Notes on *Stigmaphyllon* (Malpighiaceae) from Southeastern Brazil

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ABSTRACT: New data on two Atlantic Forest endemic and endangered species of *Stigmaphyllon* (Malpighiaceae) are provided. We present an amended description of *Stigmaphyllon crenatum*, including leaf morphology variation, and new details of floral and fruit morphology, the latter described for the first time. We extend the distribution range of *Stigmaphyllon vitifolium* into Espírito Santo State.

Keywords: Atlantic Forest, Espírito Santo State, Malpighiales, *Ryssopterys*, *Stigmaphyllon*, Taxonomy.

RESUMO: (Notas sobre *Stigmaphyllon* (Malpighiaceae) do Sudeste do Brasil) Novos dados sobre duas espécies de *Stigmaphyllon* (Malpighiaceae) endêmicas e ameaçadas da Floresta Atlântica são apresentados. Incluímos uma redescrição de *Stigmaphyllon crenatum*, abrangendo a variação morfológica de folhas, e novos detalhes sobre a morfologia floral e do fruto, este último descrito aqui pela primeira vez, e ampliamos a distribuição geográfica de *Stigmaphyllon vitifolium* para o estado do Espírito Santo.


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Introduction

*Stigmaphyllon* A.Juss. comprises about 120 species occurring within the neotropics, West Africa, Southeast Asia, Western Australia and Pacific Islands (Almeida & Amorim 2014; Anderson 2011). Most species are woody vines with long-petiolate, elliptical to cordate leaves, clusters of yellow flowers arranged in dichasia, styles with lateral foliar appendages at the apex, and schizocarpic fruits splitting into three mericarps, each usually with a large dorsal wing (Anderson 1997). This genus is currently divided into two subgenera, *Stigmaphyllon* with 93 species restricted to the Neotropics, including 47 species in Brazil, and *Ryssopterys* Blume ex A.Juss. with 20 species restricted to Southeast Asia and Oceania (Anderson 2011). Both subgenera were regarded separately by different authors in the past (e.g., Anderson 1997; Niedenzu 1928), but recent phylogenetic studies revealed them to be congeneric (Davis & Anderson 2010). Monographs for both groups were presented by Anderson (1997, 2011).

In Brazil, *Stigmaphyllon* is especially diverse in forested habitats, occurring mostly along water streams in the Amazon and Atlantic Forests (Anderson 1997; Almeida & Amorim 2014). Southeastern Brazil constitutes much of its range located within remnants of Atlantic Forest, a hotspot for conservation priorities (Mittermeier et al. 2005). In recent years, field trips in this region, especially in poorly collected areas in the states of Espírito Santo and Minas Gerais, have contributed to the understanding of enigmatic species in Malpighiaceae (Almeida & Amorim no prelo; Amorim & São-Matheus 2008; Sebastiani & Mamede 2010).

Recent collections from RB and VIES herbaria (herbarium acronyms follow Thiers 2015) revealed a new information for two endangered species of *Stigmaphyllon* in the Atlantic Forest of Southeastern Brazil. We here extend the distribution range of *Stigmaphyllon vitifolium* A.Juss. into Espírito Santo State, and present an amended description of *Stigmaphyllon crenatum* C.E.Anderson, including the description for the first time of fruit and complete floral morphology.

**Material & Methods**

This work is based on the study of new collections from recent fieldtrips (2014) in Espírito Santo State, and on herbaria collections of *Stigmaphyllon* deposited in ALCB, CEPEC, CESJ, CVRD, GUA, HUEFS, MBM, MBML, R, RB, SP, SPF, UEC and VIES (herbarium acronyms follow Thiers 2015). All collections were studied using a stereomicroscope, specialized literature on the
family (Anderson 1997; Niedenzu 1928), and consulting type specimens (or images of them). The description of *Stigmaphyllon crenatum* were additionally based on Anderson (1997). A map was elaborated using ARCGIS software (Environmental Systems Research Institute 2010) and geographical coordinates were retrieved from Anderson (1997) and herbarium specimens.


**Typus:** BRAZIL. Espírito Santo: Rio Pancas, Aldeiamento dos Índios, 11 July 1942, *Buena 156* (holotype: R!).

**Taxonomy.** Erect to scandent shrubs, up to 1.5 m, xylopodium present. Stems and branches terete, striated, sericeous when young, soon becoming glabrous; lenticels inconspicuous. Stipules absent. Leaves opposite, subsessile, reduced to filiform leaves in inflorescences; lamina 5.5–18 × 4.5–13.6 cm, broadly elliptical, ovate, suborbicular or orbicular, apex obtuse or emarginate or emarginate-mucronate or mucronate, base truncate, rounded or cordate, in young leaves densely sericeous adaxially and densely pubescent with floccose T-shaped hairs abaxially (trabecula 0.5–1.1 mm long, straight or wavy, stalk 0.1–0.2 mm long), the older laminas glabrescent to glabrous on both sides, margin deeply crenate, each sinus with an orbicular flush gland, 0.7–1.7 mm in diameter, venation brochidodromous, primary and secondary veins reddish. Petioles up to 5 mm long, canaliculate, sericeous to glabrous, not confluent across the node, with a pair of glands borne at apex, each gland 1.3–2.5 mm in diameter. Inflorescence terminal, umbels 4–10-flowered, these solitary or borne in dichasia or compound dichasia or reduced thyrses (axes to the 3rd order, sericeous); peduncles 4–10 mm long, sericeous; pedicels 6–9 mm long, distally expanded, sericeous; bracts 0.8–1.5 × 0.8–1.5 mm, broadly triangular to ovate, apex acute, sericeous abaxially, spreading; bracteoles 1–1.5 × 0.8–1 mm, triangular to ovate, apex obtuse, eglandular or each bracteole with a pair of inconspicuous glands (each gland 0.2–0.3 mm in diameter), sericeous abaxially, spreading. Sepals 2–3 × 2–2.5 mm, glands 1.5–2.3 × 1–1.5 mm, apex rounded, glabrous adaxially and sericeous abaxially. Petals yellow, sometimes with a reddish macula in the posterior petal; lateral petals with the limb orbicular, margin erose, 7.5–14 × 7.5–14 mm, claw 1.5–3.5 × 0.5–0.5 mm; posterior petal with the limb orbicular, margin denticulate, denticulous grandular, 8.5 × 8 mm, claw canaliculate, 4 × 1 mm. Stamens unequal, anthers of those opposite the anterior lateral sepals with the connective enlarged, glandular, and the locules reduced; all anthers loculate, glabrous. Stamen opposite anterior sepal: filament ca. 2.5 mm long, anther ca. 1mm long; stamens opposite anterior-lateral petals:
Fig. 1. *Stigmaphyllon crenatum*: Image A. by Ludovic Kollman. Images B-E. by Renato Goldemberg. A. flowering branch, B. inflorescence, C. two flowers, reddish flower buds, and leaves subtending the inflorescence, D. flower, E. habitat in *Inselbergs* within remnants of Seasonally Dry Forests in Espírito Santo state.
filaments ca. 2 mm long, anthers 0.9–1 mm long; stamens opposite anterior-lateral sepals: filaments 3.2–3.5 mm long, connectives ca. 1 mm long, locules 0.7–0.8 mm long; stamens opposite posterior-lateral petals: filaments ca. 3 mm long, anthers ca. 1.2 mm long; stamens opposite posterior-lateral sepals: filaments ca. 2.6 mm long, anthers ca. 1 mm long; stamen opposite posterior petal always shorter than the adjacent two: filament ca. 2 mm long, anther ca. 1 mm long. Anterior style ca. 2 mm long, shorter than the posterior two, terete proximally, laterally flattened in the distal 1/4, glabrous, erect; apex ca. 2 mm long including a spur ca. 1 mm long, ca. 0.4 mm wide, linear, foliololes reduced. Posterior styles 2.5–3 mm long, terete, with scattered hairs in the proximal 1/4, lyrated; foliole 1.2–1.5 mm long and wide, parabolic to triangular. Schizocarp splitting into three winged mericarps, dorsal wing trapezoidal, 1.5–2.5 × 1–2 cm, reddish, sparsely sericeous; nut 7–8 × 4–5 mm, prominent, greenish, smooth, sericeous. Seeds [not seen].

**Distribution and habitat.** *Stigmaphyllon crenatum* occurs only on rock outcrops (commonly known as *inselbergs*) associated to Seasonally Dry and/or Rain Forests in the States of Espírito Santo and Minas Gerais (Almeida et al. 2013).

**Phenology.** Flowering from October to April and fruiting in September.

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**Fig. 2.** *Stigmaphyllon crenatum*: A. petals, posterior petal at top, B. sepal, C. androecium, fifth stamen from left opposing posterior petal, D. gynoecium, anterior style in center E. samaroid schizocarp. (*Magnago* 1348!).
Conservation status. According to Almeida et al. (2013), this species is regarded as endangered.


Notes. Stigmaphyllon crenatum C.E.Anderson is an endemic and endangered species that was described from three incomplete collections from Espírito Santo State (holotype Buena 156 (R), and paratypes Duarte 4000 (RB), Kuhlmann 6651 (RB)) (Anderson 1993, 1997). The original description lacked information about the complete androecium, posterior (flag) petal, and fruits (Anderson 1993). Anderson (1993, 1997) differentiated *S. crenatum* from similar species mostly on the basis of the singular leaf morphology, i.e., sessile leaves with crenate margins bearing a gland at the base of each sinus. Her description is here amended to include details of corolla, androecium, and samara characteristics, which are taken from additional collections.

*Stigmaphyllon vitifolium* A.Juss., Fl. bras. mer. 3: 50. 1833.


Distribution and habitat. *Stigmaphyllon vitifolium* A.Juss. is a vine from the Brazilian Atlantic Forest, endemic to lowland forests and *restinga* vegetation in the State of Rio de Janeiro (Anderson 1997; Mamede et al. 2015). Most of the collections are historic, with the most recent ones dating from ten years ago (*Ferreira 265 - RB*) in an area strongly altered by human activities in the
municipality of Niterói, State of Rio de Janeiro. Almeida and Mamede (2014) presented an updated checklist for Malpighiaceae in Espírito Santo State, but the authors did not report any collections of *Stigmaphyllon vitifolium* for this area. Yet, during our additional field trips in poorly collected areas in the municipality of Guarapari, Espírito Santo State, we found a new locality for this species, extending its range of distribution into this State (Figure 3).

Fig. 3. Distribution map of *Stigmaphyllon crenatum* (triangles) and *S. vitifolium* (circles) in Southeastern Brazil.
Fig. 4. *Stigmaphyllum vitifolium*: A. habit, B. detail showing glands on the petiole, C. flower, D. habitat within *restinga* vegetation in Espirito Santo state (*Dal Col 2331*).
Phenology. Flowering in December.

Conservation status. According to the International Union for Conservation of Nature (2014) we can categorize *Stigmaphyllon vitifolium* as critically endangered, by its extent of occurrence less than 5,000 km² and by its severely fragmented area of occupancy and continuous decline in habitat quality along restinga vegetation.


Notes. This species is easily recognized by its leaves with lamina palmately 3-5-lobed, each lobe with mucronulate lobules at margin, veins usually reddish adaxially, small 8-10-flowered umbels, and fruits laterally compressed (Figure 4).

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Literature Citated


Almeida, R. F. & Mamede, M. C. H. 2014. Checklist, conservation status, and sampling effort analysis of Malpighiaceae in Espírito Santo State,