

## *Peregrina*, a New Genus of Malpighiaceae from Brazil and Paraguay

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**ABSTRACT.** *Peregrina* is proposed to accommodate the single species *Peregrina linearifolia*, which has been assigned to four related genera since its discovery. *Peregrina* is probably derived from *Janusia*, but its unique samara with equally well-developed dorsal and lateral wings, somewhat similar to that of *Gaudichaudia*, makes it necessary to segregate the species as a distinct genus.

In his "Malpighiacearum synopsis" (1840) Adrien de Jussieu recognized the group Gaudichaudieae, distinguished from other neotropical Malpighiaceae by their reduced androecium. He included the genera *Fimbriaria* St.-Hil. (a later homonym replaced in the 1843 monograph by *Schwannia* Endl.), *Janusia* Adr. Juss., *Gaudichaudia* H.B.K., *Aspicarpa* Rich., and *Camarea* St.-Hil. The next monographer of the family, Franz Niedenzu, did not maintain this grouping, assigning *Gaudichaudia* to a tribe different from that to which the other four genera were assigned (1928). This was one of several unfortunate effects of Niedenzu's practice of relying on single weighted characters. I agree with Jussieu that the Gaudichaudieae constitute a natural taxon. I retain in the Gaudichaudieae all the species of Jussieu, but have concluded that *Schwannia* must be combined with *Janusia* (Anderson 1982). The Gaudichaudieae were probably derived from *Banisteriopsis* Rob., sharing its terminal capitate stigma but differing in that the styles are usually reduced from three to one and the stamens from ten to six (one opposite the posterior petal plus five opposite the sepals) or fewer. In the process of revising all these genera, I have been unable to place one species satisfactorily in any described genus. A new genus is proposed here to accommodate that species, which is also provided a full description parallel to those that will be published for the other Gaudichaudieae in forthcoming publications.

***Peregrina*** W. Anderson, gen. nov. (fig. 1).—

TYPE: *Peregrina linearifolia* (St.-Hil.) W. Anderson.

Suffrutex ramulis herbaceis erectis non volubilibus; folium 2 glandulis disciformibus marginalibus prope basim instructum; flores

omnes chasmogami, in umbellis terminalibus (2-)4-6(-12)-floris portati; pedicellus sessilis; petala aurantiaca; stamina 5, sepalis opposita, omnia fertilia et inter se aequalia; staminodia nulla; antherae paucipiliferae vel glabrae; carpella 3, discreta; stylus plerumque 1, in carpello antico portatus, stigmatibus terminaliter complanato; fructus schizocarpicus, ex 3 samaris alis membranaceis compositus; samara alis dorsali et laterali aequaliter bene evolutis, e receptaculo carpophoro filiformi suspensa; chromosomatum numerus,  $n = 19$ .

This genus comprises only the following species:

***Peregrina linearifolia*** (St.-Hil.) W. Anderson, comb. nov. (fig. 1).—*Gaudichaudia linearifolia* St.-Hil., Bull. Sci. Soc. Philom. Paris 1823:132. 1823.—*Janusia linearifolia* (St.-Hil.) Adr. Juss., Ann. Sci. Nat. Bot. (Sér. 2) 13: 251. 1840.—*Camarea juncea* Griseb. in Mart., Fl. Bras. 12(1):105. 1858.—*Aspicarpa linearifolia* (St.-Hil.) Nied., Verz. Vorles. Königl. Akad. Braunsberg W.-S. 1912/13:56. 1912.—TYPE: Brazil, Paraná, Quartela [Faz. Guaratela], Campos Gerais [region of Castro and Piraí do Sul], Feb [1820], fl, St.-Hilaire (holotype Catal. C<sup>2</sup>, no. 1491: P!; photo: MICH!; isotype Catal. C<sup>2</sup>, no. 1490<sup>9</sup>: P!; photo: MICH!). For an explanation of the numbering of St.-Hilaire's collections, see Dwyer 1955.

Perennial with many stems from woody rootstock; stems slender, erect, non-twining, 15-45 cm tall, sericeous, eventually glabrescent. Leaves opposite or subopposite, distant, the larger laminas 15-45(-50) mm long, 1-6(-12) mm wide, linear or narrowly elliptical or ovate, tapered or cuneate at the base, often somewhat revolute at the margin, acute at the apex, thinly

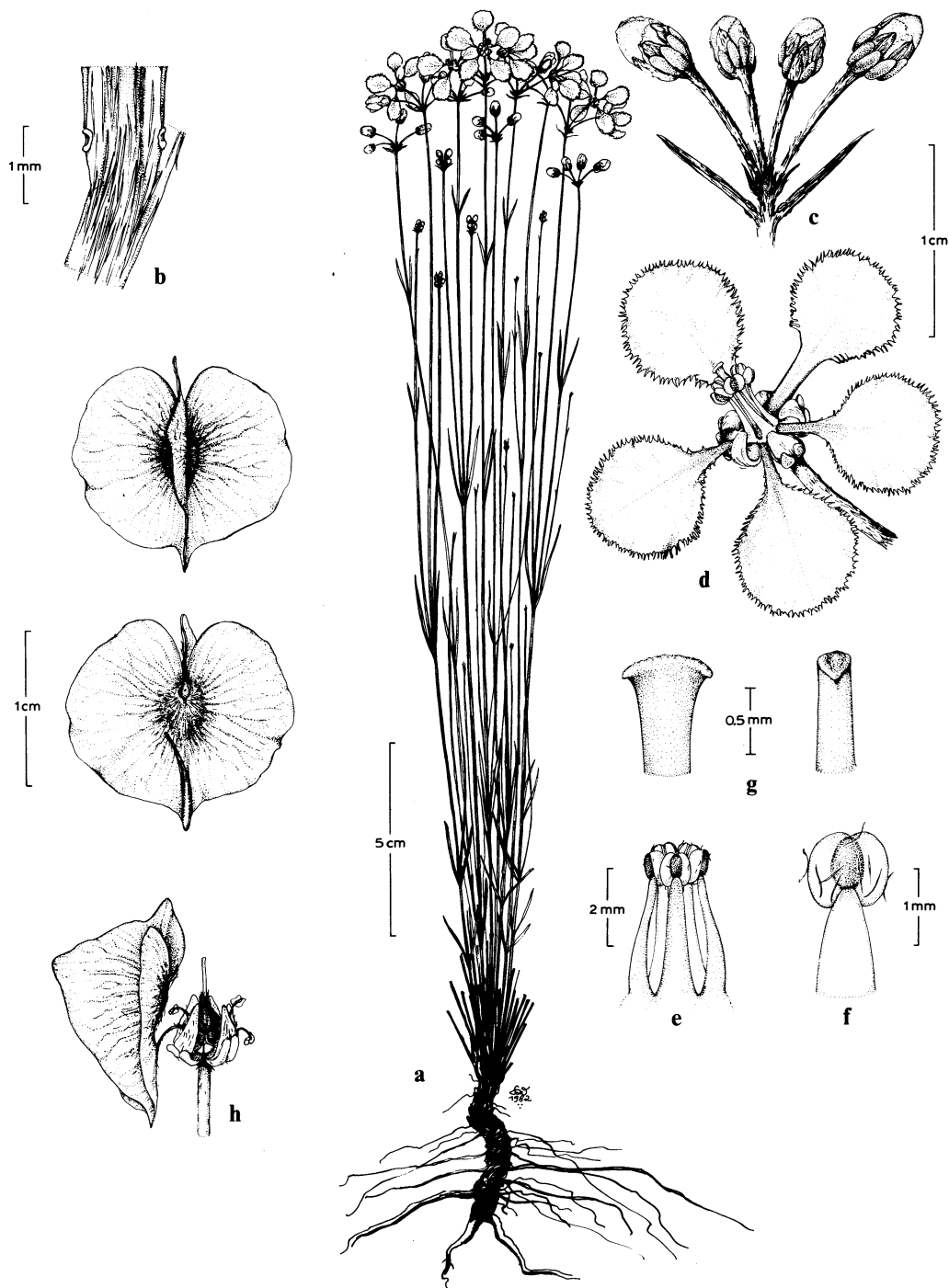


FIG. 1. *Peregrina linearifolia*. a. Habit. b. Base of leaf, showing marginal glands. c. Umbel of flower buds. d. Flower, the posterior petal at upper right. e. Androecium. f. Anther, abaxial view. g. Stigma, side view (left) and end view (right). h. Samara, abaxial view (top), adaxial view (middle), side view, still attached to receptacle by carpophore (bottom). (a-c from Hatschbach 22317, d-g from Anderson 11764, h from Jörgensen 4480.)

sericeous on both sides, sometimes glabrescent above, bearing 1 disc-shaped marginal gland on each side at the base; petiole 0.5–2 mm long, sericeous, hardly distinguishable from the tapered lamina in narrow leaves; stipules minute (0.1–0.2 mm long), borne on base of petiole, often hidden under hairs. Inflorescence a terminal umbel of (2–)4–6(–12) flowers, the flowers all chasmogamous, the umbel usually single but occasionally subtended by 1 or 2 secondary umbels to produce a dichasium; floriferous bracts and bracteoles 0.5–3 mm long, sericeous to nearly glabrous, eglandular or the largest bracts biglandular, persistent, the cluster often subtended by a single pair of sterile, much-reduced, biglandular leaves; peduncle usually none, very rarely up to 5 mm long; pedicel 3–11(–15) mm long, sericeous, straight in bud. Sepals 5, free, 3.5–4.3 mm long, 1.3–2 mm wide, narrowly elliptical or ovate, entire or erose, rounded at the apex, incurved in anthesis, abaxially sericeous in the center, adaxially glabrous, the anterior eglandular, the lateral 4 biglandular, the glands 1.5–2 mm long. Petals 5, orange-yellow, glabrous, flat, short-fimbriate; lateral 4 petals spreading, with the limb 6–7 mm long, 4–7 mm wide, elliptical or orbicular, the claw 1.7–2.5 mm long; posterior petal erect, similar to the laterals but with a smaller limb and longer thicker claw, the limb 4.5–5.5 mm long, 4–6 mm wide, the claw 3–5 mm long. Stamens 5, opposite the sepals; filaments 2.5–3 mm long, more or less alike, glabrous, free or connate at the base, flattened, erect and straight, pressed against the style in anthesis; anthers 0.9–1.3 mm long, all fertile, alike, sparsely pilose or glabrous. Carpels 3, free, ca. 1 mm high, densely hairy, all fertile; style usually 1, 3.2–3.8 mm long, straight, glabrous, borne on the anterior carpel, a second usually slenderer style occasionally borne on one of the posterior carpels; stigma terminal, capitate, laterally flattened, exceeding the anthers in anthesis. Fruit breaking apart into 3 samaras borne on a short pyramidal torus; samara thinly sericeous to glabrate, with straight sessile appressed medifixed hairs, the membrane lateral and dorsal wings equally well developed; lateral wing 14 mm high, 7 mm wide on each side of the nut, roughly circular, incised to the nut at the apex, continuous and slightly extended at the base, entire or undulate at the margin, bearing on the abaxial lower half a filiform carpophore by which the samara is suspended from the recep-

tacle; dorsal wing roughly triangular, 14 mm high, 7–8 mm wide, at the apex inserted through the cleft in the lateral wing, at the base fused with the lateral wing, the margin entire or undulate; nut ca. 4 mm high, 3 mm wide, the ventral areole circular, ca. 1 mm in diameter; embryo with the cotyledons equal, flat, folded upward near their middle. Chromosome number,  $n = 19$ , counted in *Anderson 11764*.

*Distribution.* Grassy sandy campos of Paraná, Brazil, and Paraguay, at 800–900 m, flowering Aug–Mar. O'Donnell and Lourteig (1943) cited a specimen from Misiones, Argentina. I have seen no specimens from Argentina and have not had an opportunity to verify their identification of the specimen cited. St.-Hilaire stated in the *Plantes Remarquables* (1825) that the type was collected in São Paulo, but it is clear from Urban's itinerary for St.-Hilaire (1906) that he was in Paraná, following the road from São Paulo to Curitiba. He crossed the Rio Itararé to enter the present state of Paraná just before the end of January 1820, and stayed at the Fazenda Guartela sometime after 9 February, before continuing south to Castro.

*Representative specimens examined.* BRAZIL. **Paraná:** Mun. Campo Mourão, Campo Mourão, *Hatschbach 13011* (US); Mun. Tibagi, Fda. Ingrata, *Hatschbach 5479* (US); Mun. Ponta Grossa, Vila Velha, *Anderson 11764* (MBM, MICH), *Dusén 9113* (F, G, S), Desvio Ribas, Turma, *Dusén 15657* (F, GH, MO, NY, S, US), Rio Guaivirova, *Hatschbach 22317* (MICH, P, US), Fda. Cambiju, *Hatschbach 32952* (C, MO, NY), Vila Velha, *Hatschbach 10239* (U), 45479 (MICH), *Hoehne [SP 23350]* (GH, NY, SP); Mun. Pinhão, [Rio] Capão Grande, *Dusén 2778* (R, S).

PARAGUAY. **Depto. Amambay:** near Bela Vista, *Hassler 8275* (G, GH, NY, P, W). **Depto. San Pedro:** vic. San Estanislao, *Hassler 4117* (G, NY); near Río Carimbatay, *Hassler 4581* (F, G, GH, P, NY, W). **Depto. Canendiyú:** Nandurucay, Sierra de Maracajú, *Hassler 4930* (G, NY, P, W). **Depto. Caaguazú:** between Yhú and San Blas, *Fernández Casas 3859* (MO); near Caaguazú, *Hassler 9118* (G). **Depto. unknown:** Tapytú, *Jørgensen 4480* (C, DS, F, GH, MO, NY, S, SP, US).

As the synonymy shows, this species has been assigned to all four genera of the Gaudichaudieae over the last 160 years. The generic name proposed here, which means a wandering alien, refers to the species' failure to find a stable home.

*Camarea* and *Aspicarpa* can be eliminated rather easily as appropriate genera for this species. Both are non-twining subshrubs like *Peregrina*, but that habit is common among

plants adapted to grassy campos, and it may have originated independently in all three groups. *Camarea* has six stamens, with the anterior-lateral pair of anthers replaced by elaborate staminodes. Its fruit is an unwinged nutlet without a carpophore, and the chromosome number of the species I have counted is  $n = 17$ . The androecium and chromosome number are really the only bases for separating *Camarea* from *Aspicarpa*, and *Peregrina* disagrees with *Camarea* in both respects. *Aspicarpa* is not a much better candidate for the closest relative to *Peregrina*. They have a similar androecium, but the fruit in *Aspicarpa* is an unwinged nutlet without a carpophore. Niedenzu saw only very immature fruits of *Peregrina*; I am sure he never would have placed it in *Aspicarpa* if he had seen the mature samara. The pedicels are pedunculate in *Aspicarpa*, and the stigma is terete. The species I have counted have chromosome numbers of  $n = 20$  or  $40$ .

*Gaudichaudia* and *Janusia* both have samaras with membranous wings and a filiform carpophore. *Gaudichaudia* is distinguished from *Janusia* by its samara, which has a dominant lateral wing and the dorsal wing reduced to a crest or lost altogether. The samara of *Peregrina* therefore resembles that of some species of *Gaudichaudia*, if we ignore the large triangular dorsal wing in *Peregrina*. However, other characters argue against placing *Peregrina* in *Gaudichaudia*. *Gaudichaudia* lacks glands on its leaves, its pedicels are always pedunculate, its anthers are glabrous, and its stigma is terete. The base chromosome number in *Gaudichaudia* is  $n = 40$ . *Gaudichaudia* diversified in Mexico, and the only species in South America now is a morphologically advanced one that has penetrated as far south as Colombia and Venezuela.

*Janusia* is the genus closest in all respects to *Banisteriopsis*, which I consider ancestral to the *Gaudichaudieae*. In *Janusia* the samara has an elongated dominant dorsal wing, while the lateral wing is at most a narrow crest, or absent. All species of *Janusia* are twining vines, and its stigma is terete. In several other respects it resembles *Peregrina*. Marginal glands are found on the leaves of some species; the pedicel is sessile in some species, although not the ones most like *Peregrina* in other characters; the anthers are pilose in some species; the base chromosome number is  $n = 10$ , but I have also

counted species with  $n = 19$ ,  $20$ , and  $40$ . Most species are native to central and southern South America.

*Gaudichaudia* was probably derived from an ancestor that had a samara similar to that of *Peregrina*, in which the lateral crest of a *Janusia*-type samara enlarged greatly and the dorsal wing was reduced. Those radically different samaras are the only solid morphological basis for maintaining *Gaudichaudia* distinct from *Janusia*. If we place *Peregrina* in *Gaudichaudia* on the basis of its samara, we maintain that distinction fairly well, but the other evidence convinces me that *Peregrina* is actually more closely related to *Janusia* than to *Gaudichaudia*, and may well have evolved its samara quite independently. If we place *Peregrina* in *Janusia*, we sacrifice the best generic character for *Janusia* and make its maintenance as a genus distinct from *Gaudichaudia* impracticable. While they are obviously closely related, *Gaudichaudia* and *Janusia* seem to represent independent phyletic branches. Both practical taxonomy and our understanding of the evolution of these plants are best served by maintaining them as separate genera. My solution to this dilemma is to segregate *Peregrina* as a distinct genus.

*Peregrina* probably originated in the complex of *Janusia* that includes *J. guaranitica* (St.-Hil.) Adr. Juss. and *J. schwanniioides* W. Anderson. Its ancestor would have been a slender vine with both chasmogamous and cleistogamous flowers, probably with five stamens and perhaps 19 pairs of chromosomes as in *J. guaranitica*. The following changes in such an ancestor would produce *Peregrina*: 1) shift in habit from a vine to an erect perennial herb; 2) radical restructuring of the samara, as described above; 3) loss of the cleistogamous flowers; 4) loss of the peduncle; and 5) lateral flattening of the stigma.

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