



Sinningia × *vacariensis* (Gesneriaceae) from Southern Brazil, the first natural hybrid described for the genus

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Abstract

In this paper we describe and illustrate *Sinningia* × *vacariensis* a naturally occurring hybrid between *S. lineata* and *S. macrostachya*, from rocky outcrops inside an Araucaria forest in Rio Grande do Sul, Brazil.

Resumo

Neste trabalho, descreve-se e ilustra-se *Sinningia* × *vacariensis*, um híbrido natural entre as espécies *S. lineata* e *S. macrostachya*, ocorrendo em afloramentos rochosos no interior da floresta com Araucária no Rio Grande do Sul, Brasil.

Key words: Gesneriaceae, rocky outcrop, hybridization, clade Dircaea

Introduction

Hybrids between species of the Gesneriaceae family are easy to produce and numerous crosses were obtained by horticulturists and plant growers as appears in the list kept by the Gesneriad society (http://www.gesneriadsociety.org/ir_ges/index.htm). Interspecific hybrids also have been used in an effort to delimit cenospecies and improve classification within the genus *Sinningia* Nees (1825: 297) (Clayberg 1996). Naturally occurring hybrids can also occur, but are rarely reported (Puglisi *et al.* 2011). In Brazil some hybridization events were strongly suspected, based on morphological observation in the field or on herbarium specimens for *Nematanthus* Schrader (1821: 718) (Araujo *et al.* 2005, Chautems 1988, Chautems & Kiyama 2003) and *Vanhouttea* Lemaire (1845: 346) (Chautems 2002, SanMartin-Gajardo 2005).

For *Sinningia*, a few examples of individuals intermediate between two parent species were observed in the field (Chautems, pers. obs.), but never formally registered or published. A first case is here documented involving two species of this genus that counts over 60 species of shrubs, sub-shrubs or tuberous herbs occurring in a broad range of geographic regions and growing under distinct ecological conditions (Araújo & Chautems 2012, Chautems 2010). Based on morphological studies of herbarium, living material and field studies, we describe a new hybrid species between *S. lineata* (Hjelmquist 1937: 302) Chautems (1990: 385) and *S. macrostachya* (Lindley 1828: 1202) Chautems (1990: 386), from rocky outcrops inside an *Araucaria* forest in Rio Grande do Sul, Brazil.

Sinningia × *vacariensis* Ferreira, Waechter & Chautems *nothosp. nov.* Fig. 1 A–F

Type:—BRAZIL. Rio Grande do Sul: Vacaria, Afloramento rochoso no interior da Floresta com Araucária, próximo ao Rio Pelotas, 28°12'42"S, 50°45'35"W, 660 m, 18 November 2012, G.E. Ferreira and C.Vogel-Ely 235 (holotype ICN, isotype G).

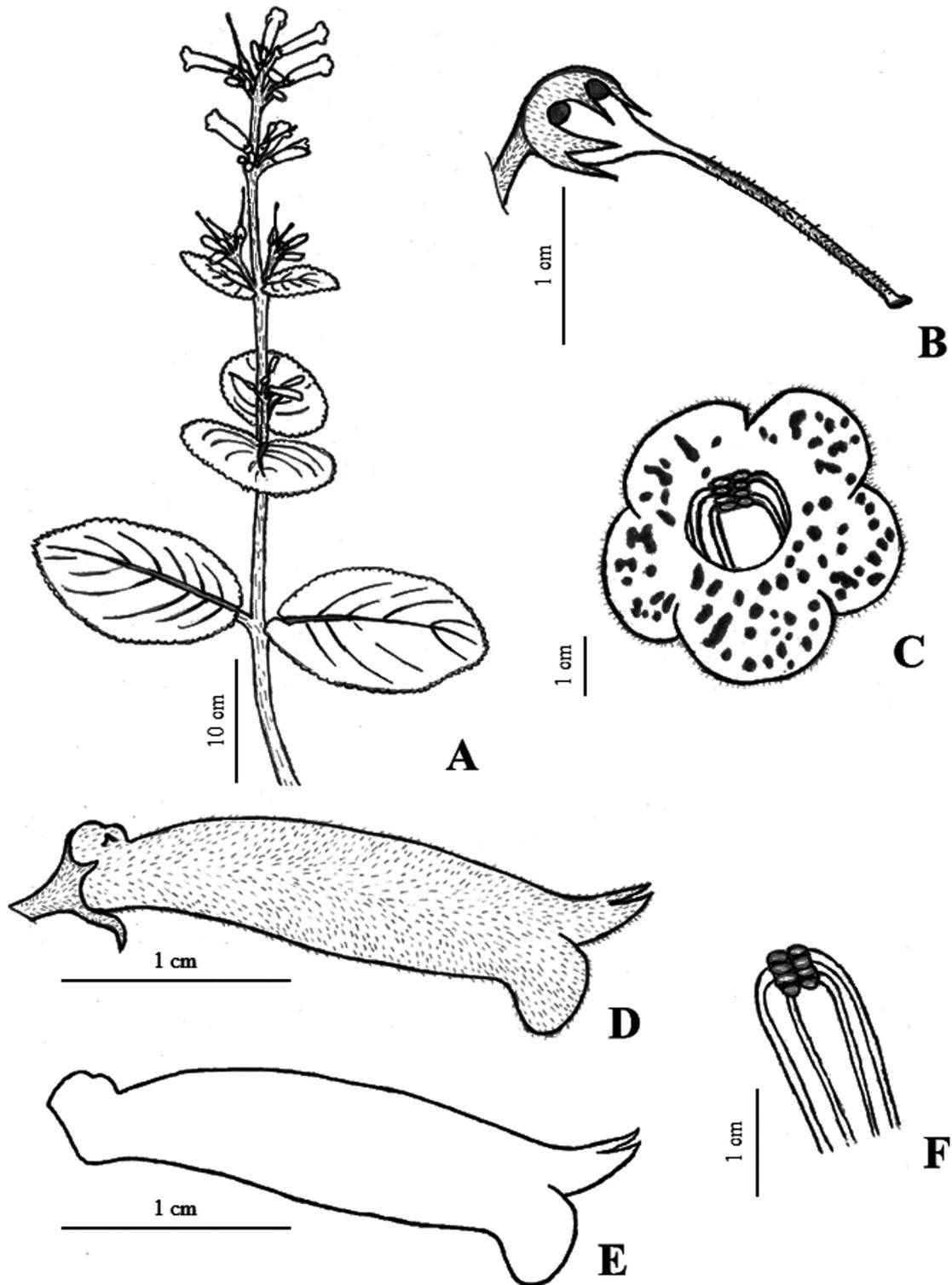


FIGURE 1. A–F. *Sinningia* × *vacariensis* (from the holotype). A. Habit. B. Ovary with calyx. C. Corolla opening, front view. D. Calyx with corolla. E. Corolla without calyx and trichomes. F. Anthers details with front view.

Plants rupicolous with erect stems arising from tubers; **Stems** 80–100 cm long, pilose, green with reddish streaks. **Leaves** opposite-decussate, subequal, petiole 1.5 cm long, tomentose, concolorous; blade ovate-elliptic, 8–15 cm long, 7–12 cm wide, obtuse at the apex, cordate or sometimes unequal at the base, margin irregularly crenate, 4–5 pairs of veins, above strigillose, below whitish-tomentose. **Inflorescences** cymose, composed of pair-flowered cymes, borne in the axils of bracts or upper leaf pairs over the ca. 30 cm long apex of the axis; peduncles 0.5–2 cm long, green with reddish streaks, hirsute; pedicels ascending 0.5–2 cm long, green with reddish streaks, hirsute. **Calyx** ovate, tube 2–3 mm long, hoary-tomentose, lobes linear-lanceolate, 4–6 mm long, acuminate, margin entire, green, pilose. **Corolla** erect in calyx, tubular, 2.5–3 cm long, red, pilose, base with 5 gibbosities between the calyx lobes, tube constricted above base, 3–4 mm wide, then expanding gradually to 5–7 mm wide at throat, limb spreading, lobes 5, with many dark red dots, unequal, ca. 4 × 4 mm; **Stamens** 4, included, filaments 2.9–3.2 cm long, glabrous, anthers coherent, rectangular, pollen white, nectary consisting of two separate dorsal glands; **Ovary** 6 mm long, 2 mm wide, hispid, style 2 cm long, green, pubescent. Fruit a dry two-valved capsule, 0.9–1.1 cm long, and 0.4–0.6 cm wide, acuminate, reddish brown, pubescent; seeds narrowly ellipsoid, brown.

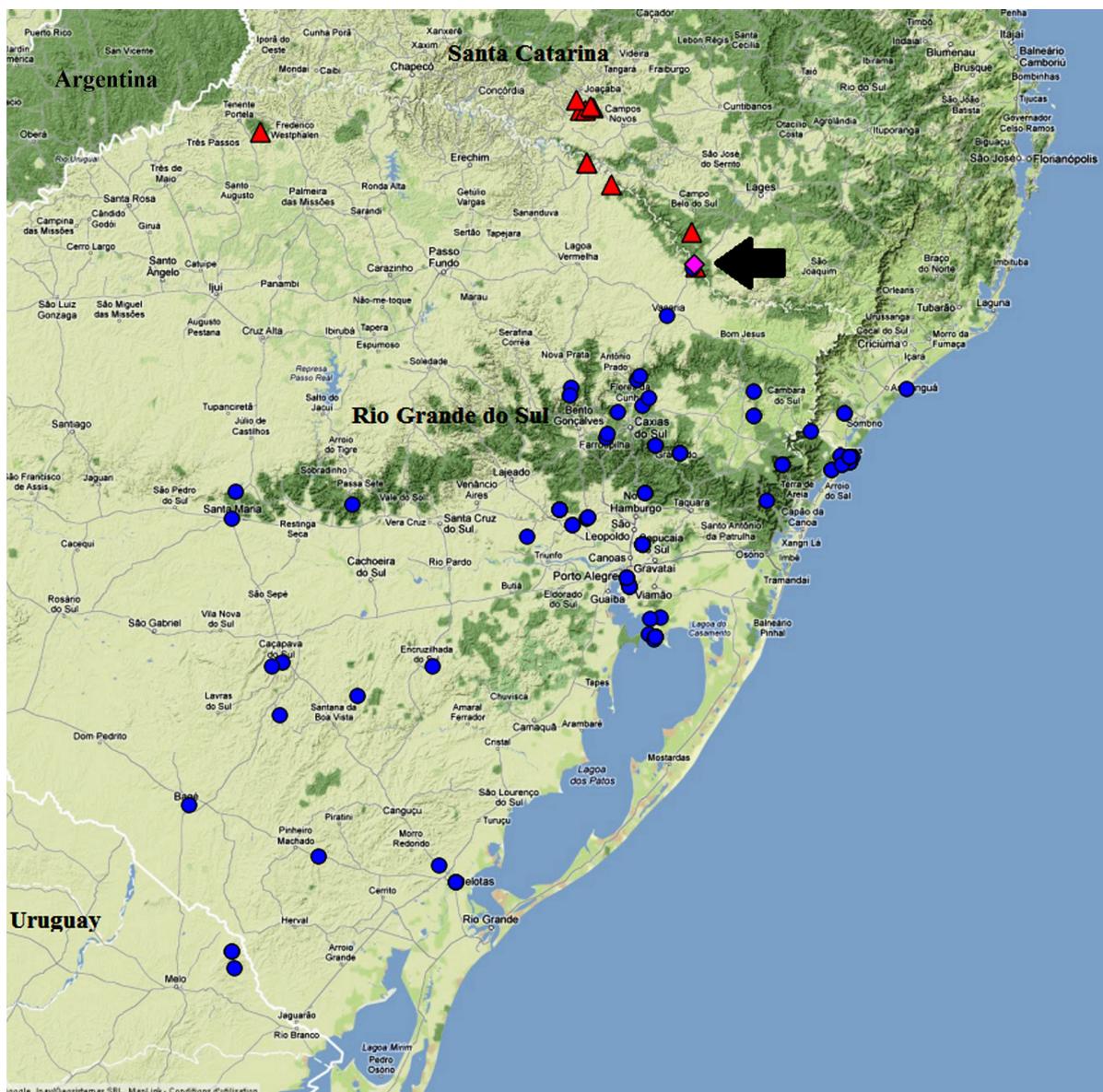


FIGURE 2. Distribution of *Simningia macrostachya*, *S. lineata* and *S. x vacariensis* in South America, showing the overlapping area. Blue circle. *S. macrostachya*. Red triangle. *S. lineata*. Pink lozenge. *S. x vacariensis*.

Distribution and habitat:—This hybrid occurs in the Vacaria municipality in Rio Grande do Sul, next to the Pelotas River. We located only one individual, growing on basaltic rock outcrops within an Araucaria forest, close to streams or in shaded habitats, between 600 and 800 m in elevation (Fig. 2).

Etymology:—The name of the nothospecies is derived from the municipality “Vacaria” where the plant was first encountered.



FIGURE 3. A–F. Comparison between the two species and the hybrid. A–B. *Sinningia macrostachya*. A. Habit. B. Detail of flower. C–E. *S. x vacariensis*. C. Habit. D. Detail of inflorescence. E. Detail of flower. F–G. *S. lineata*. F. Habit. G. Detail of flower.

Discussion

In the framework of a taxonomic and biogeographic survey of tribe Sinningieae in Rio Grande do Sul we came across a plant that drew our attention by its inflorescence and flower structure intermediate between *S. lineata* and *S. macrostachya*, (Fig. 3 A–F). Detailed observations led us to conclude that we had found a case of natural hybrid between these species.

As for morphological characters, *S. macrostachya* has opposite leaves, ovate to elliptic, 8–15 × 5–9.5 cm, petiole 2.5 cm, distributed in 4–7 whorls, (frondo)-bracteose florescence with cymes (Chautems & Weber 1999), peduncle up to 1 cm, corolla 2.8 cm, orange to red, with few vinose dots mostly on ventral and lateral lobes. *S. lineata* has opposite leaves, elliptical to ovate, 9.5–15 × 7–14 cm, disposed in 1–2 whorls, petiole 4.5 cm, shoot reduced to frondose florescence with a well-developed pair-flowered cymes (Chautems & Weber 1999), peduncle 7–15 cm, corolla 2.8–3.5 cm, orange to reddish, all lobes with vinose dots. *S. ×vacariensis* clearly presents morphological characteristics intermediate between the two species: leaves opposite-decussate, ovate to elliptic, 8–15 × 7–12 cm, distributed in 3 whorls, petiole 1.5 cm long, frondo-(bracteose) florescence with cymes, peduncle 0.5–2 cm long, corolla 2.5–3 cm long, lobes with vinose dots on ventral and lateral lobes and dark red dots on dorsal lobes.

S. macrostachya is a species that has a rather wide distribution in southern Brazil and a neighbouring area in Uruguay (Grela & Brussa 2005), occurring in sunny rock outcrops from sea level to an altitude of 1000 m, whereas *S. lineata* has a restricted distribution, occurring in shaded rock outcrops in the forests and steep slopes along the Pelotas, Canoas, Uruguay and Antas rivers. As both species inhabit different environments, the likelihood of hybridization can be considered as low. However, the hybrid *S. ×vacariensis* was collected where the areas of occurrence of the two species overlap, on a rocky outcrop within a forest, at the mouth of the Socorro River, which flows into the Pelotas River). At this site, the two habitats of both parental species are in close proximity (ca. 300 m). Probably this hybrid has originated from cross-pollination by hummingbirds, since the two species have the same pollination syndrome. This hybridization event is not surprising as the two parent species are phylogenetically closely related as inferred from their sister position within clade Dircaea in recent molecular studies (Perret *et al.* 2003, 2007).

Acknowledgements

We are grateful to Capes (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) for providing a scholarship to the first author, to Juliana Allgayer for her great help during the field expeditions, to Alan LaVergne for revising the text and to Dr. Mathieu Perret for kindly producing the distribution map. We are also grateful to the Editor and the Reviewer for their valuable suggestions on the submitted manuscript.

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