

Nota Científica

First record of *Sphacelodes vulneraria* (Lepidoptera: Geometridae) damaging *Hovenia dulcis* in Brazil

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Abstract - *Hovenia dulcis* Thunb. (Rhamnaceae), popularly known as Japanese raisin tree, is commonly used in shading aviaries and pigsties in south Brazil. In this note, we report for the first time the occurrence of *Sphacelodes vulneraria* (Hübner, 1823) (Lepidoptera: Geometridae: Ennominae) damaging *H. dulcis* crops in Brazil and its potential as a new pest of this forest species.

Primeiro relato de *Sphacelodes vulneraria* (Lepidoptera: Geometridae) danificando *Hovenia dulcis* no Brasil

Resumo - *Hovenia dulcis* Thunb. (Rhamnaceae), conhecida popularmente como uva-do-japão, é comumente utilizada para sombreamento de aviários e chiqueiros no Sul do Brasil. É relatada pela primeira vez no Brasil a ocorrência de *Sphacelodes vulneraria* (Hübner, 1823) (Lepidoptera: Geometridae: Ennominae) danificando árvores de *H. dulcis*, e o seu potencial como nova praga desta espécie florestal.

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Hovenia dulcis Thunb. (Rhamnaceae), commonly known as Japanese raisin tree, and alternatively named as Japanese cherry tree or Chinese raisin tree, is an indigenous species from Eastern Asia, with natural occurrence from Japan, Korea and East China until the Himalayas up to 2000 m (Hyun et al., 2010). In East Asia, *H. dulcis* fruit is largely used for pharmaceutical and food supplementary purposes. However, *H. dulcis* is considered one of the most invasive species in subtropical forests in Brazil, including the Atlantic forest in the South region (Zenni & Ziller, 2011; Padilha et al.,

2015). The Japanese raisin tree is widely distributed in South of Brazil, with small plantation areas in farms in the states of Rio Grande do Sul, Santa Catarina and Southwest Paraná (Carvalho, 1994). However, in Santa Catarina, *H. dulcis* is considered an invasive alien species in western deciduous seasonal forest, as in mixed and dense Ombrophilous Forests. This species is grouped in category 2, which includes species whose management, rearing or cultivation is allowed under specific rules and conditions (Santa Catarina, 2016). Although its containment and control are required to avoid its spread

and dominance in native forests, *H. dulcis* is frequently found in the west part of Santa Catarina, where it is used for shading aviaries and pigsties (Cardoso et al., 2015).

Due to its high ability to acclimate to different weather conditions, there is a rising interest on cultivation and exploitation of *H. dulcis*, which is suitable for afforested crops and pasture, quickset, sawmill and energy production (Carvalho, 1994). This species is also a viable alternative for fermented/distilled beverage production or as raw material to produce bioethanol (Cancelier et al., 2013).

Information about the occurrence of pests in this plant species is rare. Until now, there are no reports of pests of major concern associated to Japanese raisin tree in USA (Gilman & Watson, 2014). However, in spite of the good adaptability to different regions, the Japanese raisin tree may be attacked by some insects that can prevent its growth and establishment. *Hishimonus sellatus* (Uhler, 1896) (Hemiptera: Cicadellidae), the leafhopper vector

of the Japanese raisin witches' broom phytoplasma, was reported on *H. dulcis* in South Korea (Kamala-Kannan et al., 2011). In Brazil, the longhorn beetles *Oncideres dejeani* (Thomson, 1868) and *O. saga* (Dalman, 1823) (Coleoptera: Cerambycidae) can damage young trees by feeding on branches and leaves (Carvalho, 1994).

This work report the first record of the moth *Sphacelodes vulneraria* (Hübner, 1823) (Lepidoptera: Geometridae: Ennominae) damaging *H. dulcis* in Brazil. Caterpillars from *S. vulneraria* were found infesting *H. dulcis* in November 2014 and in October and November 2015 in a farm located in the municipality of Ouro Verde (27°11'33" S, 52°39'29" W), in the western region of Santa Catarina State. These caterpillars caused intense defoliation of trees (Figure 1) that could potentially affect their growth and wood production as well as their aesthetic value. In the sampled area, all trees showed plant injury signals and, mostly of them, the entire leaf area was damaged.

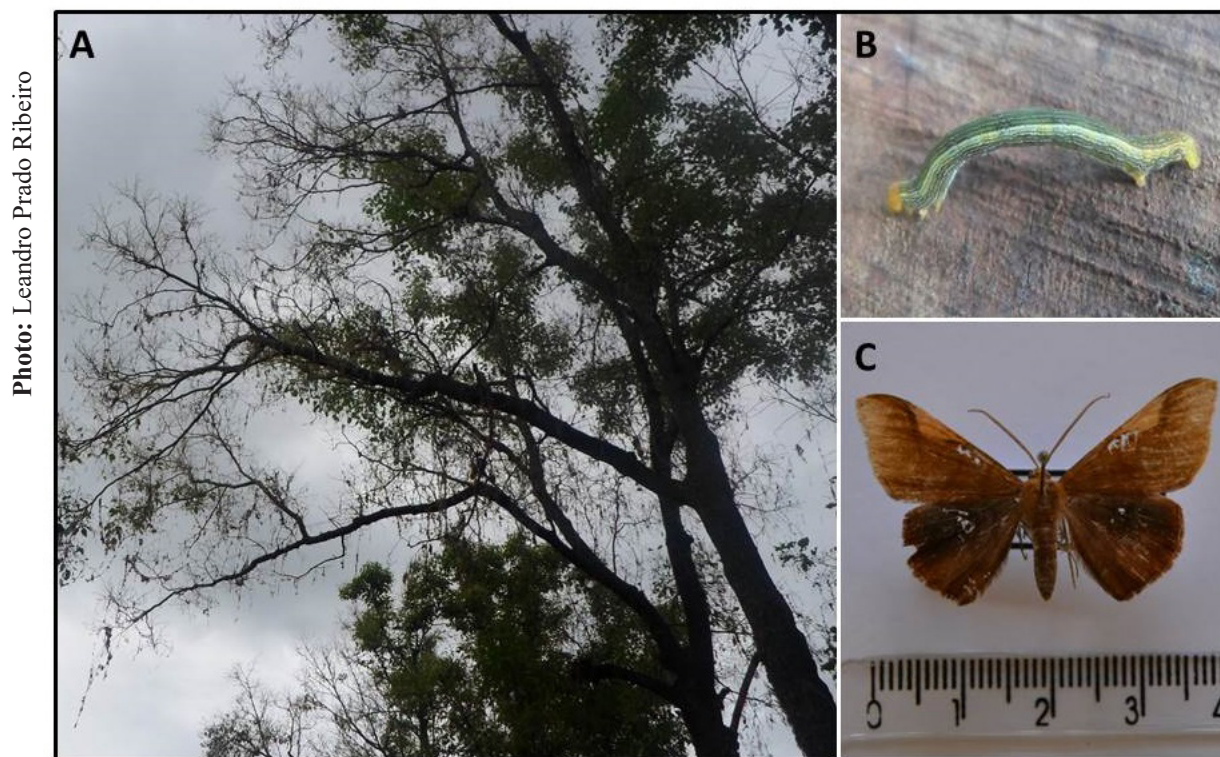


Figure 1. Plant injury in Japanese raisin tree (A), caterpillar (B) and moth (C) of *Sphacelodes vulneraria*.

In the laboratory, under controlled conditions (Temperature: 26 ± 2 °C, relative humidity: $70 \pm 10\%$ and photoperiod: 14 light:10 dark hours), the collected caterpillars were reared using leaves of Japanese raisin

tree. All the resulting adults were identified by Prof. Dr. Sinval Silveira-Neto ["Luiz de Queiroz" College of Agriculture/University of São Paulo (ESALQ/USP)] as *S. vulneraria*. None parasitoid was obtained from

the collected caterpillars. Voucher specimens were deposited at the Entomological Collection of Epagri/Cepaf, in Chapecó, SC, Brazil.

The Geometridae *S. vulneraria* is a Neotropical species widely distributed from the southern portions of United States to southern South America, including the countries in Central America (Holland, 1916; Rindge, 1973; Becker, 2002; Pitkin, 2002). In Brazil, *S. vulneraria* was recorded in different forest fragments composed by tree species such as *Tectona grandis* Linn. f. (Lamiaceae), *Ficus* spp. (Moraceae), *Astronium* sp. (Anacardiaceae), *Jacaranda copaia* (Aubl.) D. Don. (Bignoniaceae), *Syzygium jambolanum* (Lam.) DC. (Myrtaceae), and *Aspidosperma* sp. (Apocynaceae) in the municipality of Cotriguaçu, Mato Grosso State (Januário et al., 2013), as well as in forest recovery fragments and natural forest in the city of Botucatu, São Paulo State (Leitão-Lima, 2002).

Moths from subfamily Ennominae are likely to be a significant component of tropical forest-dwelling insects, whilst *S. vulneraria* tends to feed on host plants from family Rhamnaceae (Brehm, 2003). Caterpillars from the genus *Sphacelodes* spp. consume mainly leaves of trees and shrubs, although studies of the environmental impact of these insects are still incipient (Pitkin, 2002).

Conclusions

In this study we report the first record of occurrence of *Sphacelodes vulneraria* damaging the Japanese raisin tree in Brazil and its potential as a new pest of this forest species. Future efforts must focus on both monitoring the occurrence of *S. vulneraria* on *Hovenia dulcis* trees over the next years and quantifying its damage on this forest species as well as evaluate the incidence of natural enemies associated with this moth species in order to confirm the pest status of this insect on Japanese raisin tree. Also, bioecological and behavioral studies of *S. vulneraria* on *H. dulcis* are necessary for the implementation of an efficient and sustainable pest management strategy on attacked trees.

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