoptera em áreas campos de altitude, especialmente no estado de Santa Catarina, no sul do Brasil. Aqui nós apresentamos registros de *Vanessa braziliensis* (Moore, 1883) e *Urbanus zagorus* (Plötz, 1880) em áreas de grande altitude. Nós realizamos tanto o primeiro registro de *U. zagorus* no estado de Santa Catarina quanto o registro em maior altitude de *V. braziliensis* no Brasil.

**Palavras-chave:** Bom Jardim da Serra; *Urbanus zagorus*; *Vanessa braziliensis*.

## INTRODUCTION

Lepidoptera species are very efficient in pollinating, which contributes to the genetic diversification of flowers (HEPPNER, 2008; DUARTE *et al.*, 2012). Their presence or absence, diversity and quantity, may also be indicators of the degree of environmental conservation, and their study is of prime importance in understanding ecological interactions among several environments (DUARTE *et al.*, 2012; PIOVESAN *et al.*, 2014; ORLANDIN *et al.*, 2016).

The order corresponding to butterflies and moths has about 156,100 described species. However, there are estimates of the existence of approximately 255,000 species (HEPPNER, 2008). In Brazil, records demonstrate that there are about 26,000 species distributed among 71 families (DUARTE *et al.*, 2012). In the state of Santa Catarina, in southern Brazil, there is a record of 1,637 Lepidoptera species (PIOVESAN *et al.*, 2014; ORLANDIN *et al.*, 2016).

Natural grassland areas in the state of Santa Catarina originally occupied an equivalent area of 14.20% of this state, which amounted to an area of 13,543 km<sup>2</sup> (VIBRANS *et al.*, 2012). Currently there is no information regarding how modified these phytophysiognomy are. These areas are also poorly known in terms of their Lepidoptera diversity, which is reinforced by Piovesan *et al.* (2014) and Ferro *et al.* (2012).

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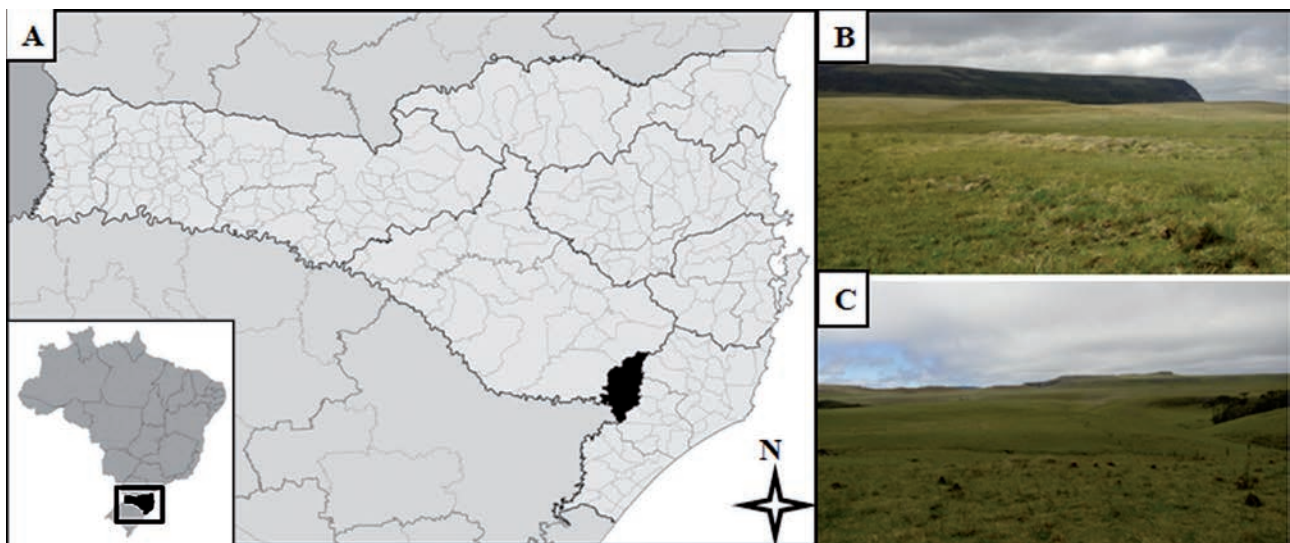
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Bom Jardim da Serra is a municipality which contains natural grassland and has a record of 27 species of Lepidoptera (PIOVESAN *et al.*, 2014). Similarly, the municipality of Urubici is also a part of this phytophysiology with 78 recorded species (PIOVESAN *et al.*, 2014). In contrast, for municipalities with forest phytophysionomies near coastal region, such as Joinville, 373 species are known (PIOVESAN *et al.*, 2014). Another example is Seara, a municipality located in the western region of the state, with 351 recorded species (PIOVESAN *et al.*, 2014). This data reflects the importance of obtaining knowledge regarding Lepidoptera records in natural grassland in Santa Catarina state and in southern Brazil, since there are just a few records in these areas. The aim of this research is to counteract the lack of knowledge about Lepidoptera in natural altitudinal grasslands in Brazil.

## MATERIAL AND METHODS

### STUDY AREA

The study area was natural grasslands in the municipality of Bom Jardim da Serra, located in the high plateau of the state of Santa Catarina in southern Brazil, a distance of 230 km (kilometers) from the sea (figure 1). The average altitude is of about 1,400 m (meters) above sea level. The average wind speed in Bom Jardim da Serra in 2016 was  $25.67 \pm 15.04$  km/h. The average maximum temperature was  $10.93 \pm 4.79^\circ\text{C}$  in 2016. In average, the minimum temperature in 2016 was  $9.88 \pm 4.65^\circ\text{C}$  (INMET, 2017).



**Figure 1** – Localization of Bom Jardim da Serra in Santa Catarina state, Brazil (black mark in A; adapted from Wikipedia); photographic characterization of the sampling area (B and C).

### METHODOLOGY

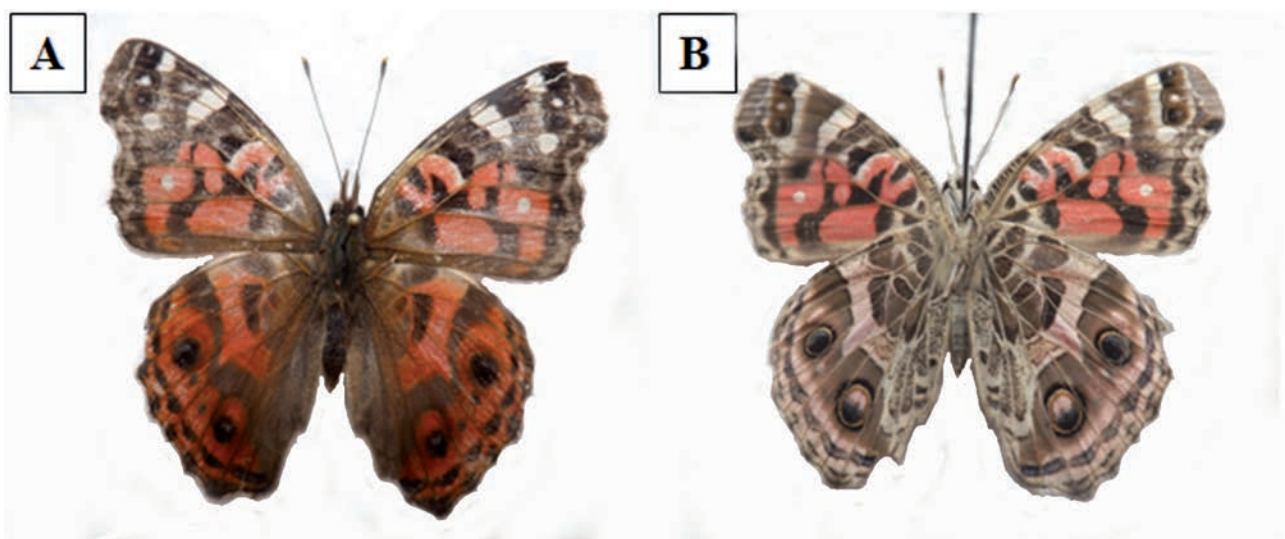
We carried out sampling on October 27, 28 and 29, 2016, and we covered about 25 km on foot in the natural grassland areas for data collection with an entomological net, totaling about 15 hours of sampling divided throughout the three sampling days. The measure of altitude was obtained with GPS Etrex Garmin.

## RESULTS AND DISCUSSION

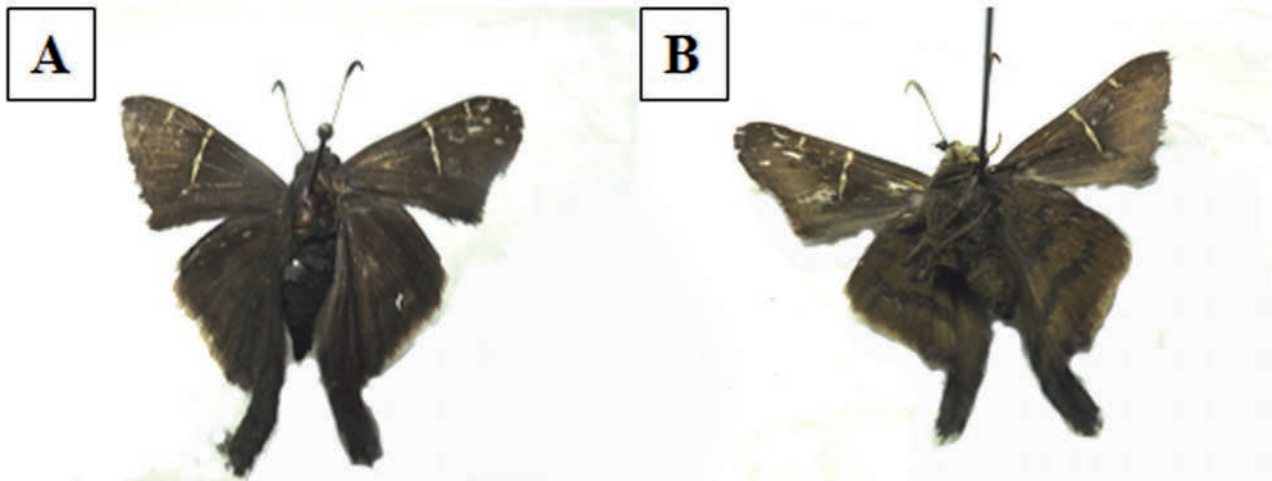
We recorded two species of Lepidoptera in the natural grassland areas, *Vanessa braziliensis* (Moore, 1883) and *Urbanus zagorus* (Plötz, 1880) (table 1; figures 2 and 3). The reason for not having collected other species is probably the high amount of wind on the sampling days, with winds exceeding speeds of 80 km/h. *Vanessa braziliensis* was recorded in seven places and *U. zagorus* in two places. For purposes of registration, we collected two specimens of *V. braziliensis* and one of *U. zagorus*, with the due collection authorization (Fatma AuA n. 7924/2016). There is no known record of *V. braziliensis* in Bom Jardim da Serra and the record of *U. zagorus* is probably the first record for the state of Santa Catarina as at least there are no current records published (ORLANDIN *et al.*, 2016).

**Table 1** – Geographical coordinates of Lepidoptera records in natural altitudinal grassland areas in the municipality of Bom Jardim da Serra, state of Santa Catarina, in Southern Brazil.

| Species                                   | Record coordinate                  | Altitude      |
|-------------------------------------------|------------------------------------|---------------|
| <i>Vanessa braziliensis</i> (Moore, 1883) | 28° 20' 59.70" S, 49° 33' 5.87" W  | 1416 m a.s.l. |
| <i>Vanessa braziliensis</i> (Moore, 1883) | 28° 21' 43.76" S, 49° 33' 56.75" W | 1414 m a.s.l. |
| <i>Vanessa braziliensis</i> (Moore, 1883) | 28° 21' 45.06" S, 49° 34' 2.29" W  | 1402 m a.s.l. |
| <i>Vanessa braziliensis</i> (Moore, 1883) | 28° 21' 14.62" S, 49° 33' 39.96" W | 1440 m a.s.l. |
| <i>Vanessa braziliensis</i> (Moore, 1883) | 28° 21' 45.99" S, 49° 34' 5.62" W  | 1396 m a.s.l. |
| <i>Vanessa braziliensis</i> (Moore, 1883) | 28° 21' 44.73" S, 49° 34' 12.32" W | 1388 m a.s.l. |
| <i>Urbanus zagorus</i> (Plötz, 1880)      | 28° 21' 44.73" S, 49° 34' 12.32" W | 1388 m a.s.l. |
| <i>Urbanus zagorus</i> (Plötz, 1880)      | 28° 22' 0.88" S, 49° 34' 19.26" W  | 1407 m a.s.l. |



**Figure 2** – *Vanessa braziliensis* (Moore, 1883): A) dorsal view; B) ventral view.



**Figure 3** – *Urbanus zagorus* (Plötz, 1880): A) dorsal view; B) ventral view.

*Urbanus zagorus* is considered a typical species of natural grasslands and has been recorded several times in the state of Paraná and once in the state of Rio Grande do Sul (BIEZANKO & MIELKE, 1973), having already been recorded in high altitude areas in the first state mentioned, whose sampling areas covered up to 1,680 m of altitude (DOLIBAINA *et al.*, 2011; CARNEIRO, 2012; BELTRAMI *et al.*, 2014). In this study we recorded this species in altitudes of up to 1,407 m a.s.l. and we saw this species near areas with streams places.

*Vanessa braziliensis* has a wide distribution, occurring in Brazil, Argentina and Venezuela. In this last country, this species has already been recorded in altitudes higher than 2,500 m (GIOVENARDI *et al.*, 2008; ISERHARD *et al.*, 2010; BARRIOS *et al.*, 2010; ROSA *et al.*, 2011; NÚÑEZ-BUSTOS & VOLKMANN, 2011; RITTER *et al.*, 2011; BELTRAMI *et al.*, 2014). In Brazil there is a possibility of a record of this species at up to 1,300 m of altitude in the municipality of Guarapuava, in the state of Paraná in southern Brazil by Dolibaina *et al.* (2011), however, the authors do not clarify the recorded altitude, only mentioning that samplings occurred in altitudes ranging from 470 to 1,300 m. Nevertheless, in this same state, Beltrami *et al.* (2014) recorded this species in areas of about 1,100 m of altitude.

In the state of Santa Catarina there were records of *V. braziliensis* only in lower altitudes (FAVRETTO *et al.*, 2015; ORLANDIN *et al.*, 2016), in this way our records have the highest altitudes in the state, covering up to 1,440 m, and it is possible that we have registered the highest altitude recorded in Brazil for this species, as we did not find any study reporting records in higher altitudes than the present study. This demonstrates the plasticity of this species in inhabiting inhospitable environments, with high-speed winds, with blasts of winds higher than 150 km/h (INMET, 2017). In our sampling days, we found this species moving only near the ground, which is probably an adaptation for the previously mentioned climate of the region, that is, this species searches for places where the wind has less impact.

### ACKNOWLEDGEMENTS

We are grateful to Elton Orlandin, from Universidade do Oeste de Santa Catarina and Eduardo Carneiro dos Santos, from Universidade Federal do Paraná, for confirming the identification of *Urbanus zagorus*.



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