

Two new species of *Janusia* (Malpighiaceae) from Brazil

Renata Sebastiani^{1,2,4} e Maria Candida Henrique Mamede³

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ABSTRACT - (Two new species of *Janusia* (Malpighiaceae) from Brazil). Two new Brazilian species of *Janusia* are described and illustrated: *Janusia diminuta*, restricted to the Restinga vegetation in Northern Rio de Janeiro State; and *Janusia paraensis*, which is known from the Amazonian savanna vegetation in Pará State. Their diagnostic features are pointed out and a discussion of their relations to other species of *Janusia* are provided herewith.

Keywords: Amazonian savanna, Restinga vegetation, taxonomy

RESUMO - (Duas novas espécies de *Janusia* (Malpighiaceae) do Brasil). Duas novas espécies brasileiras de *Janusia* são descritas e ilustradas: *Janusia diminuta*, que é conhecida para a Restinga do norte do Estado do Rio de Janeiro; e *Janusia paraensis*, conhecida para áreas de savana amazônica do Estado do Pará. Neste trabalho são fornecidos aspectos diagnósticos e suas relações com outras espécies de *Janusia*.

Palavras-chave: Restinga, savana amazônica, taxonomia

Introduction

Janusia A.Juss. comprises 15 species and is mostly a Brazilian genus, predominantly found in dry areas (Cerrado, Caatinga vegetation, Restinga vegetation, and rocky outcrops, Sebastiani 2010). *Janusia* is nested within the tribe Gaudichaudieae, along with *Aspicarpa* Rich., *Camarea* A.St.-Hil., *Cottisia* Dubard & Dop, and *Gaudichaudia* Kunth. Such tribe is characterized by the reduction of the androecium and gynoecium and the presence of cleistogamous flowers (Davis *et al.* 2002). *Janusia* is characterized by five or six fertile stamens and a 3-carpellate gynoecium with a single gynobasic style (Sebastiani 2010), but only *J. guaranítica* (A.St.-Hil.) A.Juss. and *J. schwannioides* W.R.Anderson present cleistogamous flowers.

According to phylogenetic analysis performed by Davis & Anderson (2010), the genus *Janusia* is not monophyletic, because *Aspicarpa*, *Gaudichaudia* and *Janusia* species appear mixed in a well supported clade.

During the taxonomic study of *Janusia* (Sebastiani 2010), a new species from Restinga vegetation in Rio

de Janeiro State, and another one from the Amazonian savanna of Pará State were firstly found.

Results and Discussion

1. *Janusia diminuta* R.Sebast. & Mamede sp. nov.
Figure 1

Species Janusiae anisandrae et Janusia caudata proxima quoad reductus et species Janusiae hexandrae proxima quoad petala margine fimbriata et antheris pubescentis. Liana. Stipula triangularis. Laminae subtus glabrae, suprae sericeae, basi stipitato glanduloso. Corymbus 1 vel 2 rachis compositae, rachis terminalis coymbus compositae 4 florum. Structurae floralis diminutas. Stamina 6 leviter heteromorfae. Stigma diminutum. Nux lateralibus paris appendicibus instructae. Flores abnormes nullis.

Type: BRAZIL. RIO DE JANEIRO: Armação de Búzios, Estrada Búzios - Cabo Frio, Fazenda São Miguel, Rancho 10, Búzios Mega Resort Hotel (APA do Pau Brasil), 5-V-2004, fl., fr., R.D. Ribeiro & J.I. Costa-Silva 205 (holotypus RB, isotypus SP).

1. Programa de Pós-Graduação em Biodiversidade e Meio Ambiente, Instituto de Botânica

2. Universidade Federal de São Carlos, Centro de Ciências Agrárias, Caixa Postal 153, 13600-970 Araras, SP, Brasil

3. Instituto de Botânica, Núcleo de Pesquisa Curadoria do Herbário de São Paulo, Caixa Postal 68041, 04045-972 São Paulo, SP, Brasil

4. Corresponding author: sebastiani@cca.ufscar.br

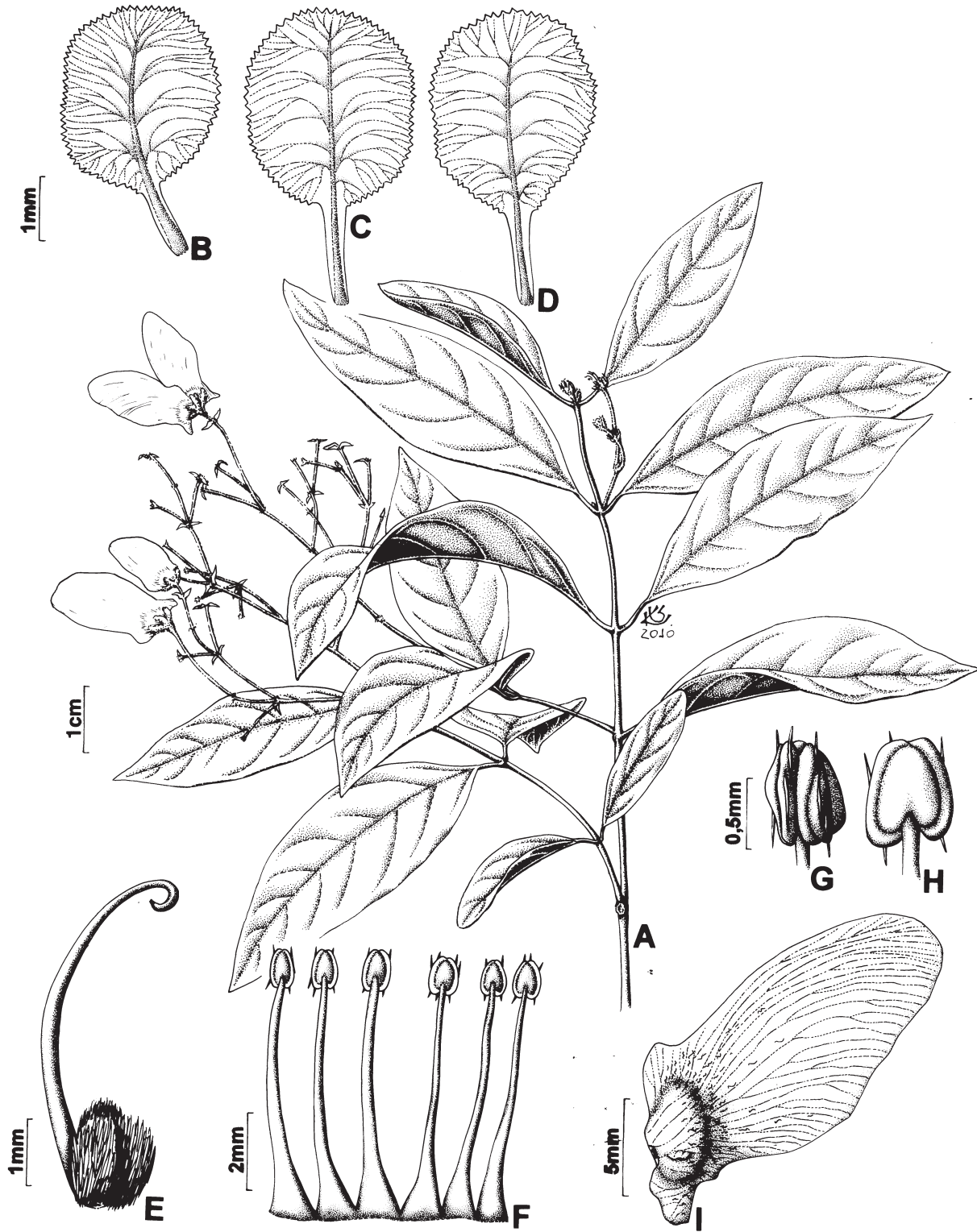


Figure 1. *Janusia diminuta* R. Sebast. & Mamede. A. Fruiting branch. B. Posterior petal. C. Latero-posterior petal. D. Latero-anterior petal. E. Gynoecium. F. Androecium, the three first stamens, from right to left embedded between the latero-anterior petals. G. Anther, frontal view. H. Anther, dorsal view. I. Samara. (Drawn from the holotype).

Vines, branches cylindrical, young branches sericeous to glabrescent, hairs bright brown, old branches glabrous, with lenticels; stipules ca. 1 mm long., glabrous, triangular. Leaves with sericeous petioles, hairs bright brown, 0.3-1 cm long.; blades membranous, elliptical, $2.7-6.5 \times 1.1-2.3$ cm, apex acute to acuminate, margin entire, base attenuate; adaxially glabrous, abaxially sparsely sericeous, hairs bright brown, midrib abaxially evident; one pair of stipitate glands at lamina base. Inflorescence in umbelliform corymbs, 4-flowered, rarely a panicle with three umbelliform corymbs; two or three branches, the first one sterile and the last one with one umbelliform corymb, sometimes with lateral flowers or buds, glabrescent, tomentose, hairs bright brown; umbelliform corymbs 3.2-6 cm long.; basal branch 0.3-0.9 cm long., intermediate branch 0.9-1.9 cm long., terminal rachis 0.5-1.6 cm long., inflorescence bracts ca. 3×1 mm, similar to the leaves, ovate with dark brown hairs; flower bract $2-3 \times$ ca. 1 mm, perpendicular to the peduncle, lanceolate, dark brown, glabrous on both sides, eglandular, margin not ciliate; bracteoles 2, ca. 3×1 mm, perpendicular to the pedicel, ovate, dark brown, glabrous, margin ciliate; peduncle 4-10 mm long., pedicel 2-7 mm long. Calyx 8-glandular, sepals $3.8-4 \times 1.5-1.6$ mm, elliptical, margin not ciliate, apex acute, adaxially glabrous, abaxially sericeous, hairs bright brown, the anterior eglandular, the lateral 4 biglandular; glands $1.6-1.9 \times 0.5-0.6$ mm, obovate. Petals deep yellow, margin slender fimbriate, eglandular, glabrous; posterior petal ca. 3.5×1.6 mm, claw ca. 1.2 mm long.; latero-posterior petals ca. 4.1×2 mm, claw ca. 1.5 mm long.; anterior petals ca. 4×2.6 mm, claw ca. 1.5 mm long. Stamens 6, in two whorls of three, stamens of anterior whorl slightly longer and thicker than those of posterior whorl, filaments 6.1-6.5 mm long., connate only at base; anthers ca. 0.8×0.5 mm, bearing sparse malpighiaceus hairs, connective ca. 0.7×0.5 mm, not exceeding the locules. Carpels $0.8-1.5 \times 0.5-1$ mm, rounded, densely sericeous, hairs bright brown; style 6.3-6.5 mm long., curved downward toward posterior petal, apex arched, stigma terminal, ca. 0.1 mm diam., touching the stamens of posterior whorl. Embryo $0.4-0.6 \times$ ca. 0.2 mm, anatropous. Cleistogamous flowers not seen. Fruits samaras sericeous, hairs bright brown, more abundant between the nut and the wing, sparse in the remaining; wing, ca. 15×9 mm, obovate, margin entire, nut ca. 5×3 mm, rounded, longitudinal ribs not very conspicuous; one pair of lateral wings on the nut, ca. 1 mm long.; carpophore between the nut and the wing, extending from receptacle, lanceolate, ca. 4×3 mm; areola ca. 1 mm diam.

Janusia diminuta is only known from the Restinga vegetation of Armação de Búzios, on the Northern coast of Rio de Janeiro State. Flowering and fruiting specimen was collected in May.

Janusia diminuta is characterized by the reduced dimensions of floral structures and the reduction of its inflorescence, which shows one or two sterile rachis above the corymb stalk and by its samara with one pair of lateral wings. Such features are shared with *J. anisandra* (A. Juss.) Griseb. and *J. caudata* (A. Juss.) Griseb. (table 1). Both species occur mainly in Caatinga vegetation, whereas *J. anisandra* occurs in the states of Ceará, Pernambuco, Alagoas, Paraíba, Bahia and Minas Gerais, *J. caudata* is common in the states of Pará, Maranhão and Piauí. *Janusia diminuta* is known only for the State of Rio de Janeiro.

The distribution of *Janusia diminuta* is related to *J. hexandra*, a species commonly found in the states of Rio de Janeiro, Espírito Santo and Bahia. Both species present sericeous hairs, fimbriate petals and anthers with sparse malpighiaceus hairs, but they differ in their inflorescence pattern, the size of their floral structures and the fruit morphology. While *J. diminuta* shows reduced floral structures and winged samara, *J. hexandra* has larger flowers and fruits lacking lateral wings, but presenting little extensions on the nut ribs. With regards to the floral dimensions, some structures are clearly smaller in *J. diminuta* than in *J. hexandra*, such as the sepal glands and the posterior petal (Sebastiani 2010). Another important feature to distinguish *J. diminuta* from *J. hexandra* is their habitat. *Janusia diminuta* was only found in Restinga vegetation and *J. hexandra* occurs within tropical forests (Matas hígrófilas sul-baianas in Bahia State and Matas de tabuleiro in Espírito Santo State) as well as on borders of secondary vegetation (in Rio de Janeiro State).

The only collection analyzed for *J. diminuta* came from a sustainable protected area (Área de Proteção Ambiental do Pau-Brasil). This reserve was visited a few times, but no specimens were found. Throughout these visits, intense anthropic action was observed, which may represent a major threat to the flora and fauna in such area.

2. *Janusia paraensis* R. Sebast. & Mamede sp. nov.

Figure 2

Species Janusiae janusioides proxima quoad petali margine fimbriata, antheris pubescentis et lateralibus paris appendicibus nullis. Liana. Stipula

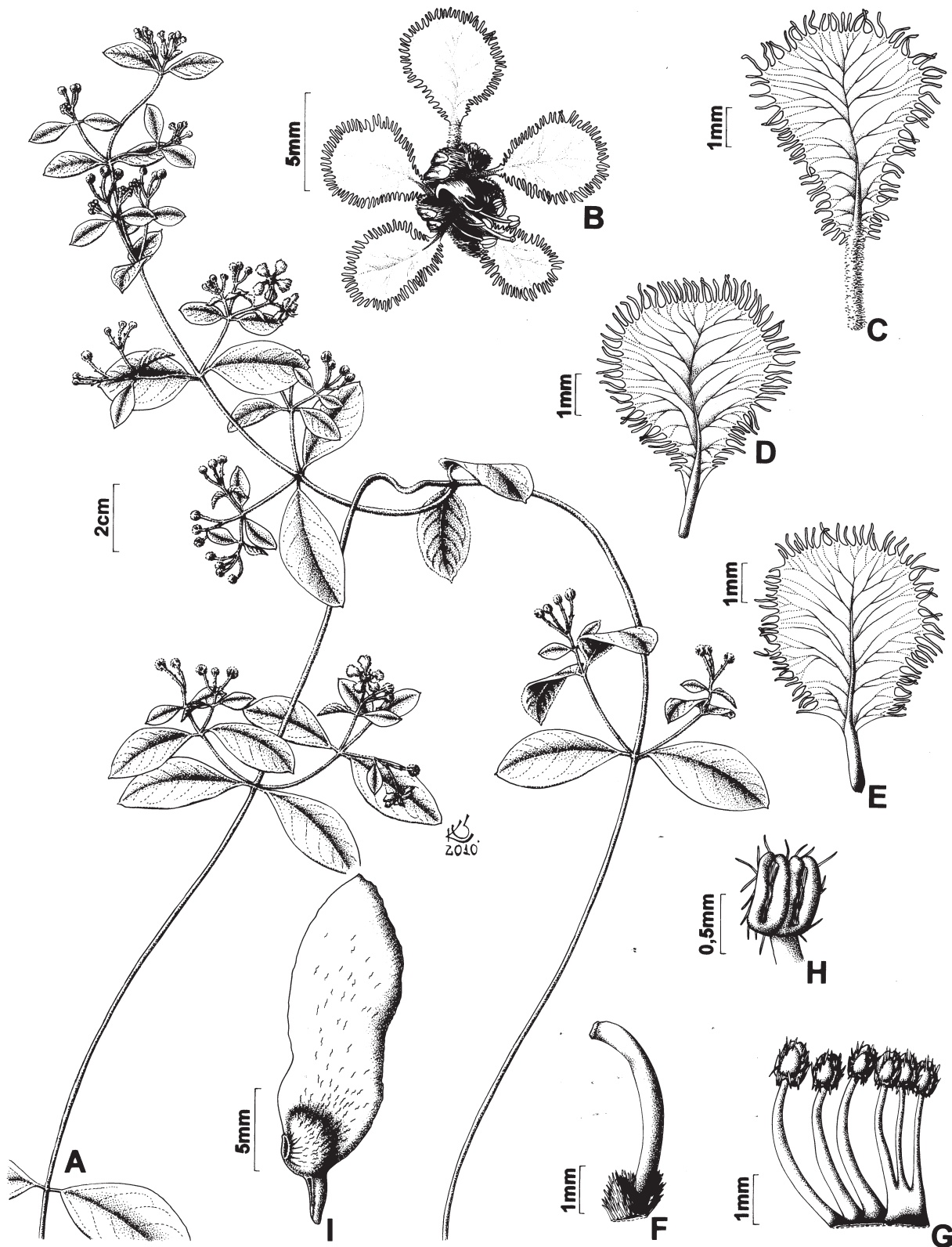


Figure 2. *Janusia paraensis* R. Sebast. & Mamede. A. Flowering branch. B. Flower. C. Posterior Petal. D. Latero-posterior petal. E. Latero-anterior petal. F. Gynoeceum. G. Androeceum, the three first stamens, from right to left, embedded between the latero-anterior petals. H. Anther, frontal view. I. Samara. (Drawn from the holotype).

nulla. Laminae subtus glabrae, suprae sericeae, medio et basi stipitato glanduloso. Corymbus solis. Petalum fimbriatum, petalum posterius ungue pubescente, appendicibus nullis. Stamina 3 antica longiora 3 postica. Flores abnormes nullis.

Type: BRAZIL. PARÁ: Tucuruí, Rio Tocantins, arredores da Vila de Breu Branco, 12-V-1978, fl., fr., *M.G. Silva & R. Bahia 3524* (holotypus MG, isotypus RB).

Vines, branches cylindrical, young branches sericeous, bright brown hairs, old branches glabrescent, with lenticels; stipules absent. Leaves with sparsely tomentose petioles, bright brown- to -white hairs, 0.3-0.6 cm long.; blades membranous, elliptical, 2.1-5.7 × 1.1-3.9 cm, apex mucronate, margin entire, base obtuse; adaxially glabrescent, abaxially sparsely tomentose, bright brown- to -white hairs, midrib abaxially conspicuous; one pair of stipitate glands in the middle of the petiole and one pair of stipitate glands at lamina base. Inflorescence in umbelliform corymbs, 4-flowered, one pair of bud subtended by bracts, 3-8 mm long., rarely with lateral corymbs; sericeous, bright brown hairs; umbelliform corymbs 2.2-2.8 cm long.; rachis 0.6-1.1 cm long., inflorescence bracts ca. 3 × 1 mm, similar to the leaves, covered by dark brown hairs; flower bract ca. 2 × 1 mm, appressed to peduncle, lanceolate, dark brown, adaxially glabrous, abaxially sericeous, bright brown, eglandular, margin ciliate; bracteoles 2, ca. 2 × 1 mm, appressed to pedicel, lanceolate, sericeous, bright brown, eglandular, margin ciliate; peduncle ca. 2 mm long, pedicel 10-11 mm long., enlarging during frutification. Calyx 8-glandular, sepals 3-4.5 × 1.6-2 mm, elliptical, margin ciliate, apex rounded, adaxially sericeous, hairs hialine, abaxially sericeous, bright brown hairs, the lateral 4-biglandular, the anterior eglandular; glands 1.9-2.4 × 0.5-0.9 mm, obovate. Petals deep yellow, margin deeply fimbriate, eglandular, glabrous; posterior petal ca. 6 × 5 mm, claw ca. 1 mm long., pubescent; latero-posterior petals ca. 5 × 4.5 mm, claw ca. 1 mm long; anterior petals ca. 5 × 4 mm, claw ca. 1.4 mm long. Stamens 6, in two whorls of three stamens each, stamens of anterior whorl slightly taller and thicker than stamens of posterior whorl, filaments 2.2-4 mm long, connate only at base; anthers 0.8-0.9 × 0.4-0.8 mm, bearing sparse malpighiaceus hairs, connective 0.3-0.8 × 0.3-0.4 mm, not exceeding the locules. Carpels 1-1.4 × 0.5-0.8 mm, rounded, densely sericeous, bright brown hairs; style 3-4.3 mm

long., curved downward towards posterior petal, apex arched, terminal stigma, ca. 0.3 mm diam., touching the stamens of posterior whorl. Embryo ca. 0.7 × 0.5 mm, anatropous. Cleistogamous flowers not seen. Fruits samaras, sericeous, bright brown hairs, more abundant between the nut and the wing, sparse in the remaining; wing ca. 18 × 8-9 mm, obovate, margin entire, nut 4-5 × 2-3 mm, rounded, inconspicuous longitudinal ridges; without lateral wings on the nut; carpophore extending from the nut, triangular, ca. 4 × 4 mm; areola ca. 2 mm diam.

Paratypes: BRAZIL. PARÁ: Conceição do Araguaia, 2-VI-1979, *E. Mileski 299* (CEPEC, RB); Monte Alegre, 26-III-1924, *J.G. Kuhlman 1765* (MG, RB); Santarém, IX-1849-III-1850, *R. Spruce s.n.* (K s.n., M0151688, P s.n., TCD0003936); Ca. 7 km SW of Santarém, on road to Alter do Chão, 12-III-1982, *W.R. Anderson 12517* (K, MBM, RB); Santarém, Alter do Chão, Ilha do Matarí, 25-V-1987, *L.C.B. Lobato & J. Oliveira 419* (MG); Tucuruí, Breu Branco, a 35 km de Tucuruí, 5-XI-1979, *M.F.F. Silva et al. 45* (HRB, MG, UFMT); Tucuruí, Breu Branco, 17-III-1980, *T. Plowman et al. 9667* (MG, NY); Boca do Tapajós, 10-VIII-1969, *M. Silva & R. Souza 2216* (MG); Margem direita do Rio Tocantins, 28-V-1980, *M.G. Silva & C.S. Rosário 5216* (MG); Km 25 south of Represa Tucuruí on road to Breu Branco, 16-III-1998, *T. Plowman et al. 9649* (F, MG, NY).

Janusia paraensis is only known in Pará State, in Amazonian savanna. Flowering specimens were collected from November to January and fruiting specimens from November to March.

Janusia paraensis is characterized by one pair of stipitate glands on the petiole and at lamina base; inflorescence in umbelliform corymbs, a pubescent claw, lacking appendices on posterior petal, and the connectives not exceeding anther locules.

Two species of the genus may also occur in Amazonian savanna: *Janusia prancei* W.R. Anderson (in Amazonas and Rondônia States) and *J. janusioides* (A. Juss.) W.R. Anderson (in Pará and Tocantins States, besides occurring in Cerrado areas of Maranhão, Piauí, Ceará, Goiás, Mato Grosso, Mato Grosso do Sul, and Minas Gerais States). While *Janusia janusioides* presents tomentose ferruginous to bright brown hairs and triangular stipules, *J. paraensis* has sericeous bright brown hairs and the stipules are absent (table 2). Another difference between these species is the posterior petals with one pair of deeply fimbriate

Table 1. Some features of *Jamusia diminuta* and related species.

	<i>J. diminuta</i>	<i>J. anisandra</i>	<i>J. caudata</i>	<i>J. hexandra</i>
Hairs	Sericeous bright brown	Tomtose bright brown	Sericeous bright brown	Sericeous silver to bright brown
Stipules	Triangular, not glandular	Triangular, not glandular	Rounded, not glandular	Rounded, glandular
Inflorescence type	UC ¹ 4-flowered, rarely panicle with 3 UC ¹	Panicle of UC ¹ 4-flowered	Panicle of UC ¹ 1-3- flowered	Panicle of UC ¹ 4-flowered
Sterile branches in the inflorescence	Present	Present	Present	Absent
Number of bracteoles	2	2	5	2
Petals	Glabrous, fimbriate	Glabrous, fimbriate	Glabrous, fimbriate	Glabrous, fimbriate
Posterior petal size ²	Smaller	Same size	Same size	Smaller
Morphology of stamens	Slightly heteromorphous	Deeply heteromorphous	Deeply heteromorphous	Deeply heteromorphous
Anthers hairs	Malpighiaceae	Malpighiaceae	Malpighiaceae	Malpighiaceae
Connective	Not exceeding the locules	Not exceeding the locules	Not exceeding the locules	Exceeding the locules
Lateral wings on the nut	Present	Present	Present	Absent

¹umbelliform corymbs; ²in comparison to other petals in the same flower.

Table 2. Some features of *Jamusia paraensis* and related species.

	<i>J. paraensis</i>	<i>J. janusoides</i>	<i>J. prancei</i>
Hairs	Sericeous bright brown	Tomtose ferrugineous to bright brown	Tomtose bright brown
Glands on the lamina	Stipitate	Stipitate	Orbicular
Stipules	Absent	Triangular	Triangular
Inflorescence type	UC ¹ 4-flowered	Panicle of UC ¹ 4-flowered	UC ¹ 4-flowered
Proportion peduncle/pedicel	Peduncle smaller than pedicel	Peduncle smaller than pedicel	Peduncle absent
Petals	Glabrous, fimbriate	Glabrous, fimbriate	Glabrous, fimbriate
Posterior petal size ²	Larger	Larger	Smaller
Characteristics of posterior petal	Without appendices, pubescent claw, not glandular	One pair of appendices, pubescent claw, glandular	Without appendices, not pubescent claw, not glandular
Anthers hairs	Malpighiaceae	Pubescent	Pubescent
Connective	Not exceeding the locules	Not exceeding the locules	Exceeding the locules
Carpophore	Winged, extending from the nut	Winged, extending from the nut	Not winged, adhered to the nut
Lateral wings on the nut	Absent	Absent	Absent

¹umbelliform corymbs; ²in comparison to others petals in the same flower.

appendices in *J. janusioides*, absent in *J. paraensis*. However, both have a short peduncle, yellow fimbriate petals, posterior petals with a pubescent claw, connective exceeding the locules, and nuts without lateral wings. *Janusia paraensis* differs from *J. prancei* by the absence of stipules, stipitate glands on the lamina, a pubescent claw, and a connective not exceeding the locules. On the other hand, *J. prancei* has triangular stipules, orbicular glands on the lamina, not pubescent claw, and connective exceeding the locules.

However, none of the collections of *J. paraensis* analyzed was obtained in protected area, which may contribute to species endangerment.

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