



Rediscovery, considerations about type locality and conservation of *Rhipsalis agudoensis* (Cactaceae) from the Brazilian Atlantic Forest

DIEGO RAFAEL GONZAGA¹, LUCAS MORAES^{2,3}, LUIZ MENINI NETO⁴ & ARIANE LUNA PEIXOTO^{1,5}

¹Escola Nacional de Botânica Tropical, Instituto de pesquisas Jardim Botânico do Rio de Janeiro, Rua Pacheco Leão 2040, Horto, CEP-22460-036, Rio de Janeiro, Rio de Janeiro, Brazil. E-mail: diego.gonzaga@gmail.com

²Centro Nacional de Conservação da Flora, Rua Pacheco Leão 915, Jardim Botânico, 22460-030, Rio de Janeiro, Rio de Janeiro, Brazil. E-mail: lucascmorales@gmail.com

³Universidade Federal do Rio de Janeiro, Instituto de Biologia, Departamento de Genética, Laboratório de Biologia Evolutiva, Teórica e aplicada, Ilha do Fundão, CEP 21941-617, Rio de Janeiro, Rio de Janeiro, Brazil.

⁴Centro de Ensino Superior de Juiz de Fora, Campus Arnaldo Janssen, Luz Interior 345, Santa Luzia, CEP 36030-776, Juiz de Fora, Minas Gerais, Brazil. E-mail: menini.neto@gmail.com

⁵Instituto de pesquisas Jardim Botânico do Rio de Janeiro, Rua Pacheco Leão 915, Horto, 22460-030, Rio de Janeiro, Rio de Janeiro, Brazil. E-mail: ariane@jbrj.gov.br

Cactaceae Juss. is a family comprising 124 genera and about 1438 species which are distributed from Canada to Patagonia, with the largest diversity in tropical and subtropical America (see *e.g.*, Hunt *et al.* 2006). The flora of Brazil include 39 Cactaceae genera and 261 species, of which 14 genera and 54 species can be found at Rio de Janeiro state, so showing its importance for the biodiversity of cacti (BFG 2015).

The species are highly affected by anthropic disturbances, which causes rapid destruction of their habitats, especially concerning the narrow endemic taxa, with 31% of the family being threatened, demonstrating the high anthropogenic pressures on the biodiversity in arid lands (Goettsch *et al.* 2015).

Rhipsalis Gaertner (1788: 138) is distributed in tropical and subtropical America. The only species in this genus, that occurs natively outside the Americas (Africa, Sri Lanka, and Madagascar), is *R. baccifera* (Solander 1771: 95) Stearn (1939: 107). *Rhipsalis* is the richest genus of South American epiphytic cacti, having a centre of distribution in Eastern Brazil (Hunt *et al.* 2006), and also being the richest genus of the family in Brazil, with 37 mainly epiphytic or epipetric species (BFG 2015).

From the morphological point of view, *Rhipsalis* is characterized by: branching more or less strictly acrotonic, stem-segments of indeterminate growth, or more commonly some or all of determinate growth (i.e. having reached a certain predetermined average size, growth ceases and a new order of segments begin development), old or diseased segments deciduous by means of well-defined abscission zones at the joints, terminal composite areoles present or absent; flowers lateral or terminal, pericarpel and young fruit terete and naked [except *R. pilocarpa* Loefgren (1915: 68–69)] and with rare exceptions, perianth-segments sometimes reduced in number to only 5–6, somewhat whitish or rarely yellowish [red only in *R. hoelleri* Barthlott & N.P.Taylor (1995: 50)]; fruit white or coloured, but never conspicuously veined, perfectly terete (never angled) when ripe (Barthlott & Taylor 1995).

Rhipsalis agudoensis N.P.Taylor (2003: 12) was first described by Nigel P. Taylor who pointed out differences between the cultivated specimens in living collections at the University of Bonn in comparison with others *Rhipsalis* species. *R. agudoensis* is similar to the *R. cereoides* (Backeberg & Voll 1935: 411) Backeberg (1937: 39) and *R. russellii* Britton & Rose (1923: 321–323), and it was previously mentioned under *R. pachyptera* Pfeiffer (1837: 132); see Barthlott & Taylor (1995). To date, it is known from a single site and collection attributed to Agudo, in the centre of the state of Rio Grande do Sul (Taylor 2003). However this species probably had their location labels replaced by collectors (*Horst et Uebelmann* 821, Herb. K), since N.P. Taylor carried out expeditions to the municipality of Agudo, and was not successful in finding it (N.P. Taylor, pers. comm.). Machado (2009) treated this species as a rare plant to Brazil, while Carneiro *et al.* (2016) did not mention *R. agudoensis* to the State.

Specimens from the Parque Nacional do Itatiaia, and from the district of Penedo, municipality of Itatiaia were collected, georeferenced, photographed and deposited in the herbarium RB. We also examined collections from herbaria with representative collections from Serra da Mantiqueira (BHCB, CESJ, GUA, MBML, R, RB, SPF, UEC, VIC and VIES; acronyms according to Thiers 2016+), but no additional specimens referable to *R. agudoensis* were found.

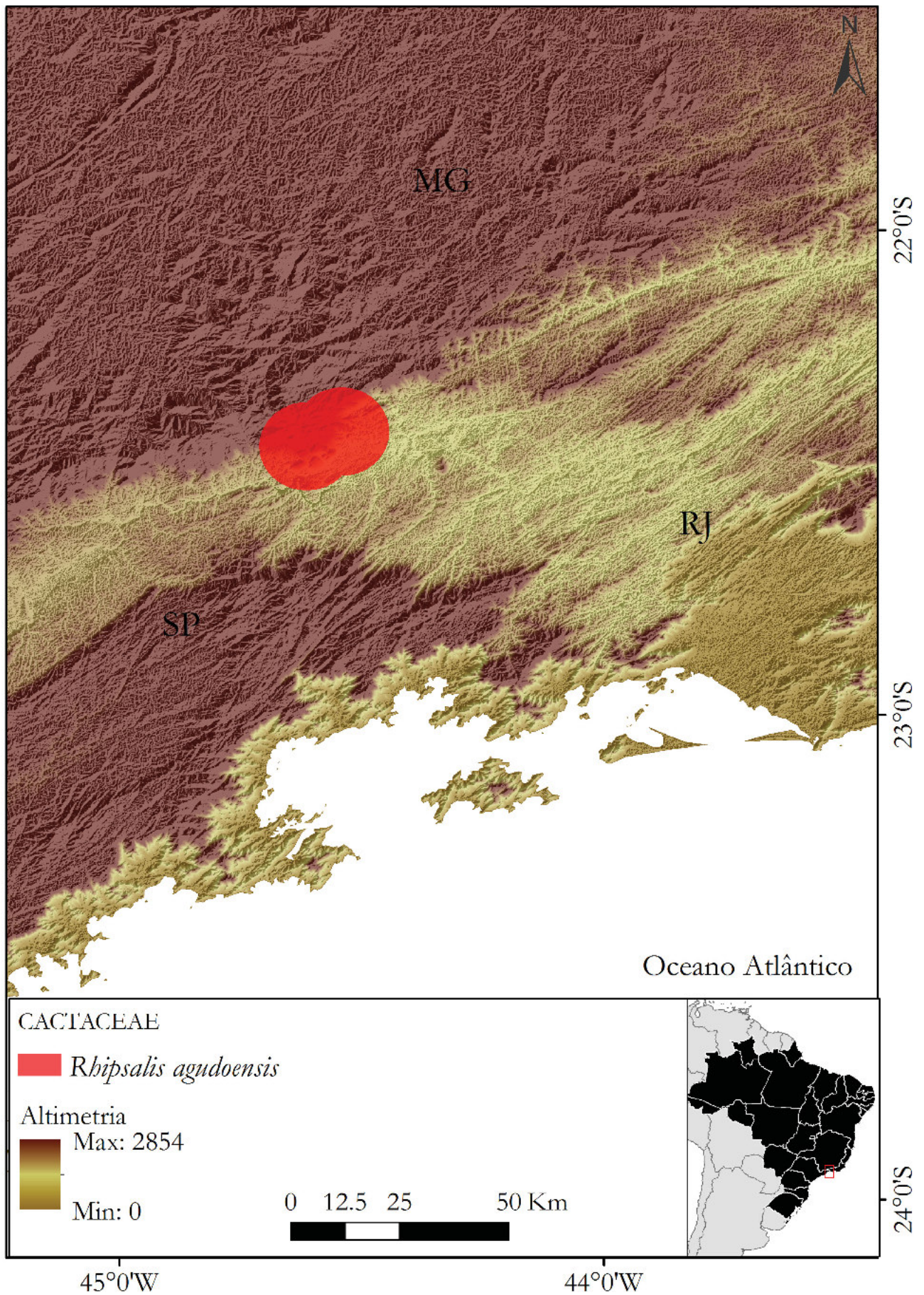


FIGURE 1. Distribution map of *Rhipsalis agudoensis*.

Rhipsalis agudoensis N.P. Taylor, Cactaceae Syst. Init. 16: 12. 2003 (Fig. 2)

Type:—BRAZIL. Rio Grande do Sul: Agudo, Cultivated in Bonn, June 2003, *Horst & Uebelmann 821* (holotype K!, image of the holotype available at <http://apps.kew.org/hercat/getImage.do?imageBarcode=K000372524>).

Description:—*Epiphyte*, pendent; stem-segments, green, oblong, ribs 3–4, 1.2–1.7 cm long, ramification apical of growth determinate, 1–2-branched, 14.5–16.0 × 2.2–2.5 cm, glabrous, crenate margin, areoles about 2 mm diameter, 2.1–4.9 cm apart, pubescent to glabrous. *Floral buds* develop on the surface of the branches, cream, glabrous. *Flowers* about 5 × 10–14 mm long, 1–6 per areole, white to cream, bright; pericarpel 3–4 × 3 mm, emersed, green, oval; perianth segments about 10, tinted of rose, the external 1–2 × 2 mm, triangular, cream, the internal 3–7 × 2–4 mm, white, oblong, oval to lanceolate; stamens 59–88, white, 2–5 mm long; style 4–5 × 1 mm long, stigma about 2 mm long, white, 4–8-lobed, lobe about 1.5 × 1.0 mm, papillose. *Fruits* globose, truncated, hairless, rose to white, about 4 × 5 mm, perianth-segments persistent; *seeds* brown to black, elliptical about 1.5 × 1.0 mm.

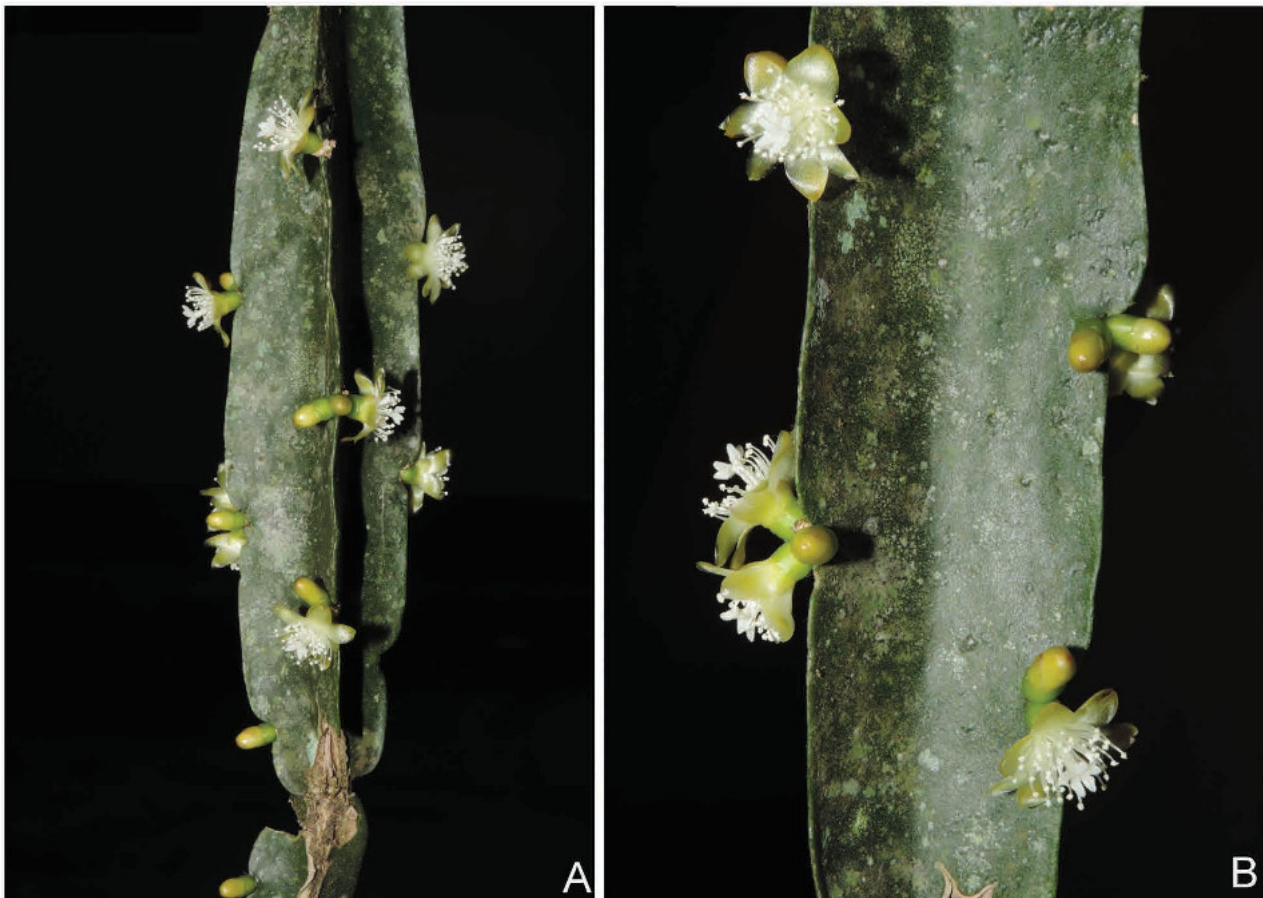


FIGURE 2. *Rhipsalis agudoensis*. A) Stem with floral bud and flowers; B) Flowers in details (photos by D.R. Gonzaga).

Proposed vernacular name:—Cacto-triangular (= Triangle-shaped cactus)

Distribution and habitat:—Brazil, Rio de Janeiro, Parque Nacional do Itatiaia, municipality of Itatiaia (Fig. 1), as epiphyte in dense ombrophilous forest, at 800 m a.s.l., and district of Penedo (municipality of Itatiaia), distant about 9 km in a straight line from the first record. The specimens of this second record inhabit trees in an urbanized region, leading to a greater risk of habitat loss by predatory collection, replacement of trees and real estate expansion. There is another unconfirmed record, in the municipality of Três Rios, also in the Rio de Janeiro state, for an individual that did not show up fertile for one year already, with vegetative characteristics similar to *Rhipsalis agudoensis* (N.P. Taylor, pers. comm.)

Phenology:—Flowering time April–May, fruiting time August.

Conservation status:—Larocca & Taylor (2013) treated *Rhipsalis agudoensis* as “Data Deficient” (DD; see IUCN 2016), due to the existence of only the type-specimen. The study carried out by Goettsch *et al.* (2015), that presented the assessments of all world cacti, also considered the species as “Data deficient” (DD). However, the collection of *R. agudoensis* (Fig. 1) in the Parque Nacional do Itatiaia and Penedo district, both in the Itatiaia municipality (Rio de Janeiro state), allow us to define the conservation status. On the basis of the IUCN criteria and categories (IUCN 2012), *R. agudoensis* is here

assessed as “Endangered” (EN) [criterion B2ab(ii,iii,iv,v)], the AOO of 8 km² (Moraes 2016). The species is threatened by the recurrent occurrence of human induced fires inside the Parque Nacional do Itatiaia (Aximoff 2011), where intense tourism also pose a threat (Barros 2003). The expressive industrial activities in the Itatiaia municipality also represent a threat, since it is responsible for the degradation of the area’s natural vegetation (Castro 2001). Therefore, the species is subjected to continuing decline of its AOO, habitat quality, number of locations and number of mature individuals, justifying the subcriteria used in the assessment.

Material examined:—BRAZIL. Rio de Janeiro: Itatiaia, Parque Nacional do Itatiaia, 21 October 2014, *Gonzaga D.R. et al.* 358 (RB!); 20 March 2015, *Gonzaga D.R. et al.* 523 (RB!); Itatiaia, Penedo, 14 May 2016, *Gonzaga D.R. et al.* 682 (RB!).

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