

Notes on *Ipomoea* (Convolvulaceae) from the Amazonian periphery

J. R. I. Wood^{1,2} & R. W. Scotland¹

Summary. Attention is drawn to the relatively low number of *Ipomoea* species found in the Amazon basin as well as to the rarity of most species restricted to the region. Six new species from the Amazonian periphery are described: *Ipomoea acrensis* J. R. I. Wood & Scotland and *I. altoamazonica* J. R. I. Wood & Scotland from Brazil and Peru, *I. maranyonensis* J. R. I. Wood & Scotland from Peru, *I. macarenaensis* J. R. I. Wood & Scotland from Colombia, *I. pogonocalyx* J. R. I. Wood & Scotland from Brazil and *I. deminuta* J. R. I. Wood & Scotland from Bolivia. Variation in *I. megapotamica* is discussed and two subspecies are recognised, subsp. *megapotamica* from southern South America and subsp. *velutina* J. R. I. Wood & Scotland from northern Brazil and Venezuela. Plants treated as *I. chenopodiifolia* M. Martens & Galeotti from Venezuela are recognised as *I. retropilosa* (Pittier) D. F. Austin. Two subspecies of this species are proposed, subsp. *retropilosa* being endemic to the Venezuelan Andes whereas the newly described subsp. *cundinamarca* J. R. I. Wood & Scotland is restricted to Colombia. *I. austinii* Infante-Bet. is treated as a synonym of the African *I. involucrata* P. Beauv., one of a number of Old World species now established in the neotropics.

Key Words. Amazon, Bolivia, Brazil, Colombia, introductions, Peru, rainforest, taxonomy, variation, Venezuela.

Introduction

Ipomoea is widely distributed in tropical and subtropical America and is often a conspicuous feature of roadsides, scrub, forest margins, swamp and savanna. However, our studies show that it is less diverse in the Amazonian rain forest than might be expected. There are a few widely distributed rainforest species which occur. Some of these are relatively frequent, such as *I. batatoides* Choisy and *I. philomega* (Vell.) House, and a few others are quite widespread but uncommon such as *I. amazonica* (D. F. Austin & Staples) J. R. I. Wood & Scotland (Map 1) or *I. eriocalyx* (Kuntze) (Mart. ex Choisy) Meisn. However, most species of *Ipomoea* recorded from moist forest are either widespread weedy species of disturbed areas or very localised species endemic to the Amazon basin often being known from a very few specimens from one or two locations. Amongst the few species hitherto known from this latter category are *I. spruceana* Meisn. and *I. marabaensis* D. F. Austin, to which this paper adds another six, all of which demonstrate a very restricted distribution around the periphery of the Amazon basin.

Materials and Methods

This publication is one of the fruits of ongoing monographic studies being carried out into the genus *Ipomoea* at the Department of Plant Sciences, University

of Oxford. These particular results are based mainly on the examination of material from a range of different herbaria visited by the first author during 2013–15 when unidentified material was picked out for further study. Most of this was subsequently sent on loan to Oxford through the collaboration of curators in the different institutions listed in the acknowledgements. We have also made extensive use of a range of images now available on line from different herbaria, especially C, COL, G, M, P, RB, SI and VEN, in many cases directly from the virtual herbaria of the individual herbaria but also through the extensive range of type material available through Jstor (www.jstor.org/). Although most of the specimens cited here are relatively old and have proved unsuitable for molecular sequencing, we have been able to suggest relationships with a degree of confidence based on our molecular studies (Muñoz *et al.* in prep.) and the obvious morphological characters. Species delimitation has inevitably been based almost entirely on the morphological characteristics of the specimens we have seen.

Ipomoea amazonica

Ipomoea amazonica (D. F. Austin & Staples) J. R. I. Wood & Scotland (Wood *et al.* 2015: 27).

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Turbina amazonica D. F. Austin & Staples (Austin & Staples 1991: 270). Type: Brazil, Amapá. D. F. Austin, C. E. Nauman, B. Rabelo, C. Rosario & M. R. Santos 7389 (holotype. MG; isotypes FAU, now at FTG!, NY!, US!).

Calystegia glaziovii Dammer (Dammer 1897: 41), non *Ipomoea glaziovii* Dammer (1897), **synon. nov.** Type: Brazil, Minas Gerais, “près de Queluz, dans la forêt,” *Glaziou* 13009 (holotype B†, photo F, isotypes K00612827, P03562329).

NOTE. This species is the most widespread of those endemic to the Amazon basin (Map 1), being found both to the north and to the south of the Amazon basin and in Bolivia and Colombia as well as Brazil. Its distribution strongly suggests that it has been widely overlooked and it could be expected to occur in Peru and Venezuela and possibly also in Ecuador, Guyana and Guyane Française. It illustrates well the patchy knowledge we have of the distribution of most Amazonian species.

The Minas Gerais locality cited for *Glaziou* 13009 appears improbable but not impossible.

Six localised new species

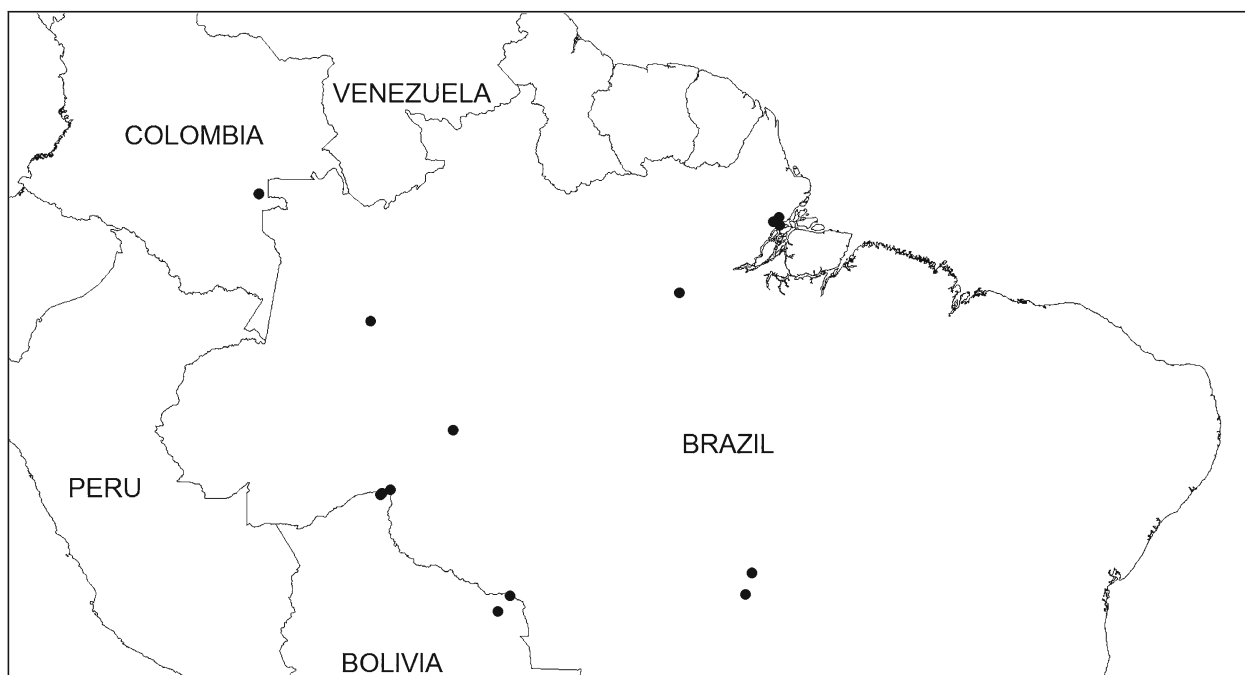
Ipomoea acrensis J. R. I. Wood & Scotland, **sp. nov.** Type: Brazil, Acre, Mun. de Río Branco, Apa do Ireneu Derra, 9°56'03"S 67°52'08"W, 12 July 2007,

C. S. Pessoa, E. Consuelo, I. E. S. Moll, P. Palhares, Adriana F. Obermüller, M. Silveira, I. M. Saar & W. Castro 302 (holotype RB).

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Twining *perennial*, “*liana*” (fide Pessoa *et al.* 302) of unknown height; stems glabrous, somewhat woody. *Leaves* petiolate, 6–16 × 5–12 cm, ovate, shortly acuminate to a fine point, cordate, the auricles rounded or acute, margin undulate, often irregularly dentate, glabrous, paler beneath, thin in texture, main veins abaxially prominent; petioles 9.5–11 cm, glabrous. *Inflorescence* of up to 7-flowered, axillary, pedunculate compound cymes, glabrous; peduncles 12–15 cm, stout, woody; bracteoles not seen, caducous; secondary and tertiary peduncles c. 2.5 cm; pedicels 2.3–6.5 cm, conspicuously thickened upwards; sepals slightly unequal, outer 18–22 × 10–12 mm, narrowly oblong-elliptic, acute or obtuse, mucronate, inner sepals very slightly shorter, pale green; corolla c. 10–11 cm long, glabrous, pale blue, narrowly funnel-shaped, the tube c. 2 cm wide for 5–7 cm, then widened to c. 3 cm; limb 5–6 cm diam., apparently lobed. *Capsule* and *seeds* not seen. Fig. 1.

RECOGNITION. This species is obviously close to *Ipomoea clavata* (G. Don) Oostst. ex J. F. Macbr. and appears to be similar in habit, corolla shape and corolla colour although we have seen no photographs of living plants. However, it differs significantly in being



Map 1. Distribution of *Ipomoea amazonica* (●). A widely distributed Amazonian species which illustrates the patchy nature of Amazonian records.

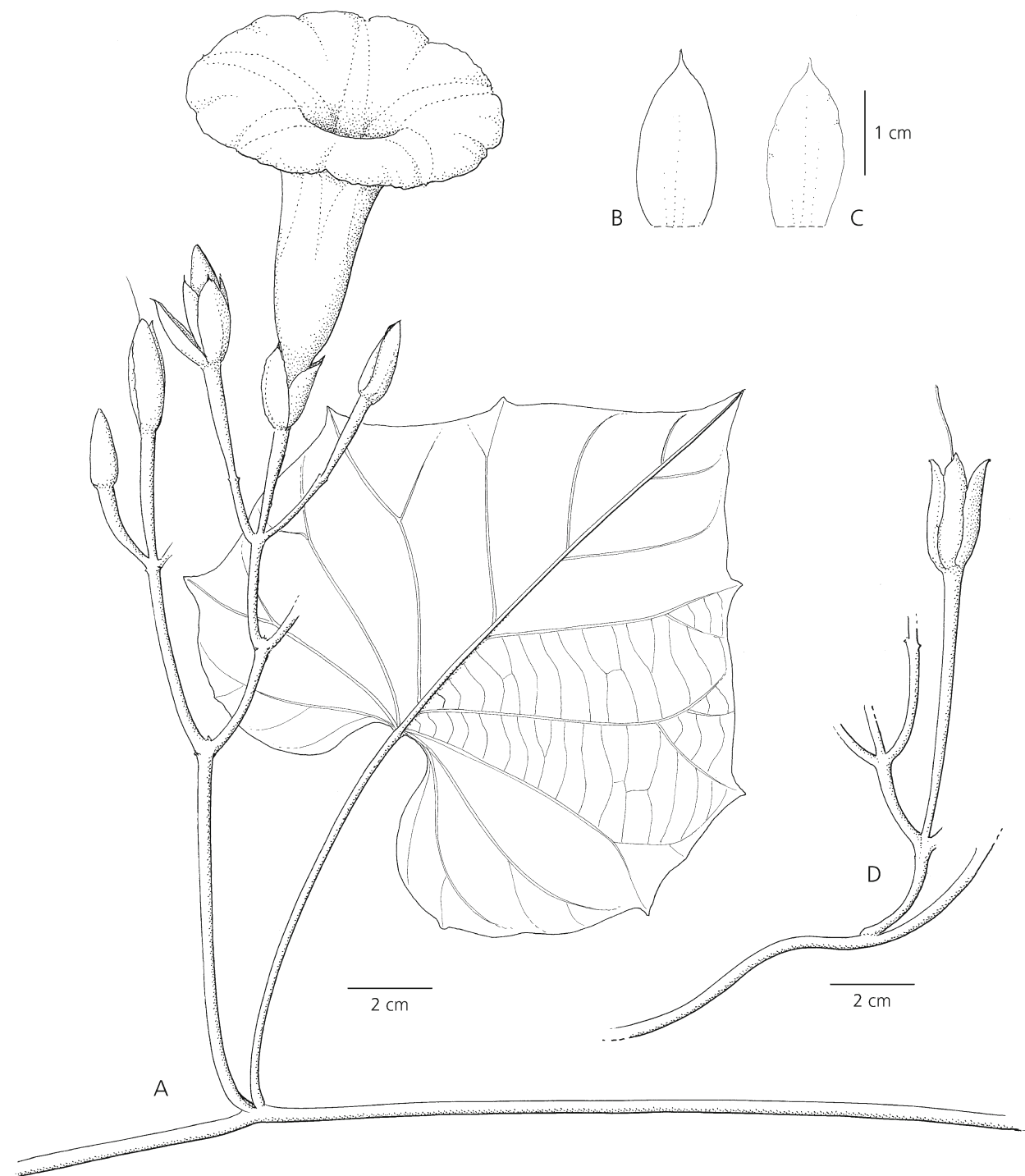


Fig. 1. *Ipomoea acrensis*. A habit; B outer sepal; C inner sepal; D fruiting calyx. A from Pessoa *et al.* 302, B – C from M. Alexiades & A. Byrne 865, D from A. Gentry *et al.* 37636. DRAWN BY ROSEMARY WISE.

entirely glabrous and lacks the long, white spreading hairs so characteristic of the stems of *I. clavata*. The inflorescence is long pedunculate, the peduncles up to 15 cm in length, whereas in *I. clavata* they are only 2.5 cm long. Additionally the cymes are up to 7-flowered whereas in *I. clavata* the flowers are usually solitary, rarely up to 3 together.

HABITAT & DISTRIBUTION. Upper Amazon region in Brazil and Peru (Map 2). Although not clearly specified by collectors, it is apparently a plant of disturbed areas derived from moist lowland rain forest.

SPECIMENS EXAMINED. BRAZIL. Acre: Mun. de Rio Branco, Apa do Ireneu Serra 9°56'03"S 67°52'08"W, 12 July 2007, C. S. Pessoa *et al.* 302 (holotype RB). PERU.

Huanuco: 69 km NE of Tingo Maria in disturbed roadside forest on road to Tocache, Huallaga valley, 9°00'S 76°W, 550 m, 16 July 1982, A. Gentry *et al.* 37636 (FTG, MO).

Madre de Dios: Tambopata, in well-lit bamboo forest in very moist subtropical forest, confluence of rivers Tambopata and Chuncho, 13°20'S 69°60'W, 400 m, 22 July 1989, M. Alexiades & A. Byrne 865 (NY).

CONSERVATION STATUS. Based on its area of occupancy of approximately 12,000 km², it could be categorised as Endangered (EN), but with only three records and an area of occurrence of almost 190,000 km², it should be treated provisionally as Data Deficient (DD). The existence of only three widely separated records gives little indication of its true frequency (Map 2).

ETYMOLOGY. This species is named after Acre State, from where the type was collected, itself named after the Río Acre a tributary of the Amazon.

***Ipomoea altoamazonica* J. R. I. Wood & Scotland, sp. nov.** Type: Peru, Cusco, Paucartambo, Chontachaka a Pillahuata, 700 m, P. Nuñez 8087 (holotype MO).

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Twining perennial *herb* 1 – 2 m high, growing over shrubs; stems pilose. *Leaves* petiolate, 7 – 11 × 7 – 9.5 cm, 3-lobed to half way or slightly less, base cordate with rounded auricles, lobes ovate, apex shortly acuminate and mucronate, both surfaces densely pubescent with long, somewhat asperous hairs; petioles 4 – 12 cm, pilose.

Inflorescence of up to 5-flowered axillary cymes; peduncles 1.3 – 5.3 cm, pilose; bracteoles 3 – 11 × 0.5 – 1 mm, filiform to linear, pilose; secondary peduncles (if present) 8 – 10 mm; pedicels 22 – 33 mm, pilose; sepals unequal, outer 14 – 17 × 5 – 6 mm, oblong-ovate, obtuse, mucronate, abaxially covered in scattered long white hairs mixed with soft spines, both 3 – 4 mm long, inner sepals 10 – 12 × 4 – 5 mm, ovate, mucronate, glabrous and spineless, margins scarious; corolla 5 cm long, funnel-shaped, white, glabrous; limb c. 4 cm diam. *Capsule* and *seeds* not seen. Fig. 2.

RECOGNITION. This species clearly forms a group of three species with *Ipomoea echinocalyx* Meisn. and *I. crincalyx* S. Moore. The group is easily recognised by the fleshy spines that cover most of the surface of the outer sepals but which are absent from other vegetative parts. All three are clearly closely related but occupy different geographical areas, *I. altoamazonica* being the only species found in Peru and adjacent parts of Amazonian Brazil. It is immediately distinguished from the other two species by the 3-lobed leaves (entire in the other two species). From *I. echinocalyx* it is also distinguished by the relatively long peduncles (up to 5.3 cm, not < 0.5 cm), which bear up to 5 flowers, rather than a single or (rarely) 2 – 3 flowers. From *I. crincalyx* it is distinguished by the white (not pink) flowers and the pilose indumentum of the stem, leaves, peduncles and sepals. *I. crincalyx* is glabrous or puberulent.



Map 2. Distribution of six new species from the periphery of the Amazon basin: *Ipomoea acensis* (●), *I. altoamazonica* (▲), *I. maranyonensis* (▼), *I. macarenensis* (*), *I. pogonocalyx* (◆), *I. deminuta* (■).

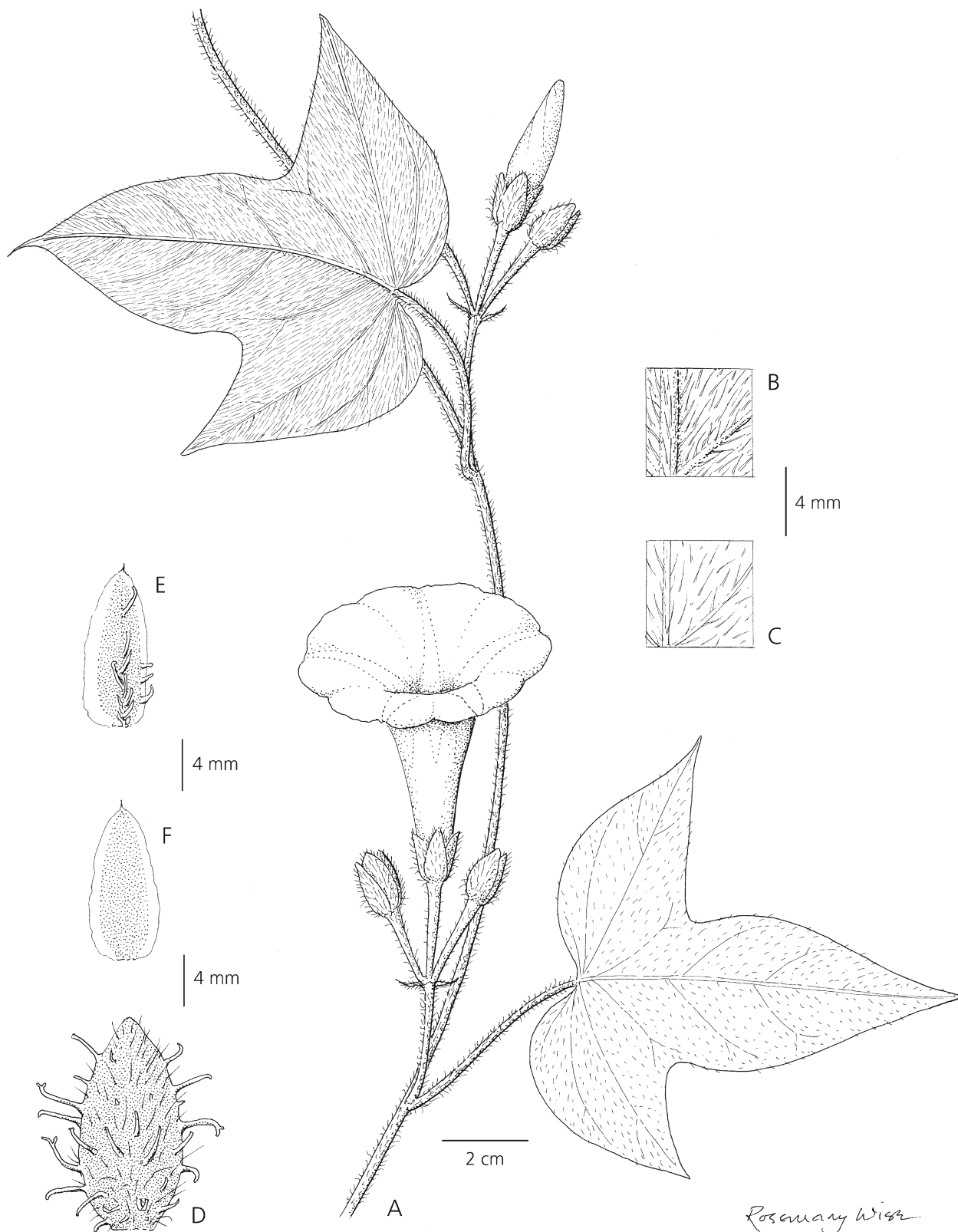


Fig. 2. *Ipomoea altoamazonica*. A habit; B adaxial leaf surface; C abaxial leaf surface; D outer sepal; E middle sepal; F inner sepal. A from D. C. Daly et al. 10707; B – C from D. C. Daly et al. 15012; D – F from Percy Nuñez 887. DRAWN BY ROSEMARY WISE.

HABITAT & DISTRIBUTION. A plant of lowland forest areas endemic to the upper Amazon watershed on the borders of Peru and

Brazil, found in secondary forest with abundant light (*Shunke & Graham* 15012) and in cloud forest (*Nuñez* 8087) (Map 2).

SPECIMENS EXAMINED. BRAZIL. Acre: Marechal Thaumaturgo, basin of Rio Jurúa, Rio Tejo, left bank, 8°59'30S 72°41'28W, 28 April 2001, *D. C. Daly et al.* 10707 (ARIZ). **PERU. Cusco:** Prov. Paucartambo, Chontachaca a Pillahuata, 700 m, 10 May 1987, *P. Nuñez* 8087 (holotype MO). **Ucayali:** Prov. Purús, 8 km debajo del Puerto Esperanza, margen derecho del Río Purús, 150 – 190 m, 10°12'S 70°57'W, 12 March 2002, *J. Schunke V. & J. G. Graham* 15012 (ARIZ).

CONSERVATION STATUS. Based on its area of occupancy of approximately 12,000 km², it could be categorised as Endangered (EN), but with only three records and an area of occurrence of over 32,000 km², it should be treated provisionally as Data Deficient (DD). The existence of only three widely separated records gives little indication of its true frequency (Map 2).

***Ipomoea maranyonensis* J. R. I. Wood & Scotland, sp. nov.** Type: Peru, Amazonas, Prov. Bagua, Imaza Distr., Com. Yamayakat, *R. Vásquez, A. Peña & E. Chávez* 23929 (holotype FTG; isotype MO).

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Liana of unknown height, apparently glabrous in all parts. *Leaves* petiolate, 5.5 – 10 × 7 – 8 cm, 3 – 5-lobed to near the base, the 4th and 5th lobes often only partially developed, lobes oblong-elliptic or lanceolate, 0.5 – 2.5 cm wide, acuminate, base truncate, abaxially paler; petioles 4 – 6 cm. *Inflorescence* of compounded axillary cymes, 20 – 30 cm long; peduncles 9 – 12 cm long; 2nd – 6th degree peduncles 1 – 4 cm; bracteoles 1 mm, oblong, scale-like, deciduous; pedicels 7 – 11 mm; sepals subequal, 5 – 7 × 2.5 – 4 mm, elliptic, coriaceous, concave, outer rounded, minutely mucronate, inner ±scarious, rounded; corolla 4 cm long, pink, funnel-shaped, glabrous; limb c. 2.5 cm diam., the midpetaline bands ending in teeth; stamens included, longer filaments c. 15 mm, shorter c. 8 mm, anthers oblong, 3 mm long; style 2.3 cm, glabrous; stigma biglobose. *Capsule* 6 × 4 mm, ovoid with a slender persistent style, glabrous; *seeds* (possibly immature) 3 × 1.5 mm, pilose with long white hairs on the angles. Fig. 3.

RECOGNITION. This species belongs to the distinctive clade with coriaceous, somewhat concave sepals of which *Ipomoea mauritiana* Jacq. is the best-known and most widespread species. It has indeed been identified as *I. mauritiana* but is immediately distinguished by the compound axillary inflorescences which reach 30 cm in length and are divided up to six times. Additionally, the sepals, corolla and capsules are all much smaller than in *I. mauritiana*. In *I. maranyonensis* the sepals are 5 – 7 × 2.5 – 4 mm, the corolla c. 4 cm long and the capsule only c. 6 × 4 mm whereas in *I. mauritiana* the

sepals are 7 – 10 × 5 – 6 mm, the corolla 5 – 6 cm long and the capsule 10 – 15 × 6 – 10 mm.

HABITAT & DISTRIBUTION. Endemic to “transitional primary forest” in the Marañón Valley of northern Peru (Map 2).

SPECIMENS EXAMINED. PERU. Amazonas: Prov. Bagua; Distr. Imaza, Com. Yamayakat, 5°03'24"S 78°20'17"W, 600 m, 6 June 1997, *R. Vásquez et al.* 23929 (holotype FTG; isotype MO); *ibid.*, 4°55'S 78°19'W, 320 m, 24 Nov. 1993, *R. Vasquez et al.* 18569 (FTG, MO).

CONSERVATION STATUS. Based on its very restricted area of occupancy and extent of occurrence this species would be assessed as Critically Endangered (CR). However, in the absence of any detailed understanding of its ecology or of its frequency in the two known populations, any formal categorisation would be premature and it should be categorised as Data Deficient (DD) until detailed studies can be carried out.

ETYMOLOGY. This species is named after the Rio Marañón in northern Peru, which forms a deep dry valley rich in endemic species before disgoring into the Amazon basin.

***Ipomoea macarenaensis* J. R. I. Wood & Scotland, sp. nov.** Type: Colombia, Meta, El Mico airstrip, last savannah before Río Guajar, 6 Nov. 1949, *W. R. Philipson, J. M. Idrobo & A. Fernández* 1322 (holotype BM; isotypes MO, US).

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Climbing perennial *herb* of unknown height; stems densely pubescent to subtomentose. *Leaves* petiolate, 2.5 – 5.5 × 2.8 – 5 cm, ovate, entire or very shallowly 2 – 3-lobed, apex acute, mucronate, base truncate to shallowly cordate, adaxially green, thinly adpressed-pilose, abaxially densely silvery-tomentose with rather long appressed hairs; petioles 2 – 3.8 cm, pubescent. *Inflorescence* of few-flowered axillary cymes; peduncles 1.2 – 5 cm; bracteoles 12 – 20 × 1 – 7 mm, linear to oblanceolate-narrowly elliptic, foliose, variable in size and shape; secondary peduncles 6 mm; pedicels 5 – 6 mm, pubescent; sepals subequal, densely pilose with long spreading hairs, outer 11 – 14 × 7 – 8 mm, ovate, acuminate, inner similar but the margins scarious, glabrous; corolla 5.5 – 6 cm long, funnel-shaped, white with pale pink centre, pubescent, limb c. 4 cm diam., entire, longer filaments c. 25 mm, shorter 12 – 14 mm; style 15 mm long, glabrous, stigma biglobose. *Capsule* and *seeds* not seen. Fig. 4.

RECOGNITION. This species clearly belongs to the radiation of species whose centre of diversity lies in eastern Paraguay. Like others in the clade the corolla and sepals are hirsute. At COL this species has been named *Ipomoea tuxtzensis* House (= *I. peteri* (Kuntze) Staples & Govaerts) but differs in a range of characters

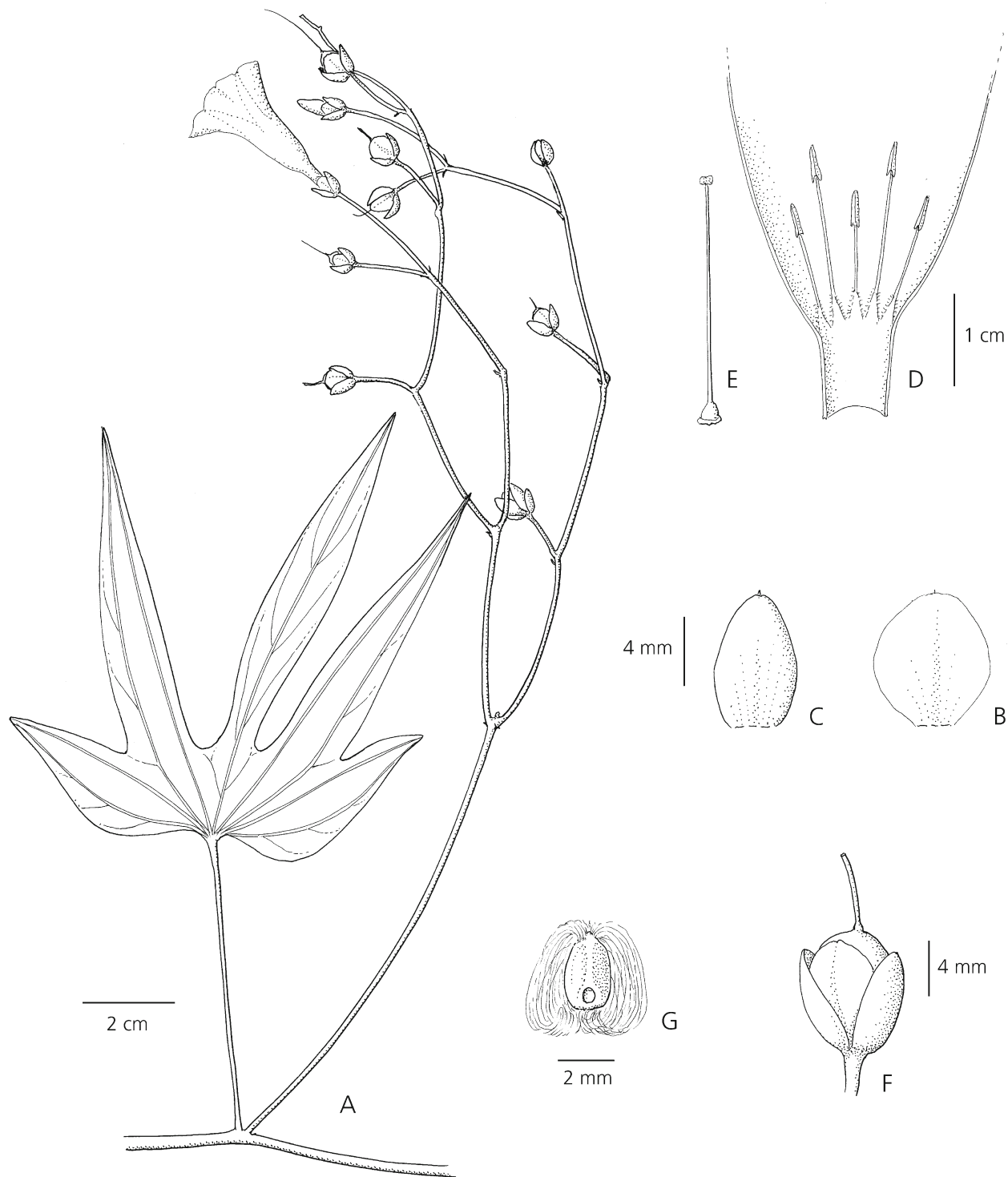


Fig. 3. *Ipomoea maranyonensis*. A habit; B outer sepal; C inner sepal; D corolla opened out to show stamens; E ovary and style; F calyx and capsule; G seed. A, F – G from R. Vazquez et al. 18569; B – E from R. Vazquez 23929. DRAWN BY ROSEMARY WISE.

including leaf shape and leaf indumentum, the much longer peduncles, the foliose bracteoles and acuminate sepals. It has also been identified as *I. sericophylla* Meisn. and the two species have a very similar leaf indumentum. *I. macarenaensis* is, however, readily distinguished by the much larger sepals (11 – 14

mm, not 6 – 8 mm long), larger corolla 5.5 – 6 cm, not 4.5 cm in length, and the much laxer, fewer-flowered cymes with foliose bracteoles. It is also similar to subsp. *velutina* of *I. megapotamica* but differs in the pilose indumentum of the sepals as well as their much larger size. It is almost certainly closest to *I. opulifolia* Rusby

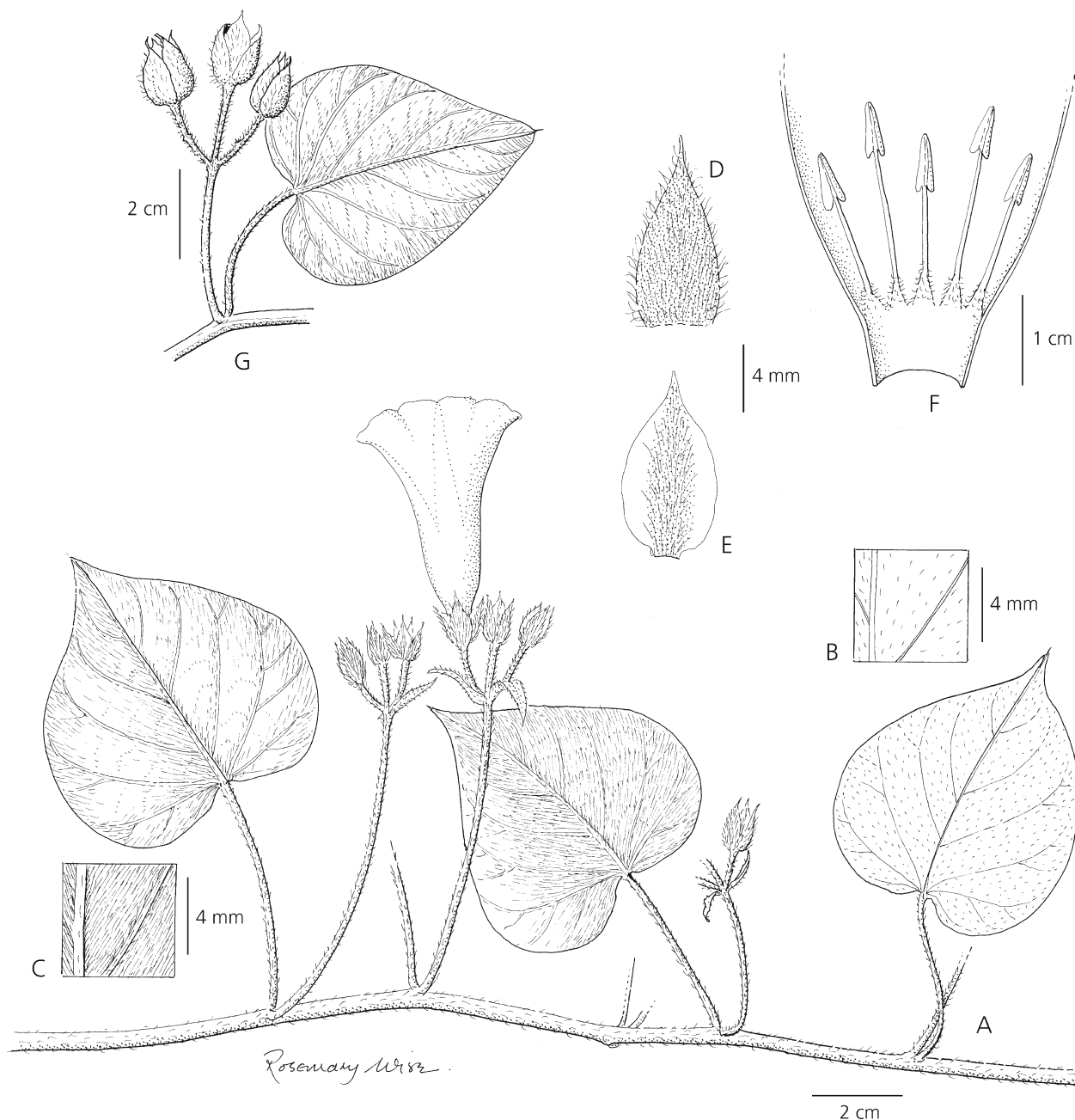


Fig. 4. *Ipomoea macarenaensis*. A habit; B adaxial leaf surface; C abaxial leaf surface; D outer sepal; E inner sepal; F corolla opened out to show stamens; G fruiting inflorescence. A – C from *W. R. Philipson et al.* 1322; D – G from *J. Cuatrecasas* 7778. DRAWN BY ROSEMARY WISE.

but the leaves are unlobed or only shallowly lobed and the sepals distinctly larger (11 – 14 mm, not 10 – 11 mm) and with conspicuous spreading, not appressed hairs. The outer sepals are acuminate, not obtuse. The bracteoles are larger and more persistent than in all these related species.

HABITAT & DISTRIBUTION. Endemic to Meta Department in Colombia where it grows at low altitudes in llanos (grassy plains) below the Serranía de Macarena (Map 2).

SPECIMENS EXAMINED. COLOMBIA. Meta: La Serranía entre los Ríos Ariari y Meta, 240 m, 19 Nov. 1939,

J. Cuatrecasas 7778 (US01123296, COL000104672); El Mico airstrip, last savannah before Río Guajar, 450 m, 6 Nov. 1949, *W. R. Philipson, J. M. Idrobo & A. Fernández* 1322 (holotype BM; isotypes COL000104674, MO, US).

CONSERVATION STATUS. Based on its very restricted area of occupancy and extent of occurrence this species would be assessed as Critically Endangered (CR). However, in the absence of any detailed understanding of its ecology or of its frequency in the two populations, any formal categorisation would be premature and it should be categorised as Data

Deficient (DD) until detailed studies can be carried out.

ETYMOLOGY. This species is named after the Serranía de Macarena in eastern Colombia, a mountain range and national park famous for its biodiversity.

NOTE. While this paper was in proof we have seen two additional specimens, which may represent another species or a variety of *Ipomoea macarenaensis*. These are Lindman 3189 (S) from Santa Cruz da Barra, Mato Grosso, Brazil and J. P. Coulleri et al. 166 (CTES) from near San Pablo, Marban in the Beni of Bolivia. The two collections are not quite identical but both resemble *I. macarenaensis* in their spreading indumentum and relatively persistent bracteoles but differ in the much smaller sepals and narrower linear bracteoles.

***Ipomoea pogonocalyx* J. R. I. Wood & Scotland, sp. nov.**

Type: Brazil, Maranhão, Mun. Tuntum, Palmerinha, 74 km de Tuntum, 27 Feb. 1983, J. U. Santos, E. L. Taylor, G. E. Schotz, N. A. Rosa, C. S. Rosário, T. Rebbeck, J. F. Silva & M. R. Santos 711 (holotype MG; isotypes FTG, K, NY, US).

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Twining perennial *herb* to 1.5 m, stem and all vegetative parts hirsute with rather stiff, whitish, spreading bulbous-based hairs. *Leaves* petiolate, 4 – 13 × 3.5 – 11 cm, ovate, cordate with rounded auricles, margin entire to slightly undulate, apex abruptly acute, both surfaces hirsute but abaxially paler; petioles 1.7 – 7.5 cm, hirsute. *Inflorescence* of axillary pedunculate cymes, usually with 5 flowers; peduncles 2.5 – 8.5 cm, hirsute, appearing somewhat flexuose; bracteoles 3 – 4 × 0.5 mm, linear, acuminate, caducous; secondary peduncles 1.3 – 2.3 cm; pedicels relatively long, 1.6 – 3.6 cm, slightly more hirsute than peduncles; sepals subequal, 12 – 15 × 8 – 9 mm, coriaceous, concave, elliptic-ovate, outer obtuse, abaxially hirsute when young, but hairs somewhat deciduous on the upper part when old, inner sepals rounded, glabrous except for a few hairs near base; corolla 6.5 – 7 cm, funnel-shaped, pink, glabrous; limb c. 3.5 cm diam.; stamens included. *Capsule* and *seeds* not seen. Fig. 5.

RECOGNITION. The coriaceous concave sepals of this species clearly indicate that it belongs to the same group of species as *Ipomoea mauritiana* and *I. maranyonensis*. It is readily distinguished from other species in this group by the long, somewhat stiff, spreading bulbous-based hairs that cover all vegetative parts including the outer sepals. The rather long pedicels suggest an affinity with *I. batatoides* and also perhaps with an undescribed species from the same region represented by Rosa & Santos 2011 (F, FTG, MG, NY). There is also a resemblance to *I. suaveolens*

(M. Martens & Galeotti) Hemsl. from Mesoamerica but the larger sepals and pink, funnel-shaped, not white, tubular corolla serve to distinguish the two species.

HABITAT & DISTRIBUTION. Endemic to Maranhão State in Brazil, where it is reported from rocky ground in semi-deciduous forest (G. Pereira-Silva & G. A. Moreira 11328) (Map 2).

SPECIMENS EXAMINED. BRAZIL. Maranhão: Mun, Tuntum, Palmerinha, 74 km de Tuntum, 27 Feb. 1983, J. U. Santos et al. 711 (FTG, K, MG, NY, US); Estreito, 6°35'25"S 47°27'21"W, 150 m, 8 March 2007, G. Pereira-Silva & G. A. Moreira 11328 (CEN).

CONSERVATION STATUS. Based on its apparently very restricted area of occupancy and extent of occurrence (one of the cited localities is imprecise) this species would probably be assessed as Critically Endangered (CR). However, in the absence of any detailed understanding of its ecology or of its frequency in the two recorded populations, any formal categorisation would be premature and it should be categorised as Data Deficient (DD) until detailed studies can be carried out.

ETYMOLOGY. This species is named *pogonocalyx* because of the prominent spreading hairs on the abaxial surface of the sepals, an unusual feature of species in the *Ipomoea mauritiana* clade.

***Ipomoea deminuta* J. R. I. Wood & Scotland, sp. nov.**

Type: Bolivia, Santa Cruz, Prov. Velasco, Camp. Flor de Oro, E. Gutiérrez, R. Quevedo & F. Mamani 1152 (holotype MO).

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Slender twining *herb* of unknown height; stems pubescent. *Leaves* petiolate, 1.5 – 2.7 × 0.4 – 1.2 cm, lanceolate-deltoid, obtuse to acute, mucronate, base cordate, auricles variable, rounded, acute, or rounded with a prominent tooth, adaxially tomentose, abaxially grey-tomentose; petioles 3 – 7 mm, densely pubescent. *Inflorescence* of very shortly pedunculate axillary flowers; peduncles 2 – 3 mm, densely pubescent; bracteoles 3 – 4 × 0.5 – 1 mm, filiform, tomentose, persistent, ±appressed to calyx; pedicels 0 – 1 mm; sepals subequal, 7 – 8 × 1 – 1.5 mm, lanceolate, acute, densely pubescent, inner slightly narrower with scarious glabrous margins; corolla 2 – 2.5 cm long, pale pink, funnel-shaped, glabrous, limb c. 1 cm diam.; stamens included, stigma biglobose. *Capsule* and *seeds* not seen. Fig. 6.

RECOGNITION. This very slender species is quite unlike any other *Ipomoea* known to us. The small corolla, very small, tomentose, lanceolate-deltoid leaves, solitary flowers, short peduncles, persistent

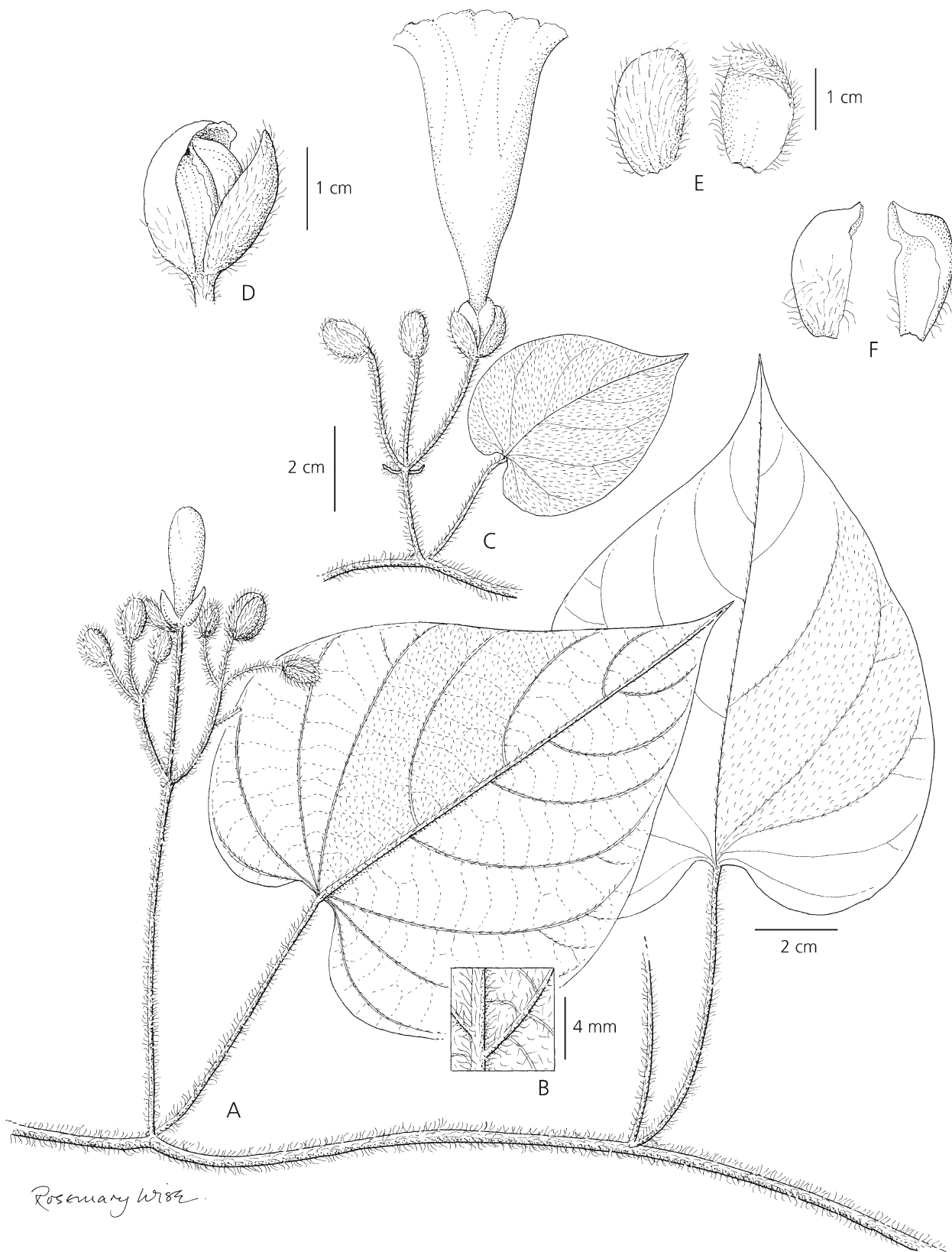


Fig. 5. *Ipomoea pogonocalyx*. A habit; B abaxial leaf surface; C inflorescence with corolla; D flower bud; E outer sepal, external (left) and internal (right) surfaces; F inner sepal, external (left) and internal (right) surfaces. A, D – F from J. U. Santos *et al.* 711; B – C from G. Pereira-Silva & G. A. Moreira 11328. DRAWN BY ROSEMARY WISE.

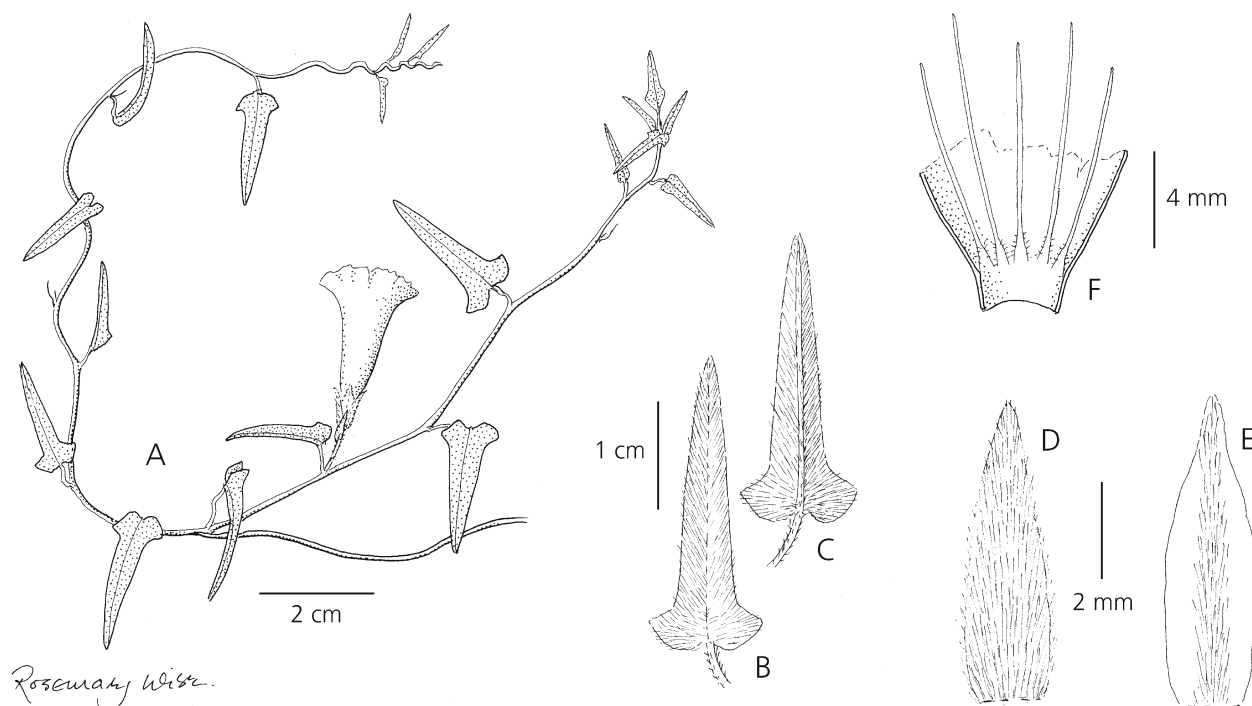


Fig. 6. *Ipomoea deminuta*. A habit; B adaxial leaf surface; C abaxial leaf surface; D outer sepal; E inner sepal; F corolla opened out to show insertion of filaments. From E. Gutiérrez et al. 1152. DRAWN BY ROSEMARY WISE.

bracteoles appressed to the calyx and suppressed pedicels all serve to separate it from all known species. Superficially it has some resemblance to the African *I. convolvuloides* Schinz but has a quite different inflorescence. Although we have not been able to sequence this species, we believe it is related to *I. eriocalyx* (= *I. hewittacea* (Kuntze) J. R. I. Wood & Scotland). It is similar in indumentum and leaf shape, particularly in the variable leaf auricles. The suppressed pedicels are also suggestive of this relationship but *I. deminuta* differs in many ways, including the small dimensions of its leaves and flowers but especially in its very short peduncles and tiny bracteoles.

HABITAT & DISTRIBUTION. Seasonally flooded pampa. Endemic to the Parque Noel Kempff Mercado in Bolivia, growing on the west bank of the Rio Iténez close to the frontier with Brazil (Map 2).

SPECIMEN EXAMINED. BOLIVIA. Santa Cruz: Prov. Velasco, PNNKM, Camp. Flor de Oro, Pampa húmeda SW del campamento, 13°33'03"S 61°03'31"W, 200 m, 25 May 1994, E. Gutiérrez, R. Quevedo & F. Mamani 1152 (holotype MO).

CONSERVATION STATUS. The site of the only known collection of this species lies within the protected area of the Noel Kempff Mercado National Park. No information is known about the size of the population. Flooded pampa is a common habitat within and around this national park as also in adjacent parts of Brazil but as there is no informa-

tion about the precise ecological requirements of this species, it is impossible to evaluate any threat that it may face. It can only be classified as Data Deficient (DD) in the absence of targeted searches to refind this species.

ETYMOLOGY. This species is named *deminuta* because of the small size of the plant in general, particularly its leaves, peduncles and pedicels.

Ipomoea megapotamica

Ipomoea megapotamica Choisy is the oldest name in a complex of species which includes *I. sericophylla* Meisn., *I. hieronymi* (Kuntze) O'Donnell, *I. argentinica* Peter, *I. longibarbis* J. R. I. Wood & Scotland, *I. decipiens* Dammer and several others. Most of these species have been described and discussed in Wood et al. (2015), where *I. megapotamica* was provided with a neotype in the absence of any original material or photograph of original material. The neotype ties this name to the form of this species found in Southern Brazil, Paraguay and Bolivia. This consistently differs from the form in NE Brazil in its minutely puberulent to scabridulous lower leaf surface; the abaxial surface of the leaves of plants from NE Brazil is almost always densely appressed pilose (Fig. 7J). Forms indistinguishable from the plant in NE Brazil are also found in Venezuela. We are, therefore recognising two geographical subspecies as set out below.

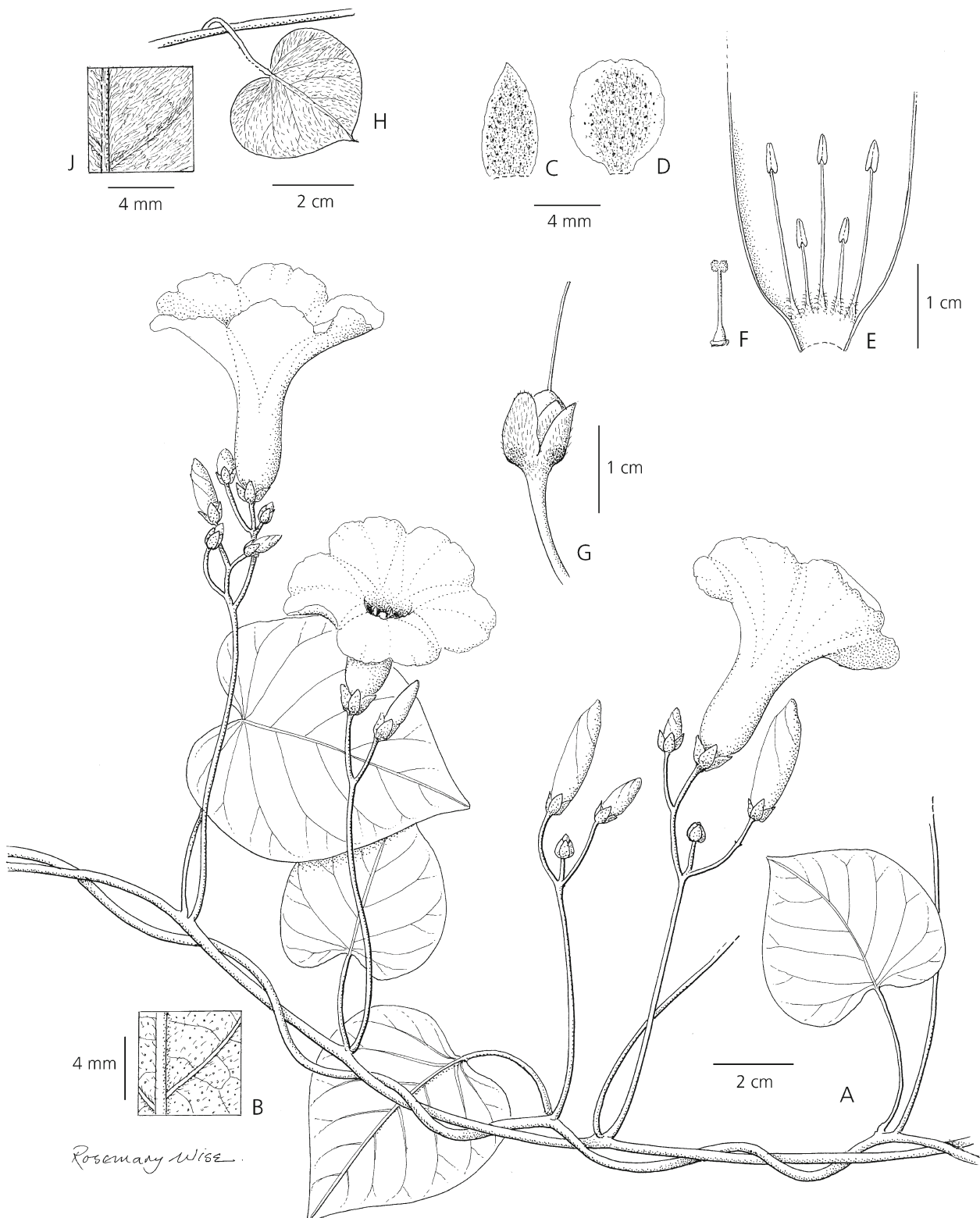


Fig. 7. *Ipomoea megapotamica* subsp. *megapotamica*. A habit; B abaxial leaf surface; C outer sepal; D inner sepal; E corolla opened out to show anthers; F ovary and style; G young fruit and calyx showing glands at base of sepals. *Ipomoea megapotamica* subsp. *velutina*. H leaf; J abaxial leaf surface. A – B from G. Hatschbach 23711; C – G from Fernández Casas & Molero 4302; H – J from A. Fernández-R et al. 9612. DRAWN BY ROSEMARY WISE.

Ipomoea megapotamica Choisy (1845: 375) subsp. ***megapotamica***. Type: “Uruguay”, Otto s.n. (syntype B, not found, presumably destroyed in 1943), neotype: Brazil, Mato Grosso do Sul, G. Hatschbach 23711 (NY01013991, designated by Wood *et al.* 2015: 59; isoneotypes F, MBM).

Ipomoea megapotamica var. *pauciflora* Meisn. (Meisner 1869: 259). Type: Southern Brazil, Sello s.n. (whereabouts unknown).

Argyreia megapotamica var. *puberula* Griseb. (Grisebach 1879: 263). Type: based on *Ipomoea megapotamica* Choisy.

Ipomoea megapotamica var. *cordifolia* Hassl. (Hassler 1911: 157). Type: Paraguay, Concepción, Naranjati, E. Hassler 10401 (lectotype G00175106, designated here).

Ipomoea vivianae Krapov. p.p. (Krapovickas 2009: 57).

Subsp. *megapotamica* is characterised by the abaxial surface of the leaves minutely puberulent to scabridulous. Fig. 7A – G.

DISTRIBUTION & HABITAT. This subspecies has a circum-Chaco distribution being found in Bolivia, Paraguay and Brazil, where it grows on the edges of seasonally dry forest. Map 3.

CONSERVATION STATUS. Least Concern (LC).

NOTES. The type and some paratypes of *Ipomoea vivianae* Krapov. represent an apparently distinct species distinguished from *I. megapotamica* by the nearly glabrous leaves, usually white corolla, distinctly

corky stems and, in particular, the often raceme-like inflorescence that develops on short shoots. However, many of the cited paratypes (Krapovickas 2009) including all we have seen from the Amambay region of Paraguay are *I. megapotamica* subsp. *megapotamica*.

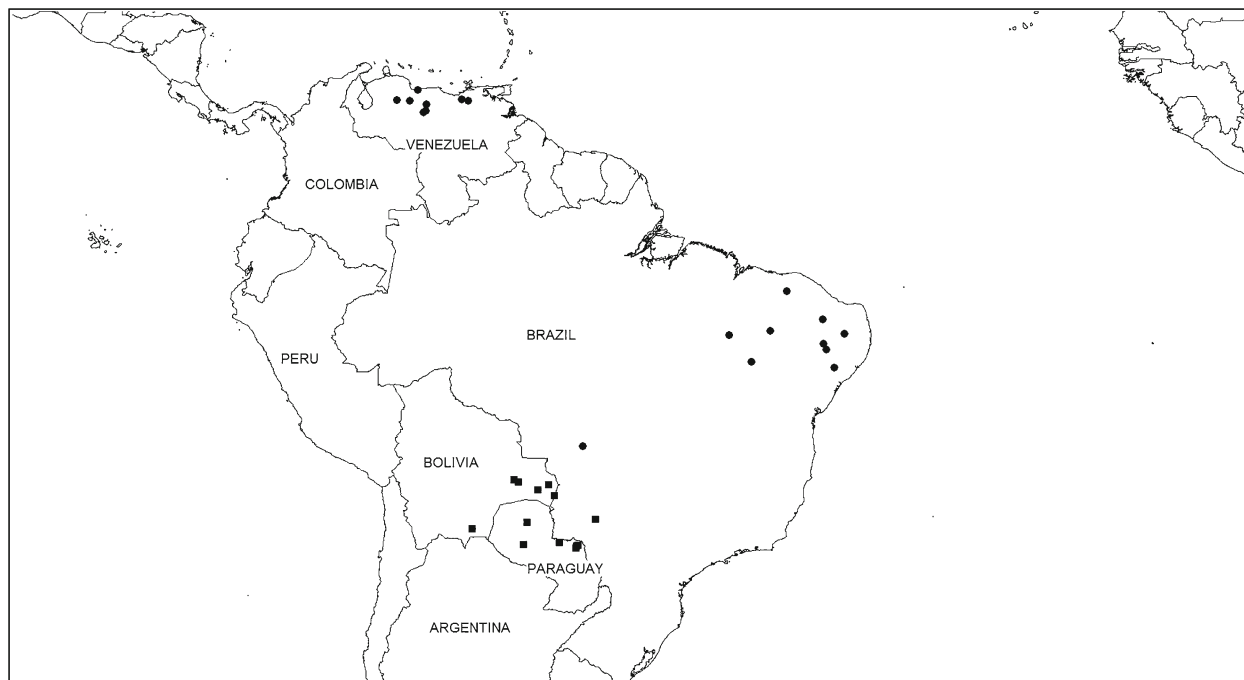
Wood *et al.* (2015) treated *Ipomoea subalata* Hassl. as a synonym of *I. megapotamica*. We now believe this to have been a mistake. Re-examination of images of the type of *I. subalata* shows a plant with similar corolla, sepal and leaf indumentum to *I. megapotamica* but the sepals are larger and similar in form to those of *I. chondrosepala* Hallier f. It fits neither species very well and its exact identity cannot be resolved without further collections from NE Paraguay.

Ipomoea megapotamica subsp. ***velutina*** J. R. I. Wood & Scotland, **subsp. nov.** Type: Brazil, Pernambuco, Tapera, Aug. 1933, B. Pickel 3037 (holotype RB00263114; isotypes NY, P).

<http://www.ipni.org/urn:lsid:ipni.org:names:60473795-2>

Ipomoea nyctaginea var. *cordifolia* Choisy (1845: 369). Type: Brazil, Piahu, Martius 2482 (lectotype M0185009, designated here).

Subsp. *velutina* is characterised by the densely adpressed pilose abaxial surface of the leaves, the hairs long and conspicuous. Fig. 7H – J.



Map 3. Distribution of *Ipomoea megapotamica* subsp. *megapotamica* (■) and subsp. *velutina* (●).

TYPIIFICATION. There are two specimens of *Martius* 2482 at Munich but we are designating M0185009 as the lectotype of *Ipomoea nyctaginea* var. *cordifolia* as it is annotated “*Ip nyctaginea*. β (Choisy)” in a different hand from the label, possibly that of Choisy. The other specimen (M0185010) bears only the original annotation “*Ipom. subrepanda*” and may not have been seen by Choisy even though it is a better specimen and was labelled as holotype by McDonald in 1982.

We have treated this subspecies as a new subsp. *velutina* to avoid confusion between *Ipomoea megapotamica* var. *cordifolia* Hassl. and *I. nyctaginea* var. *cordifolia* Choisy which represent different taxa.

DISTRIBUTION & HABITAT. Dry forest (caatinga) and scrub in NE Brazil and Venezuela. Map 3.

SELECTED SPECIMENS EXAMINED. BRAZIL. Alagoas: Pão de Açucar, 9°42'S 37°30'W, 22 June 2002, *Lyra-Lemos et al.* 6889 (RB). **Ceará:** Planalto de de Ibipaba, Mun. de Carnaubal, 4°10'S 40°55'30"W, 30 April 2010, *E. B. Souza* 1842 (UFR). **Maranhão:** 5 April 1962, Mun. Loreto, 7°21'S 45°7-8'W, *G. & L. T. Eiten* 4051 (US). **Mato Grosso:** Chapada dos Guimarães, Feb. 1995, *B. Dubs* 1840 (ARIZ, S, Z). **Paraíba:** 25 May 1959, *Coelho de Moraes* 2126 (MO, US). **Pernambuco:** Tapera, 8°24'S 38°05'W, Aug. 1933, *B. Pickel* 3037 (holotype RB; isotypes NY, P); Serra Talhada, 7°59'S 38°17'W, April 1971, *E. P. Heringer et al.* s.n. (RB). **Piauí:** Caracol, P.N. Serra das Confusões, 9°15'51"S 43°29'40"W, 10 April 2009, *G. Martinelli et al.* 16358 (RB). **Rio Grande do Norte:** Agua Nova, 6°13'S 38°21'W, *A. C. Sarmiento* 761 (K, RB). **VENEZUELA. Portuguesa:** Araure, orillas del Rio Auro, 9°43'N 69°16'W, 300 m, 13 Sept. 1984, *G. Aymard & F. Ortega* 3078 (NY). **Guarico:** Mesa de el Sombrero, *H. Pittier* 12486 (US). **Cojedes:** Las Peonías, 26 Sept. 1975, *Delascio* 3401 (FTG). **Monagas:** Mun. Freitas, 10 km al E de Úrica, 9°39'N 64°04'W, 360 m, Oct. 1996, *A. Fernández-R et al.* 9612 (US).

CONSERVATION STATUS. Least Concern (LC). However, we have very little information about the size or status of populations in Venezuela so it might be best to treat this species as Data Deficient (DD) in that country.

NOTES. The two subspecies are readily recognisable and are geographically separate although *Dubs* 1840 could be interpreted as intermediate geographically and morphologically but is certainly closer to subsp. *velutina*. More controversial is the delimitation of species related to *Ipomoea megapotamica*. Austin (1982) considered the Venezuelan specimens cited above to belong to *I. subsericea* Meisn. but we regard that species as restricted to Minas Gerais and Goiás in Brazil and distinct on account of the absence of conspicuous glands on the sepals, which are acute, not mucronate, and more densely tomentose. The peduncles are also shorter so the cymes are exceeded by the leaves. Although we accept that species delimitation is difficult in this complex and that some intermediates may occur, any attempt to unite all related species will

result in an unsatisfactory, counter-intuitive aggregate. *I. megapotamica* is any case the oldest name in this complex.

Ipomoea subsericea should be deleted from the list of species occurring in Venezuela. All records from Venezuela appear to belong to *I. megapotamica* subsp. *velutina*.

Ipomoea chenopodiifolia* and *I. retropilosa

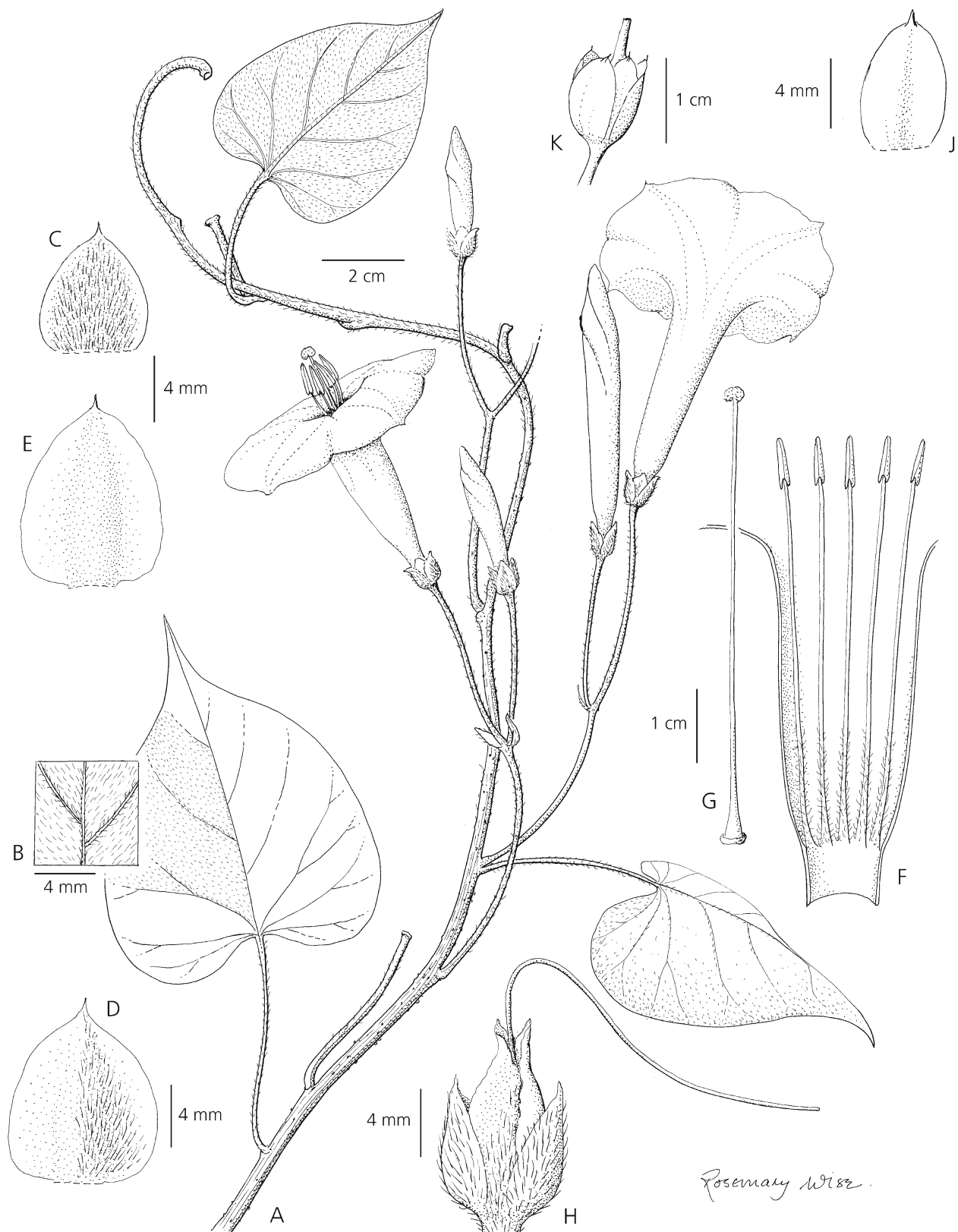
The earliest reference to the occurrence of *Ipomoea chenopodiifolia* in South America that we have found is on herbarium sheets annotated by O'Donnell in 1953 under the name *I. signata* House, now generally accepted as a later synonym of *I. chenopodiifolia* (M. Martens & Galeotti) Hemsl. *I. chenopodiifolia* remains an accepted species for Venezuela (for example, Austin *et al.* 2012) although the Venezuelan populations are very disjunct from the main populations in Guatemala and Chiapas and doubts were raised almost 30 years ago by McDonald (1987: 57) about the correct identity of the Venezuelan plants.

There are very few collections of *Ipomoea chenopodiifolia* from Venezuela (see below) and on examination these proved indistinguishable from *I. retropilosa* (Pittier) D. F. Austin, itself a poorly known species. Austin (1982) distinguished the two species by the shape of the corolla, claiming that *I. retropilosa* could be separated by its funnel-shaped corolla from *I. chenopodiifolia* with its hypocrateriform corolla with exserted stamens. *I. retropilosa*, in fact, has a hypocrateriform corolla and it is difficult to explain Austin's error as Pittier (1931: 143) clearly describes the corolla of *I. retropilosa* as characterised by “tubo recto, limbo subplano ...staminibus ..longe exsertis...” except by the fact that none of the isotypes in North American herbarium show the corolla clearly; the hypocrateriform corolla can only be easily seen on the Geneva isotype, which appears to be the only type number with a corolla.

All Venezuelan specimens named *Ipomoea chenopodiifolia* or *I. signata* conform closely to the type of *I. retropilosa*, which we regard as the correct name for these Venezuelan plants. They all differ from material of *I. chenopodiifolia* from Chiapas and Guatemala by the indumentum as well as the shape and size of the sepals, which are hirsute, subequal, broadly ovate but never more than 9 mm long, rather than glabrous, distinctly unequal, lanceolate to narrowly ovate with the inner sepals up to 13 mm long (Fig. 8E). *I. chenopodiifolia* should be deleted from the list of species known from Venezuela.

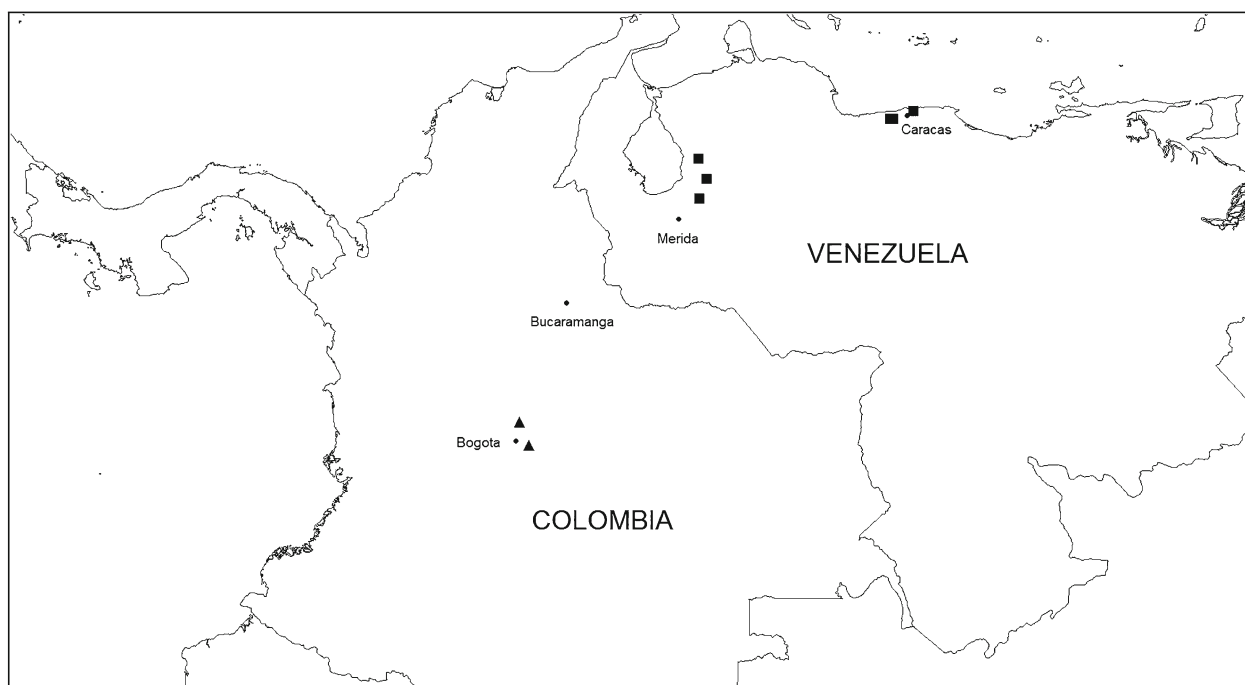
***Ipomoea retropilosa* (Pittier) D. F. Austin (1977[pub. 1978]: 337).**

Exogonium retropilosum Pittier (1931: 143). Type: Venezuela, Mérida, Timotes, 2000 m, 23 Jan. 1928,



Rosemary Wise.

Fig. 8. *Ipomoea retropilosa* subsp. *retropilosa*. A habit; B abaxial leaf surface; C outer sepal; D middle sepal; E inner sepal; F corolla opened out to show stamens; G ovary, style and stigma; H young fruiting calyx. *I. retropilosa* subsp. *cundinamarcana*. J outer sepal; K calyx with rostrate apex to capsule. A – H from J. B. Simmons 281; J – K from André S.N. DRAWN BY ROSEMARY WISE.



Map 4. Distribution of *Ipomoea retropilosa* subsp. *retropilosa* (■) and subsp. *cundinamaricana* (▲).

H. Pittier 12698 (holotype VEN!; isotypes FI, G!, MO!, US!).

Ipomoea signata sensu Austin (1982) et *I. chenopodiifolia sensu* Austin & Huáman (1996) quoad records from South America.

HABITAT & DISTRIBUTION. Apparently growing in cloud forest near streams in the coastal sierra of Venezuela between 1500 and 1800 m approximately. Map 4.

SPECIMENS EXAMINED. VENEZUELA. Mérida, Colonia Tovar, 1865, *Moritz* 1686 (BM, K); 8 km S of Timote[s], 1976, *J. B. Simmons* 281 [K], Distrito Ricaurte, 3 km E of Colonia Tova[r], 10°24'S 67°14'W, 1800 – 1850 m, *J. A. Steyermark* & *R. L. Liesner* 121997 (MO); Trujillo, Varela, 1500 m, *L. Aristeguieta* 4884 (MO).

CONSERVATION STATUS. Based on an area of occurrence of slightly more than 17,000 km this species might be classified as Vulnerable (VU) but based on an area of occupancy of 24,000 km² it might be classified as Endangered (EN). Given the relative accessibility of the cloud forest in Andean Venezuela over more than 150 years and the paucity of records, the categorisation of Endangered (EN) would seem correct, particularly as several of the recorded sites lie near centres of population. Some populations may lie within one or more of the protected areas established in Andean Venezuela but this requires confirmation.

NOTE. Map 4 shows the somewhat disjunct populations of *Ipomoea retropilosa* in Venezuela. Although there is

variation in the density of the indumentum, no clear geographical patterning in this variation was observed. Plants nearly identical to *Ipomoea retropilosa* also grow very locally in Colombia but differ in the completely glabrous sepals. In the absence of any other discernible differences we treat this distinct population as a subspecies as follows:

Ipomoea retropilosa* subsp. *cundinamaricana *J. R. I. Wood* & *Scotland*, **subsp. nov.** Type: Colombia, Cundinamarca, Quebrada el Chico, al norte de Bogotá, 2700 – 2800 m, 30 Nov. 1952, *H. Humbert*, *J. Idrobo* & *R. Jaramillo* 27532 (holotype P03538230).

<http://www.ipni.org/urn:lsid:ipni.org:names:77160015-1>

RECOGNITION. Subsp. *cundinamaricana* is distinguished from subsp. *retropilosa* by its completely glabrous sepals. The young stems and abaxial surface of the leaves are also glabrous. Fig. 8J.

HABITAT & DISTRIBUTION. No details are known of the plant's habitat but it is only known from the Eastern Cordillera of Colombia in Cundinamarca from two records. It is likely to be a cloud forest species and is obviously rare and endemic to this area of Colombia. The only cited altitude is 2700 – 2800 m, significantly higher than the recorded locations of subsp. *retropilosa* in Venezuela.

SPECIMENS EXAMINED. COLOMBIA. Cundinamarca, north of Bogotá, 30 Nov. 1952, *Humbert et al.* 27532 (P); “Villavicencio?”, [1875 – 6], *E. André* 137 (K).

CONSERVATION STATUS. This subspecies is only known from two collections, the most recent made over 60 years ago. It might possibly be extinct but is more probably Endangered (EN). Although the cloud forests of Colombia’s Eastern Cordillera have been much reduced, much still survives and it is highly likely that targeted searching will reveal surviving populations.

NOTES. The glabrous sepals of subsp. *cundinamarcana* mean that this subspecies can only be reliably distinguished from *Ipomoea chenopodiifolia* by the subequal, broader, ovate sepals less than 9 mm in length.

This species (and its subspecies) are not accounted for in the recent *Catalogue of Colombian plants* (Bernal *et al.* 2015). However it is quite likely that there is an isotype in the Colombian national herbarium (COL) as the holotype was collected in the company of two Colombian botanists.

Ipomoea austinii

Ipomoea austinii Infante-Bet. was recently described from NE Colombia based on a single collection (Infante-Betancour 2014). The author compared it with a number of American species but was unable to recognise any obvious affinities. This is unsurprising as the plant is the very distinctive African *I. involucrata* P. Beauv. as can be clearly seen from the good illustration that accompanies the paper. The plant was collected once from an oil palm plantation and was perhaps introduced to Colombia with the oil palm plants. The synonymy is set out below:

***Ipomoea involucrata* P. Beauv.** (Palisot de Beauvois 1816: 52). Type: Nigeria, Oware, *P. de Beauvois* (holotype G00023040).

Convolvulus perfoliatus Schumacher & Thonn. (Schumacher & Thonning 1827: 89). Type: Ghana, Thonning s.n. (syntypes C).

Ipomoea austinii Infante-Bet. (Infante-Betancour 2014: 248). Type: Colombia, Cesar, San Alberto, *M. Carillo-F.* 557 (holotype COL).

There is evidence for a number of introductions of *Ipomoea* from the Old World. *I. rubens* Choisy may have been introduced in pre-historic times as it gives every appearance of being native in the neotropics. *I. cairica* (L.) Sweet, *I. obscura* (L.) Ker-Gawl. and *I. ochracea* (Lindl.) G. Don have long been naturalised. *I. tiliifolia*

(Desr.) Roem. & Schult. is well-established in the Galapagos Islands. More recent introductions include *I. eriocarpa* R. Br. in Puerto Rico and now *I. involucrata* in Colombia.

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