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A glimpse into the diversity of Colombian Acanthaceae

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Summary. A short visit to four Colombian herbaria in 2022 is highlighted as an example of modern-day herbarium plant hunting which resulted in the discovery of 14 new species: *Aphelandra guacharorum* J.R.I.Wood, *A. montistusae* J.R.I.Wood & Hoyos-Gómez, *Justicia betancurii* J.R.I.Wood, *J. chloroleuca* J.R.I.Wood, *J. cristalina* J.R.I.Wood & Hoyos-Gómez, *J. daironcardenasii* J.R.I.Wood & Hoyos-Gómez, *J. ipanorensis* J.R.I.Wood, *J. lutescens* J.R.I.Wood & Hoyos-Gómez, *J. macuirensis* J.R.I.Wood, *J. perijaensis* J.R.I.Wood, *J. reniformis* J.R.I.Wood, *J. rheophytica* J.R.I.Wood & Hoyos-Gómez *J. santanderana* J.R.I.Wood & Hoyos-Gómez and *Ruellia rheophytica* J.R.I.Wood & Hoyos-Gómez. These are described and illustrated with line drawings. Additionally, a full description and line drawings of two poorly known species, *Justicia hochreutineri* J.F.Macbr. and *J. trianae* (Leonard) J.R.I.Wood are provided. Notes are provided on 21 other species drawing attention to new records for Colombia, rediscoveries and taxonomic issues. *Justicia hochreutineri* J.F.Macbr., *J. pilosa* (Ruiz ex Nees) Lindau, *J. zamorensis* Wassh. and *Stenostephanus lasiostachyus* Nees are recorded for the first time for Colombia. *Justicia pampolystachys* Leonard is treated as a synonym of *J. hyperdasya* Leonard. *Poikilacanthus moritzianus* (Nees) Lindau is shown to be restricted to Venezuela. *Adhatoda pilosa* Ruiz ex Nees is lectotypified. Attention is drawn to the number of rheophytes in Colombian Acanthaceae and to the importance of the Río Claro and Río Samaná Norte area of Antioquia as a centre of plant diversity.

Key Words. *Aphelandra*, herbaria, hotspots, *Justicia*, new species, plant hunting, rheophytes, *Ruellia*.

Introduction

The recently published *Catálogo de Plantas y Líquenes de Colombia* (Bernal *et al.* 2016) lists 23,756 species of flowering plants, so placing Colombia amongst the richest countries in the world in terms of plant diversity, behind only much larger countries, such as Brazil and China. Amongst the plant families occurring in Colombia, Acanthaceae is in 13th place with 355 species. More remarkable, however, is the level of endemism as 210 of these species are endemic to Colombia constituting 60% of the family total. This is the highest level of endemism amongst the 22 families with more than 250 species recorded. This high level of endemism appears to be genuine as there is no evidence to suggest that the majority of species are other than extremely localised in their distribution. Country endemism is a feature of all major Acanthaceae genera recorded from Colombia.

By one measure the Acanthaceae of Colombia are well-studied. E. C. Leonard (1951 – 1958) published a full account of the family in three parts, one of the few specialised revisions of the family published for any tropical country outside the context of a flora account — and these are rare enough. However, since then, there has been almost no publication on Colombian Acanthaceae apart from Wasshausen's monograph of *Aphelandra* (1975), several short papers by Wasshausen (1977, 1984, 1985, 1989) describing new species and a lengthy paper by Wood (1988). Nothing significant has been published for over thirty years and no Colombian botanist has published research on the family.

Leonard's revision is a comprehensive work in many respects but has serious flaws. Leonard never conducted fieldwork in Colombia and, more seriously, never visited Colombian herbaria. It is uncertain whether he received loan material from Colombia, and it appears his account was entirely based on material in United States and European herbaria. He seems to have ignored several publications he should have been aware of, including the publication of *Habracanthus sanguineus* Nees (1847) and *Adhatoda lindeniana* Nees (1847), and misinterpreted or ignored descriptions published by earlier botanists, such as Lindau (1897b) or Turrill (1920). Most seriously, he had a very narrow species concept in his treatment of several genera. Some 30 species of *Aphelandra* R.Br. he described were reduced to synonymy with other species by Wasshausen (1975) and 15 species each of *Dicliptera* Juss. and *Stenostephanus* Nees were similarly treated by Wood (1988, 2009). However, Leonard's tendency to describe the same species multiple times under different names is not so apparent in *Justicia* L. where most of the 80 odd species he described are still accepted (Wood 1988: 42).

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The publication of the *Catálogo de Plantas y Líquenes de Colombia* (Bernal *et al.* 2016), suggested the existence of a probable large hole in our knowledge of Colombian Acanthaceae by noting that many species were still apparently known only from the type. Three quarters of a century has passed since Leonard's revision and extensive fieldwork by Colombian botanists has taken place since but few of these new collections have been studied either inside or outside of Colombia. As the first author had lived in Colombia for three and a half years in the 1980s and studied Acanthaceae while working for the Ministry of Education and the British Council, he was strongly tempted to return to investigate the situation as he was in a favourable position to do this given his experience in Colombia and research in Acanthaceae elsewhere in South America. However, covid and personal factors delayed his visit until October 2022 when he was able to visit four Colombian herbaria, two in Bogotá and two in Medellín.

According to *Index Herbariorum* (http://sweetgum.nybg.org/science/ih/) there are currently 41 recognised herbaria in Colombia, and it was clearly impossible to visit all, especially within the timescale of a two-week visit. Efforts, therefore, were focused on the two largest herbaria, those in the Universidad Nacional (COL) and in the Universidad de Antioquia (HUA) but the opportunity was taken to visit one additional herbarium in Bogotá (COAH) which specialises in plants of the Amazon basin and another in the Botanical Garden in Medellín (JAUM). This meant that he did not visit 37 herbaria and in consequence, inevitably missed many species and the results below are only a partial snapshot of the diversity in Colombian Acanthaceae. The weakest coverage geographically was the southwest of the country, Nariño, Cauca and Valle. A visit to the main herbarium in Cali was an obvious omission.

Even with only four herbaria to visit, time constraints were a major factor. Before departure it was decided to prioritise two genera, *Stenostephanus* Nees and *Justicia*, the former because it was the genus the first author had studied most intensively and the latter because it was the largest with some 90 species. Other genera were studied but much less intensively as there was little remaining time after the routine naming of specimens. It is clear, therefore, that both in terms of geographical coverage of herbaria and in terms of generic coverage this paper has major limitations. However, there is little doubt that these limited results are impressive in the circumstances described and constitute strong evidence of the richness of the Colombian Acanthaceae flora and of the need for further research.

This project developed during the first author's visit to Colombia with considerable assistance provided in Bogotá by David Granados and in Medellín by Saúl E. Hoyos-Gómez, without which results would have been much more limited, After Wood's return to the United Kingdom, follow-up and support in finding and examining specimens continued so this paper is rightly attributed to three authors.

Materials and Methods

The preparatory stage for Wood's visit to Colombia and consequently this paper consisted of a study of relevant literature and the examination of herbarium specimens. The literature consisted principally of works by Leonard (1951 – 58), Wasshausen (1975) and Wood (1988) together with the accounts of Acanthaceae in the neighbouring countries of Ecuador (Wasshausen 2013), Panama (Durkee 1978) and Costa Rica (McDade 2020). Specimens examined were those at Kew (K) and the Natural History Museum (BM), including many types and extensive material from Peru, which had been loaned by various institutions. Of greatest importance were the type images available through Jstor (https://plants.jstor.org/). These were carefully examined and downloaded prior to travel. Another important aspect of preparation was the establishment of contacts in Colombia, principally at COL and HUA, in particular with David Granados and Saúl E. Hoyos-Gómez. Herbarium acronyms follow Thiers 2023, continuously updated.

The middle stage of the study consisted of visits to COL and COAH in Bogotá and to HUA and JAUM in Medellín. These visits involved the revision of all specimens of *Justicia* and *Stenostephanus* in each herbarium together with a less thorough examination of unidentified Acanthaceae specimens in other genera, particularly *Aphelandra*, *Dicliptera*, *Hygrophila* R.Br., *Pseuderanthemum* Radlk., *Ruellia* L. and *Stenandrium* Nees, focusing on specimens drawn to my attention by Colombian colleagues. The identification of numerous specimens was updated and material of many putative new species was separated out. As there are many practical difficulties in borrowing specimens from Colombia, draft descriptions of well-marked new taxa, mostly represented by several collections were prepared. Specimens were examined visually using a hand lens and stereo microscope to observe floral details. Botanical artists in Colombia, Marcela Morales in Bogotá and Cristina Pareja in Medellín, were commissioned to prepare drawings of the new species. Equally important was the establishment of partnerships with Colombian botanists, David Granados (Bogotá) and Saúl E. Hoyos-Gómez (Medellín) to carry forward the process of publishing results.

The final stage entailed the preparation of the illustrations and the follow-up of any missing information. This involved further detailed examination and dissection of specimens using a stereo microscope, enabling

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confirmation of initial observation during the herbarium visits by the first author. Crucially the descriptions, line drawings and photographs were brought together with other information in preparation for this publication. This paper presents illustrations and full descriptions of 14 new species and two poorly understood species. Notes were prepared on species which were previously known only from the type according to the *Catálogo de Plantas y Líquenes de Colombia* (Bernal *et al.* 2016) or were new records for Colombia. Some typification, taxonomic, phytogeographical issues are also discussed and a few synonymies are noted.

Results

CONSERVATION ASSESSMENTS. This paper describes 14 new species and provides additional information on many poorly known species. The authors are, with few exceptions, unfamiliar with these plants in the field and the data available from the herbarium sheets is mostly minimal. Even in those cases where several collections are known, we have no idea of the size of the different populations or, in nearly all cases, of the likely threats to the survival of a species. The true status of all species discussed in this paper is Data Deficient (DD) according to IUCN (2022) guidelines, even those known from the national parks. It is hoped that the recognition of these species will stimulate fieldwork leading to the rediscovery of individual species and the assessment of their population size as well as the identification of any threats they may face. We have indicated where a plant grows in a protected area, and it is hoped that their presence will enhance the biodiversity value and profile of these reserves. The presence of several endemic Acanthaceae in the Río Claro and Río Samaná Norte area, discussed below, almost certainly indicates that this area is a hotspot of plant diversity and merits an enhanced protection status — it currently lies outside the national park network.

RHEOPHYTES. This study has highlighted the existence of a number of Acanthaceae rheophytes, particularly in *Justicia*. These are plants adapted to the specialised habitat of seasonally flooded rocks at the side of a usually narrow stream bed. They differ from riparian species by their ability to withstand flash floods and strong currents (Hoyos-Gómez *et al.* 2022). Characteristically these species are anchored to streamside rocks by a tough mat of fibrous roots and have narrow oblong or lanceolate, somewhat coriaceous leaves which are not easily broken off in floods (Hoyos-Gómez & Bernal 2018). The inflorescence is usually terminal and relatively compact, sometimes enclosed by bracts (Steenis 1981). Some more widespread Acanthaceae are characteristic of, but not restricted to, this habitat including *Justicia comata* (L.) Lam., *J. pectoralis* Jacq., *J. polygonoides* Kunth, *Lepidagathis alopecuroidea* (Vahl) R.Br. ex Griseb. and *Hygrophila costa* Nees. Others, however, appear to be obligate rheophytes, including *H. tyttha* Leonard and a number of endemic species, *Justicia namatophila* Leonard, and three new species described in this paper, *J. rheophytica* J.R.I.Wood & Hoyos-Gómez, *J. ipanorensis* J.R.I.Wood and *Ruellia rheophytica* J.R.I.Wood & Hoyos-Gómez. All these endemic species occur in the Río Claro and Río Samaná Norte area of Antioquia discussed in the next paragraph with the exception of *J. ipanorensis*, which is found along the Río Vaupés near the Brazilian border. It is highly likely that other rheophytes will be found in Amazonian Colombia. Indeed, there is a specimen of an unidentified rheophytic *Justicia* from the Río Mesay in the P.N. Chiribiquete in Caquetá (Fundación Biológica Rastrojo CHI-13) at Kew. It is to be expected that *Justicia cataractae* Leonard will also be found as it was described from the Danta (Tapir) Falls in the Río Cuao across the border from Vichada in Venezuela.

RIO CLARO AREA. The canyons of the Río Samaná Norte, Quebrada La Cristalina and Río Claro comprise a complex of neighbouring valleys in an area of karst limestone, mostly in the Municipio de San Luis in eastern Antioquia but extending along the Río Manso into neighbouring parts of Caldas. The canyon sides are densely forested with evergreen woodland above the riverbed. Both the forested sides and the steep seasonally flooded sides of the rivers are rich in endemic species, particularly from the family Acanthaceae. As well as the rheophytes mentioned above, several other endemic species of *Justicia* are found on the forested valley sides including *J. reniformis* J.R.I.Wood, *J. cristalina* J.R.I.Wood & Hoyos-Gómez and *J. daironcardenasii* J.R.I.Wood & Hoyos-Gómez as well *J. magdalenensis* J.R.I.Wood. The concentration of endemic species in this region strongly suggests that this area of karst limestone merits more detailed study both to prepare a complete species inventory and to evaluate how its long-term preservation can be secured. It appears to face potential threats from diverse forms of tourism as well the mining of limestone for cement manufacture (Hoyos-Gómez & Bernal 2018) and certainly merits designation formally as a protected area.

FRONTIER SPECIES. The boundaries of Colombia and neighbouring countries were not established until relatively recent times and are not always well-marked on the ground. We have included several species which might have been collected in neighbouring countries, *Justicia ipanorensis* collected by Spruce along the Río Vaupés somewhere close to the present frontier between Colombia and Brazil, and *Adhatoda lindeniana* Nees (*Justicia hochreutineri* J.F.Macbr.) collected by Linden from "Colombia," presumably somewhere in

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Map 1. Colombia, showing locations of principal places mentioned in this paper.

the Sierra de Perijá (Map 1). *Stenostephanus diversicolor* (Lindau) J.R.I.Wood is another species from the same border area whereas *Poikilacanthus moritzianus* (Nees) Lindau appears to be restricted to Venezuela despite records from Colombia.

Aphelandra *R.Br.*

Although there is a relatively modern revision of *Aphelandra* (Wasshausen 1975), there are numerous unidentified specimens in the different Colombian herbaria. Within the time constraints of this project, only a superficial examination of this extensive material was possible with the recognition of the two following new species:

Aphelandra guacharorum *J.R.I.Wood*, **sp. nov.** Type: Colombia, Huila, Acevedo, Parque Nacional Natural Cueva de los Guácharos, 1°36'14"N 76°8'13"W, 1900 m, 25 Jan. 2010, *Pablo Stevenson, Edgar Cifuentes & Mónica Ramírez* 2840 (holotype COL-000465336).

http://www.ipni.org/urn:lsid:ipni.org:names:77338112-1

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Shrub 1.7 m high, stems lacking spinulose interpetiolar bracts, scurfy when young, glabrescent. *Leaves* petiolate, lamina 4 – 16 × 2.5 – 7.5 cm, oblong-elliptic to obovate, shortly acuminate, base narrowly cuneate, margin irregularly serrate, the teeth spine-tipped, adaxially sparsely hirtellous especially on the veins, abaxially paler, glabrous except for the pubescent veins, veins 10 – 12 pairs; petiole 1 – 2.8 cm, hirtellous. *Inflorescence* of terminal and axillary spikes, 4 – 10 cm long; peduncles 1.3 – 1.5 cm, densely pubescent with brownish hairs; rhachis densely pubescent with brownish hairs; flowers imbricate, sessile; bracts 12 – 14 × 4 mm, ovate, terminating in a spine, the margin with one spine-tipped lateral tooth, veins puberulent; bracteoles 11 – 18 × 3 – 5 mm, ovate, acuminate, terminating in a spine, puberulent on the veins; calyx 5-lobed to base, the lobes c. 16 – 18 × 5 – 6 mm, slightly unequal, obovate-spathulate, mucronate, sometimes with spine-tipped lateral teeth; corolla 3.5 cm long, red, pubescent, upper lip 5.5 – 6 mm long, shallowly lobed, lower lip 2 – 3 mm long, spreading to recurved, 3-lobed with rounded lobes; stamens 4, filaments pubescent, anthers exserted c. 5 mm, the thecae linear, 4 – 5 × 1 mm, minutely crisped hairy on the dorsal surface; ovary glabrous, style 4 – 4.5 cm long, glabrous. *Capsule* and *seeds* not seen. Fig. 1.

RECOGNITION. Distinguished by the absence of spiny interpetiolar bracts and the presence of serrate leaves with spine-tipped teeth, so recalling *Aphelandra zamorensis* Wassh. but immediately distinguished inter alia by the presence of teeth on the margins of the bracts (vs entire), the red (not greenish-yellow) corolla and the stamens shortly exserted to c. 5 mm (vs exserted to c. 35 mm).

DISTRIBUTION AND CONSERVATION. This species is only known from the Parque Nacional Natural Cueva de los Guácharos, which is the oldest national park in Colombia. No details of the frequency or the exact habitat of the species are known but the forest is reported to be relatively intact although there are reports of illegal settlement, timber extraction and coca plantation within the park. The existence of only a single collection of this species suggests it is rare.

SPECIMENS EXAMINED. Only known from the type collection.

HABITAT. Tropical montane forest.

ETYMOLOGY. This species is named after the oilbirds (Guácharos) which give their name to the national park where this plant is found.

Aphelandra montis-tusae *J.R.I. Wood & Hoyos-Gómez*, **sp. nov.** Type: Colombia. Antioquia: Mun. de Venecia, Parque Natural y Arqueológico Cerro Tusa, 5°57'45"N 75°46'32"W, 1300 m, 19 Dec. 2020, *Saúl E. Hoyos-Gómez, Pablo Aristizábal, A. Walker, Federico Botero, N. Ramírez, S. Chiquito & A. Díaz* 4333 (holotype HUA-0046730, sheet with larger inflorescence and leaves, isotype HUA-0046729).

http://www.ipni.org/urn:lsid:ipni.org:names:77338113-1

Subshrub 1.5 – 2.5 m high; stems glabrous, somewhat sulcate. *Leaves* petiolate, lamina 16 – 19 × 4 – 5 cm, oblanceolate, shortly acuminate, tapering at base and slightly decurrent on the petiole, margins with a few cilia, abaxially minutely puberulent, leaves otherwise glabrous, veins 10 – 12 pairs; petioles 0.8 – 1.5 cm, glabrous. *Inflorescence* a terminal spike 7 – 12 cm long; rhachis glabrous, bracts 10 – 11 × 4 – 5 mm, ovate, acute terminating in hair point, red, large ocelli present near base, margin densely hirsute; bracteoles 10 × 1 mm, lanceolate, acute, puberulent; calyx subequally 5-lobed, lobes 16 – 18 × 2 – 3 mm, lanceolate, acuminate, straw-coloured when dry, glabrous, veins prominent; corolla 6 – 6.5 cm long, red, glabrous, tube c. 4 cm long, very gradually curved and widened from c. 1.5 mm to 5 mm at mouth, upper lip 2.4 mm long, deeply bilobed, lobes lanceolate, finely acuminate; lower lip 2.7 cm long, lanceolate, simple, terminating in a fine point; filaments glabrous, anther thecae 6 – 7 × 0.75 mm, linear, sagittate, glabrous; style glabrous, ovary oblong, 2.5 mm long, glabrous. Figs 2 – 3.

RECOGNITION. Distinguished by the presence of large ocelli on the bracts and by the glabrous red corolla with deeply lobed upper lip but with the lateral lobes of the lower lip suppressed.

DISTRIBUTION & CONSERVATION. This species is only certainly known from Cerro Tusa, which is a remarkable conical volcanic mountain at the heart of an ancient sacred site of the Zenufaná indigenous culture now managed by the Caja de Compensación Familiar de Antioquia (COMFAMA) (https://www.comfama.com/cultura-y-ocio/parques/cerro-tusa-la-montana-sagrada/) whose aims for the site include "el cuidado y la conservación del bosque húmedo tropical" — the care and conservation of humid tropical forest. We have no information about the size of the population of this species but it is hoped that its conservation can be secured once COMFAMA is made aware of its existence.

SPECIMENS EXAMINED. Only known from the type collection.

HABITAT. Undergrowth in premontane Andean forest at 1300 m.

ETYMOLOGY. This species is named after the distinctive mountain, Cerro Tusa, where it is found. Map 1.

Justicia *L.*

The genus *Justicia* L., as recognised by Graham (1988) and followed by Scotland & Vollesen (2000), is the

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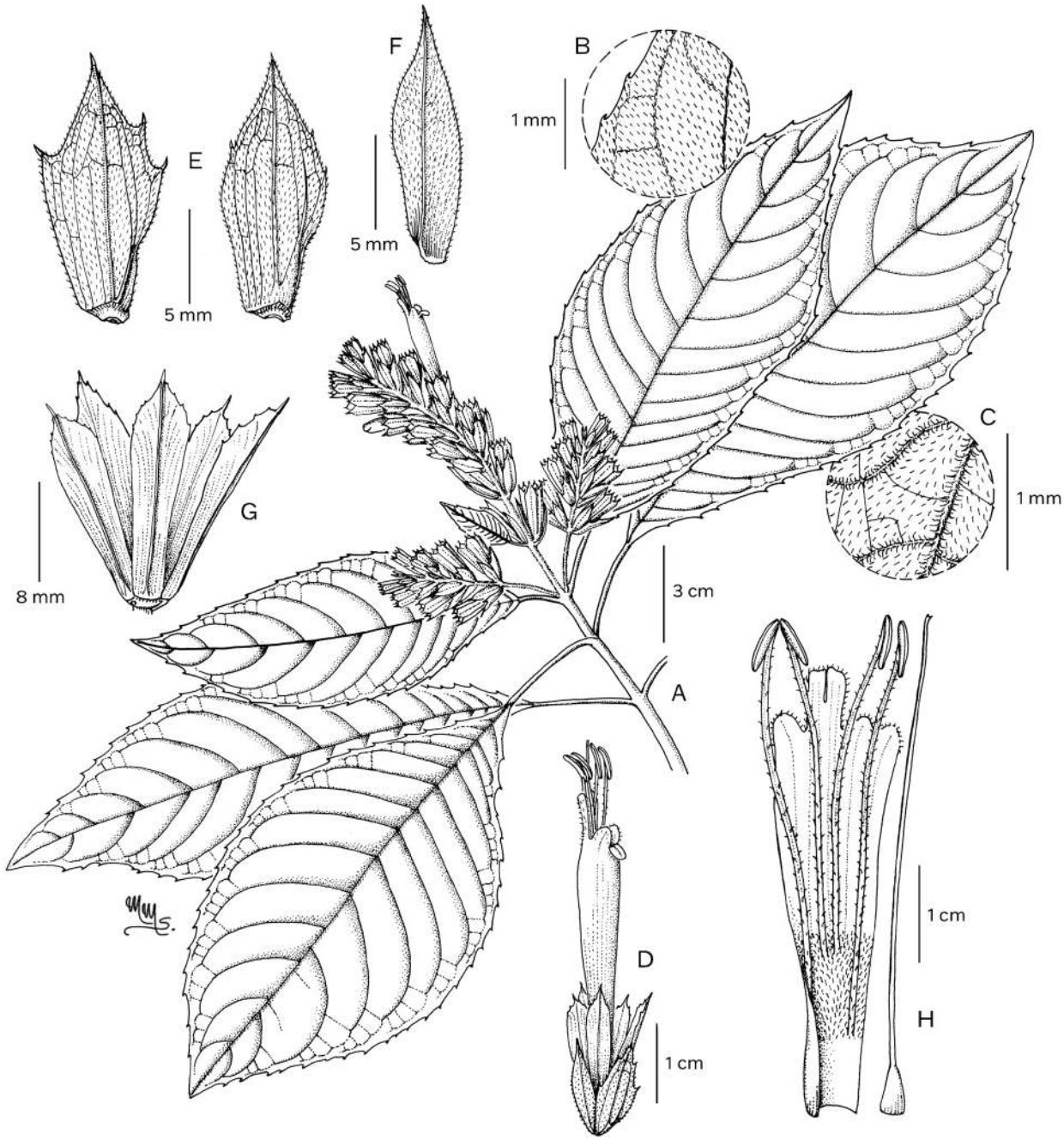

Fig. 1. *Aphelandra guacharorum.* **A** habit; **B** detail of adaxial surface of leaf; **C** detail of abaxial surface of leaf; **D** flower showing bracts, calyx and corolla; **E** bracts; **F** bracteole; **G** calyx; **H** corolla opened out to show stamens and style. **A** – **H** from *Pablo Stevenson et al.* 2840. DRAWN BY MARCELA MORALES.

largest genus in Acanthaceae and readily identified by the bilabiate corolla, 4-seeded capsule and the (usually) bithecous superposed anthers. However it is not monophyletic unless expanded to include other disparate elements, such as *Dicliptera* Juss. (Kiel *et al.* 2017, 2018), so it is likely that it will be circumscribed differently in the future. However, until new generic boundaries are established, we have followed Manzitto-Tripp *et al.* (2022) in treating *Justicia* as circumscribed by Graham. There are approximately 90 species of *Justicia* recognised in Colombia (Bernal *et al.* 2016) before the 11 new species described below and 3 new records are included. Very few species are at all widespread or common and it is difficult to extend the list

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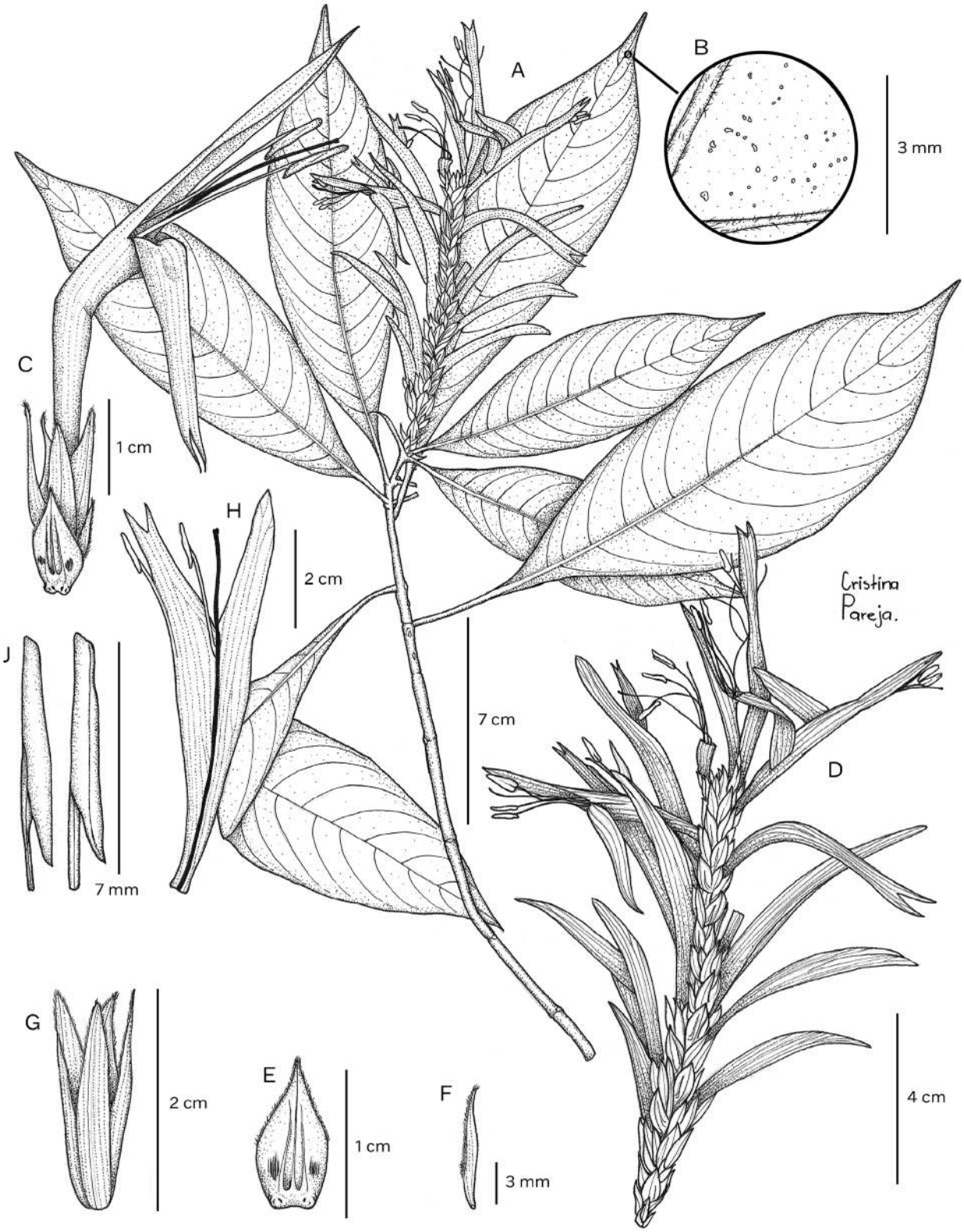

Fig. 2. *Aphelandra montis-tusae* **A** habit; **B** detail of leaf surface; **C** flower; **D** inflorescence; **E** bract; **F** bracteole; **G** calyx; **H** corolla, **J** anthers. **A** – **J** from *S. E. Hoyos-Gómez et al*. 4333. DRAWN BY CRISTINA PAREJA.

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Fig. 3. *Aphelandra montis-tusae, Hoyos-Gómez et al.* 4333. PHOTO: SAÚL E. HOYOS-GÓMEZ.

of common species beyond *J. candelariae* (Oerst.) Leonard, *J. comata* (L.) Lam., *J. filibracteolata* Lindau, *J. pectoralis* Jacq. and *J. secunda* Vahl. All the remaining species are localised in their distribution and are infrequently to very rarely collected. Many are known from a single location or collection. Some appear to be excessively rare. None of the following seven species has been found since the 19th century: *J. jacobinioides* Leonard, *J. littoralis* J.R.I.Wood (*Jacobinia lindaviana* Rusby), *J. novagranatensis* Leonard, *J. hochreutineri* J.F.Macbr. (*Adhatoda lindeniana* Nees), *J. rhodoides* Leonard, *J. sanctae-martae* Lindau (probably = *J. carthaginensis* Jacq. fide Bremekamp (1938: 241) and *J. xanthostachya* Leonard. Additionally, the following 15 species appear only to be known from the type collections: *J. aethes* Leonard; *J. anabasa* Leonard; *J. chrysea* Leonard; *J. cabrerae* Leonard; *J. enarthrocoma* Leonard; *J. graphophylla* Leonard; *J. gutierrezii* Leonard; *J. kirkbridei* Wassh.; *J. malacophylla* Leonard; *J. petraea* Leonard; *J. porphyrocoma* Leonard; *J. sciera* Leonard; *J. sciota* Leonard; *J. scytophylla* Leonard and *J. sterea* Leonard.

There are a number of Colombian species from the Amazon region, which were considered endemic by Leonard but have been found more recently in neighbouring countries. These include *Justicia blackii* Leonard (Peru) *J. chloanantha* Leonard (Ecuador, Peru), *J. ideogenes* Leonard (Ecuador), *J. peliantha* Leonard (Peru), *J. sanchezioides* Leonard (Ecuador, Peru), *J. schulzei* Leonard (Ecuador, Peru), *J. sphaerosperma* Vahl (Brazil, Ecuador, Venezuela). To these might be added *J. hyperdasya* Leonard which may not be distinguishable from *J. obovata* Wassh. & J.R.I.Wood (Bolivia, Brazil. Peru). Some of these range extensions were reported by Wasshausen (2013) in his account of the family for the *Flora of Ecuador*, while others are based on herbarium records. The following are Amazonian species which are now known to be present in Colombia, but were not reported by Leonard (1958), all are relatively widespread except the last: *Justicia calycina* (Nees) V.A.W.Graham (Brazil. Ecuador, Peru, Venezuela), *J. pilosa* (Brazil, Ecuador, Peru), *J. scansilis* (Rizzini) V.A.W.Graham (Brazil, Peru) and *J. zamorensis* Wassh. (Ecuador).

In contrast, the number of Colombian species that extend to Panama and Costa Rica (Correa *et al.* 2004; McDade 2020) consists of only ten species, so less than 10% of those recorded from Colombia, half of these widespread and somewhat weedy. The ten are *Justicia betonica* L., *J. candelariae* (Oerst.) Leonard, *J. carthaginensis* Jacq., *J. colorifera* V.A.W.Graham, *J. comata* (L.) Lam., *J. ephemera* Leonard, *J. pectoralis* Jacq, *J. rothschuhii* (Lindau) Durkee, *J. secunda* Vahl and *J. spicigera* Schltdl. All of these have been known from Colombia for at least 50 years and no new Central American species has been found for a long time. Seven of the ten extend into Ecuador.

Justicia amphibola (*Leonard*) *J.R.I.Wood* (2009: 54).
Jacobinia amphibola Leonard (1958: 655). Type: Colombia, Cauca, valley of Río San José, vic. Moseopán, *J. Cuatrecasas* 23467 (holotype US-00137199, isotypes F, P).

This species requires careful revision and ideally molecular sequencing to confirm its placement in Acanthaceae. As noted by Leonard (1958) the absence of cystoliths and the dentate leaves raise doubts about its current placement. It has been identified as *Habracanthus harlingii* Wassh. in, for example Tropicos (https://www.tropicos.org/), a species subsequently transferred to *Justicia* as *J. harlingii* (Wassh.) Wassh. but the two species do not seem to be related. It is a Colombian endemic retained in *Justicia* until an alternative placement can be demonstrated.

All records we have seen are from Huila, mostly around the ecotourist sites of Finca Meremberg (*Orlando Rangel* 2634 (COL), 2470 (COL); *Stein* 3729 (COL, MO)) and the Cueva de las Guácharos (*P. Stevenson et al.* 3020 (COL) but also near La Plata, *von Sneidern* 2648 (K). Map 1.

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Justicia betancurii *J.R.I. Wood*, **sp. nov.** Type: Colombia. Meta, Mun. Cubarral, Vereda Alto Vergel, bosque cerca Escuela San José a 7 km de Cubarral, 3°59'N 73°46'W, 1000 – 1100 m, 2 Aug. 1995, *Diego León Restrepo & Julio César Betancur* 962 (holotype COAH).

http://www.ipni.org/urn:lsid:ipni.org:names:77338114-1

Branched *shrub*, reaching c. 2 m in height, flowering branches arising from a stout woody stem, stems glabrous, deeply channeled. *Leaves* petiolate, equal in each pair; lamina 9 – 17 × 2.5 – 6 cm, narrowly to broadly oblong-elliptic, apex acuminate, base cuneate, slightly oblique, veins 10 – 15 pairs, dark red, both surfaces glabrous; petioles 0.5 – 1 cm, obscurely bifariously scurfy. *Inflorescence* of lax branched, subglabrous spikes 5 – 15 cm long, arising from the upper leaf axils; primary peduncles 2.5 – 4 cm; secondary peduncles 1.5 – 2.5 cm; bracts at branching points 3.5 × 1 mm, linear-lanceolate; flowers occurring singly on the rhachis 4 – 7 mm apart; rhachis sparsely hirtellous; pedicels 0 – 1 mm, widened upwards; floral bracts 2 – 3 × 0.5 mm, linear-lanceolate, sparsely hirtellous; bracteoles c. 1 × 0.25 mm; calyx 4-lobed, glabrous, lobes 5 × 0.5 mm, filiform; corolla 12 – 15 mm long, tube c. 6 mm long, green, puberulous, 2-lipped, upper lip 4 – 5 mm long, obtuse, entire, lower lip 3-lobed, rugulose, lobes broadly oblong, c. 4 × 2 mm, rounded, pink; filaments glabrous, anthers included, thecae weakly superposed, c. 1 × 0.5 mm, equal, oblong, glabrous, lacking basal appendages; style c. 9 mm long, puberulent, ovary glabrous. *Capsule* 12 – 15 × 3 mm, clavate with a long sterile base, glabrous, 4-seeded; *seeds* c. 2.5 × 2.5 mm, suborbicular, obscurely rugose. Fig. 4.

RECOGNITION. Recalling other species with 4-lobed calyx, such as *Justicia polygonoides* and *J. pleurolarynx* (Blake) Leonard and similar species, but distinct because of the shrubby habit, relatively large leaves 9 – 17 cm long (not < 10 cm long), large corolla 12 – 15 mm long (not 9 – 11 mm), combined with a short calyx c. 5 mm long.

DISTRIBUTION & CONSERVATION. This species is known from only two collections but may easily have been overlooked, particularly as the area where it grows has not been extensively studied. It still harbours a high level of biodiversity but is threatened by increasing economic development including deforestation, mining and the establishment of oil palm plantations (Ramos Velazquez & Suarez 2019).

ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. META: Mun. San Luis de Cubarral, Vereda Aguas Claras, 650 – 700 m, 22 Oct. 1995, *J. L. Fernández-Alonso et al.* 12749 (COL-000209835).

HABITAT. Tropical rainforest in the foothills of the Eastern Cordillera between 650 and 1100 m, south of Villavicencio (Map 1).

ETYMOLOGY. This species is named after Julio César Betancur Betancur, director of the Colombian National Herbarium (COL) and leading Colombian botanist. He was one of the collectors of the type of this collection and of many other specimens cited in this paper.

Justicia chaetocephala (*Mildbr.*) *Leonard* (1958: 531).
Beloperone chaetocephala Mildbr. (Mildbraed 1930: 70). Type: Colombia, Magdalena, La Portada, Santa Marta, *A. Schultze* 679 (holotype B†, photo F0BN-008925).

This species was known to Leonard only from Magdalena Department around the Sierra Nevada de Santa Marta. Recent records extend its range east into César (*J. R. I. Wood* 4670 (COL, FMB, K)) and west to Bolivar (*A. Cogollo Pacheco et al.* 12556 (JAUM)) and to Córdoba. The collection from Córdoba (*I. Leguizamo et al.* 1145 (COL-000209872), km 33 on the Monteria- Planeta Rica road) differs in the strongly apiculate, often suborbicular glabrous leaves, larger, less hirsute floral parts, the bracts 3 – 4 cm long and corolla, c. 5 cm long which is pubescent with gland-tipped hairs. The typical plant, in contrast, has relatively narrower, pubescent leaves that taper to the apex and shorter bracts and corolla. The Córdoba form may merit recognition at some level if further collections confirm these characters are maintained in the wider population. It is illustrated in Fig. 5.

Justicia chloroleuca *J.R.I. Wood*, **sp. nov.** Type: Colombia, Amazonas: Corregimiento de Chorrera, Comunidad de Milán, 1°26'45"S 72°42'14"W, 2017, *D. Cárdenas, D. Marín, J. Manaidego, P. Kuíra & A Kuíra* 51528 (holotype COAH).

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Herb to c. 70 cm in height; stems pubescent with slightly asperous hairs. *Leaves* petiolate, subequal, lamina 6 – 11 × 3.5 – 5.8 cm, oblong-elliptic, acuminate at both ends, paler beneath, both surfaces glabrous except for the pubescent abaxial veins; petioles 0.8 – 2.6 cm, pubescent. *Inflorescence* of pale green spikes 3 – 6 cm long, these terminal and arising from the upper leaf axils; peduncles 0.7 – 1.5 cm, pubescent; bracts 10 – 12 × 5 – 6 mm, somewhat dimorphic in two rows, one row symmetric, one row oblique and asymmetric, obovate-spathulate, shortly apiculate, densely and shortly pubescent with eglandular hairs, the margin ciliate, characteristically light green in colour; bracteoles filiform, 5 – 6 mm long, pubescent; calyx

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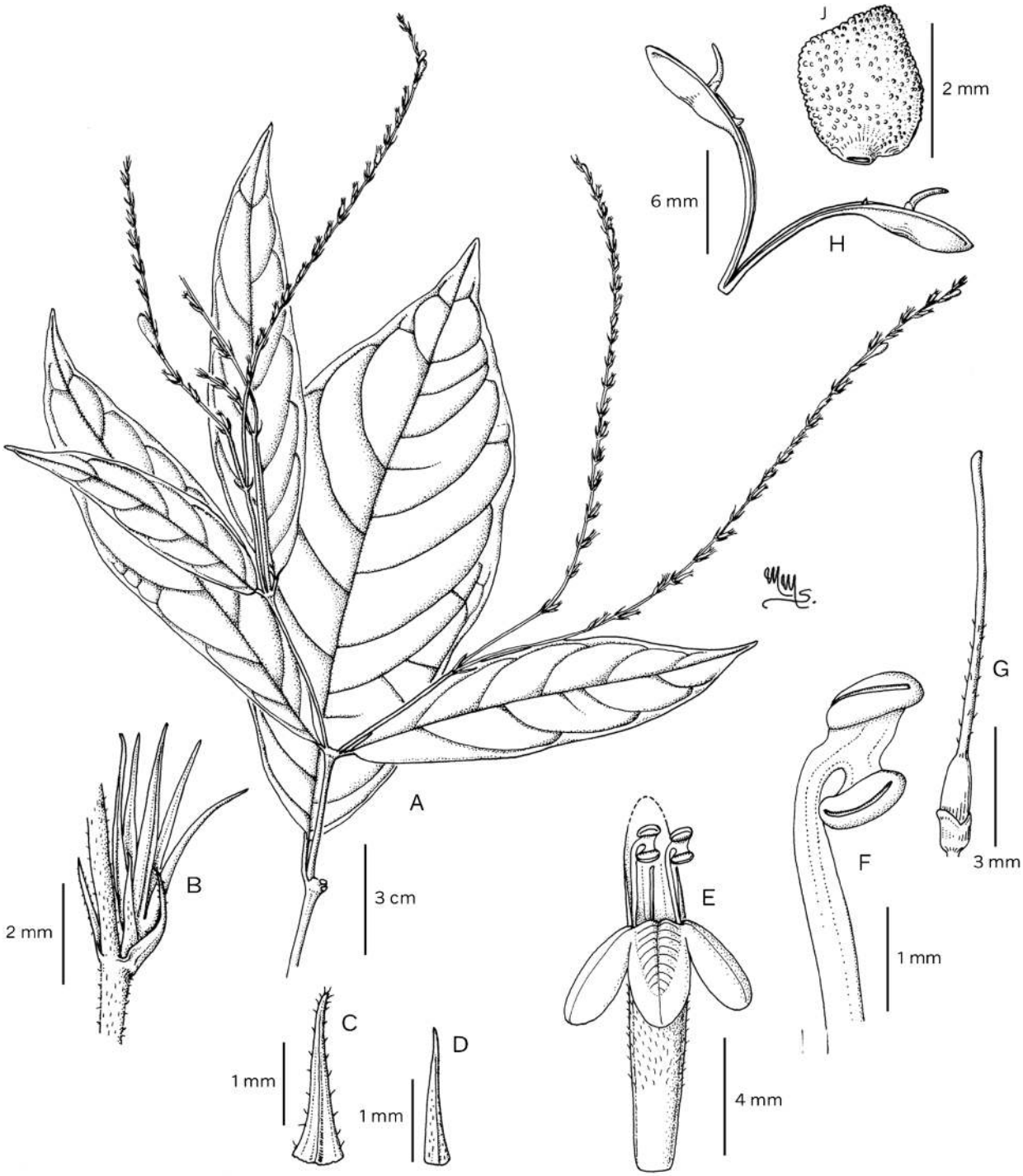

Fig. 4. *Justicia betancurii*. **A** habit; **B** flower showing calyx, bract and bracteole; **C** bract; **D** bracteole; **E** corolla; **F** anther; **G** ovary and style; **H** capsule; **J** seed. **A** – **J** from *Fernández-Alonso et al.* 12749. DRAWN BY MARCELA MORALES.

subequally 5-lobed to base, 5 × 0.5 mm, lobes filiform, shortly pubescent; corolla 13 – 15 mm long, white, glabrous, 2-lipped, upper lip c. 3 mm long, ±triangular, entire; lower lip c. 4 mm long, 3-lobed, the lobes c. 2.5 × 1.5 mm, broadly oblong, rounded; anthers included, the thecae c. 1 × 0.5 mm, broadly oblong, strongly superposed, glabrous, the lower tailed; style c. 10 mm, glabrous, ovary glabrous. *Capsule* 7 × 2.5 mm, clavate, densely but very shortly pubescent, 4-seeded; *seeds* lenticular 1.5 × 1 mm, rugose. Figs 6, 7.

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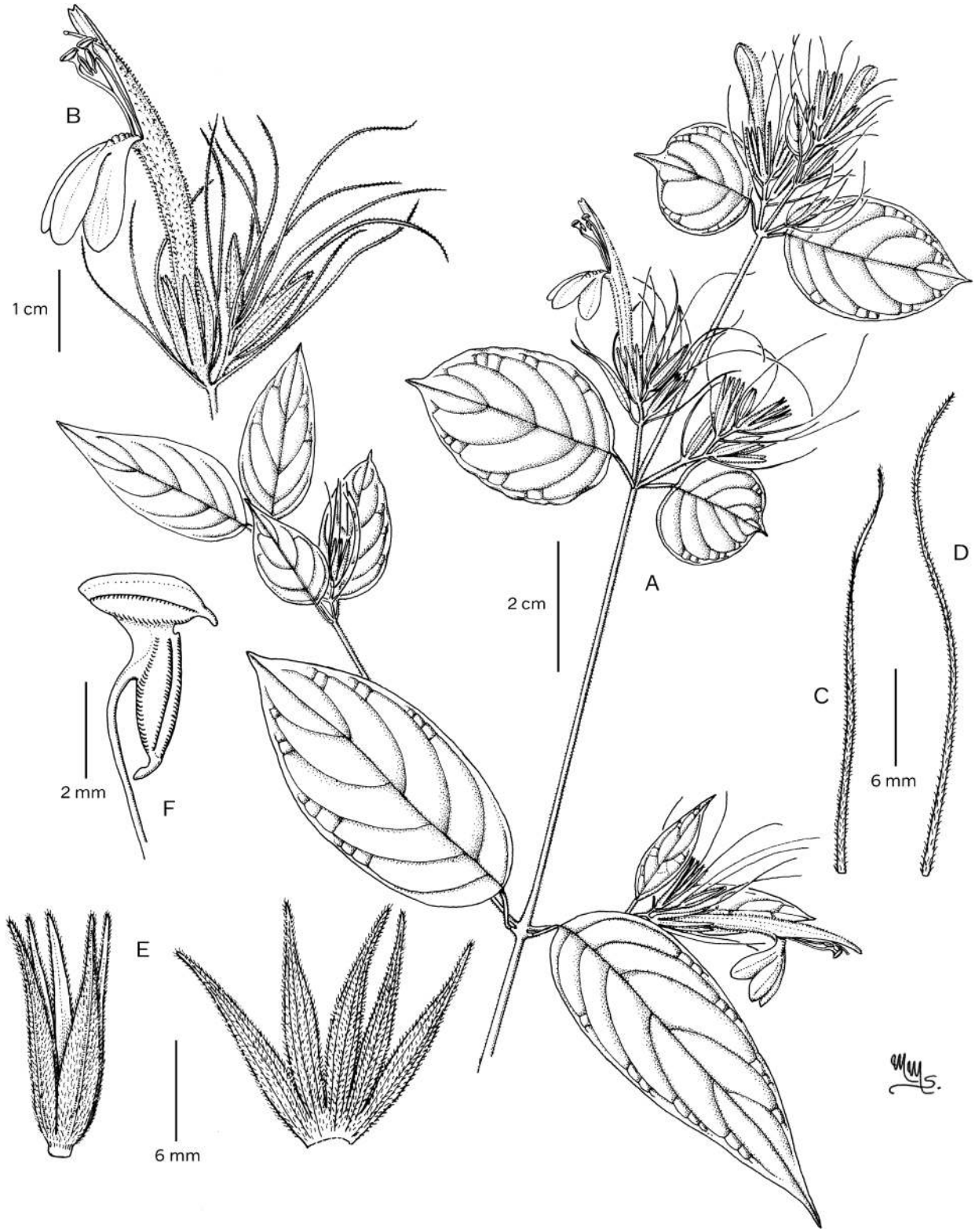

Fig. 5. *Justicia chaetocephala* – form found in Córdoba. **A** habit; **B** inflorescence with corolla; **C** – **D** bract and bracteole; **E** calyx; **F** anther. **A** – **F** from *I. Leguizamo et al*. 1145. DRAWN BY MARCELA MORALES.

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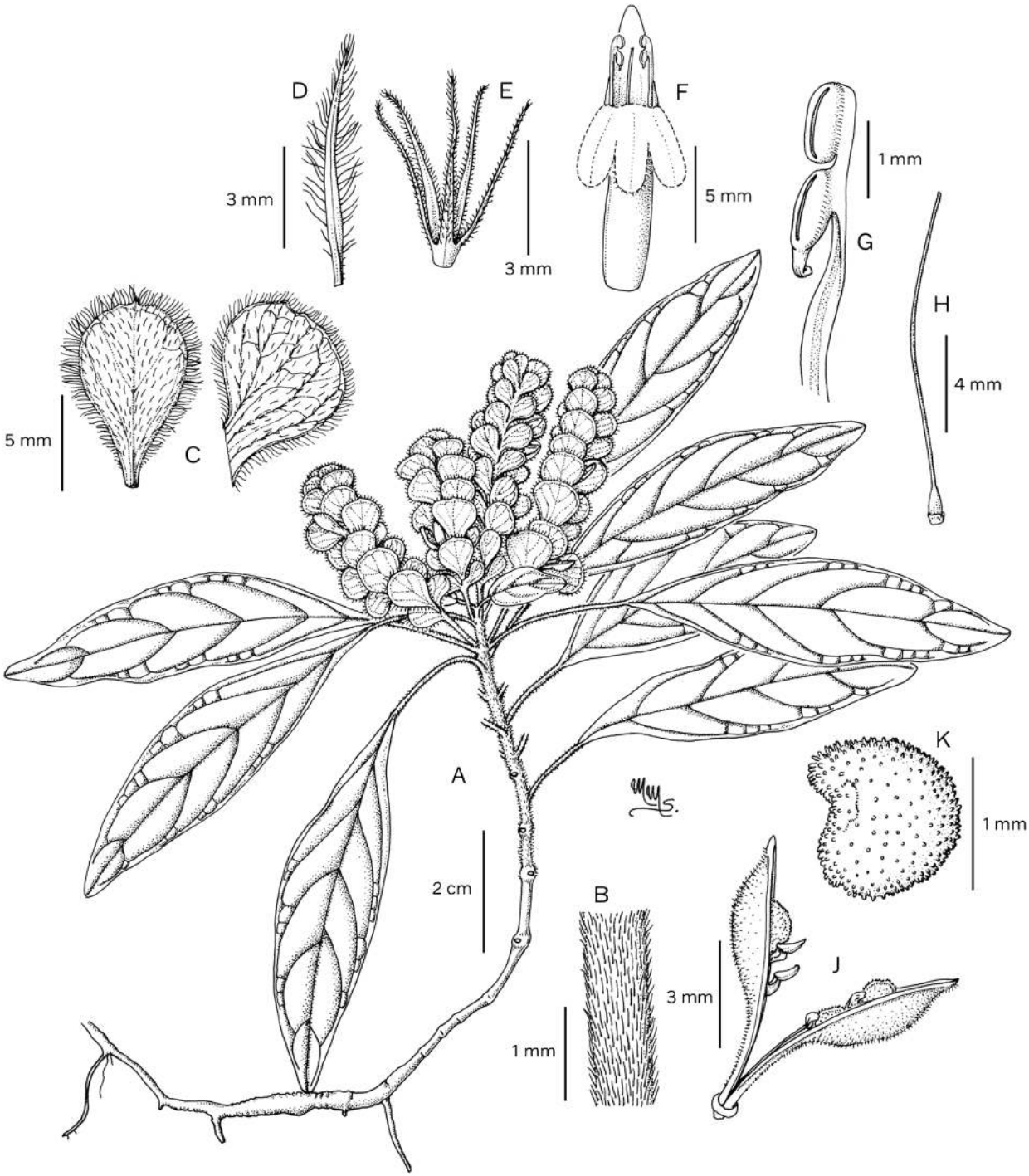

Fig. 6. *Justicia chloroleuca*. **A** habit; **B** detail of stem showing indumentum; **C** bracts, symmetrical (left), asymmetrical (right); **D** bracteole; **E** calyx; **F** corolla; **G** anther; **H** ovary and style; **J** capsule; **K** seed, **A** – **K** from *M. Rodríguez et al*. 3233 (COAH). DRAWN BY MARCELA MORALES.

RECOGNITION. Resembling *Justicia pilosa* (Ruiz ex Nees) Lindau in the shape of its sepals but plant light green in colour (not dark green to brownish), the leaves oblong-elliptic, 2 – 3 times as long as broad (vs ovate-elliptic, < twice as long as broad), bracts obscurely mucronate, uniformly pubescent (vs strongly mucronate), conspicuously ciliate but otherwise subglabrous, calyx lobes filiform, shortly pubescent (vs sparsely ciliate), corolla glabrous (vs puberulent on the exterior).

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Fig. 7. *Justicia chloroleuca,* showing distinctive pale green colouring and inflorescence. *D. Cárdenas et al.* 51528 (COAH). PHOTO: JOHN WOOD.

DISTRIBUTION & CONSERVATION. All records of this species come from two areas in Amazonas: the Araracuara area on the border with Caquetá which lies at approximately 0°36"S 72°23"W (Map 1) and from the Chorrera area approximately 100 km further south. Neither location appears to enjoy any legal protection but the area is remote and the forest extensive and poorly studied so there is no reason to suspect that this species is not more widespread locally or particularly threatened.

ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. AMAZONAS: Río Caquetá, Araracuara, 1 April 1976, *C. Sastre & H. Reichel* 5067 (COL000209925): Río Caquetá, Monochoa, (caserío Huitoto Nipoda), 20 – 30 km de Araracuara, 30 Dec. 1996, *C. Sastre & H. Reichel* 5067 (COL000369140); Corregimiento de Chorrera, Cabildo de Puerto Cordillera, margen derecho del Río Igara-Paraná, 23 Aug. 2017, *D. Cárdenas et al.* 48945 (COAH); Corregimiento de Chorrera, Comunidad Cordillera, Varillal, 1°34'45"S 72°41'56"W, 226 m, 8 Oct. 2017, *M. Rodríguez et al.* 3233 (COAH).

HABITAT. Tropical rainforest on white sands at low altitudes of around 200 m.

ETYMOLOGY. The epithet *chloroleuca* means greenish-white and refers to the distinct colour of this species.

Justicia cristalina *J.R.I. Wood & Hoyos-Gómez*, **sp. nov.** Type: Colombia, Mun. San Carlos, Corregimiento Alto Samaná, Vereda Miraflores, 6°05'N 74°52'W, 880 – 920 m, 25 Oct. 1989, *R. Callejas, F. J. Roldán & J. D. Castaño* 8561 (holotype HUA-0052414).

http://www.ipni.org/urn:lsid:ipni.org:names:77338116-1

Subshrub 0.8 – 3 m high; stem obscurely bifariously scurfy, glabrescent. *Leaves* petiolate, subequal, lamina 7 – 24 × 3.5 – 9.5 cm, broadly oblong-elliptic, apex shortly acuminate, base cuneate, slightly oblique, margin weakly undulate, veins obscurely puberulent when young, soon glabrescent, c. 9 pairs; petioles 1 – 5.3 cm, shortly puberulent when young, glabrescent. *Inflorescence* of short pedunculate bracteate spikes from the upper leaf axils, 3 – 8.5 cm long; peduncles 0.2 – 2.5 cm long, puberulent when young, glabrescent, often with a reduced foliose bract at base; bracts 15 – 20 × 8 – 11 mm, ovate, reddish, acuminate, subglabrous or puberulent on the veins, margin ciliate; bracteoles resembling bracts, slightly falcate; calyx 5-lobed to base, lobes 16 × 2.5 mm. oblong-lanceolate, acuminate, puberulous; corolla pubescent, purple with a white throat, tube 18 × 3 mm, only slightly widened upwards, upper lip 12 – 14 mm, erect, notched; lower lip with white honey guides, deflexed, 11 – 12 mm long, shallowly 3-lobed, the lobes rounded; filaments glabrous, anthers included, thecae superposed, oblong-elliptic, upper 1.5 × 0.5 mm. puberulent, the lower 2.5 × 0.5 mm, tailed, glabrous; ovary glabrous; *capsule* 20 × 5 mm, clavate, glabrous, 4-seeded; *seeds* c. 2.5 mm diam., rugose. Fig. 8.

RECOGNITION. This species can be compared with *Justicia leucerythera* Leonard in the shape and size of the corolla and bracts but the calyx is much larger, 16 – 20 mm long (not 5 mm), the bracteoles resemble small bracts (not lanceolate), the corolla is purple (not pink or red) and the upper anther thecae are puberulent (not glabrous).

DISTRIBUTION & CONSERVATION. This is one of several species endemic to river canyons in the karst limestone region of eastern Antioquia, an area that merits a higher level of conservation than that accorded by the municipality of San Luis concerned about the quality of its water supply.

ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. **Antioquia**: San Luis, Quebrada La Cristalina, 6°N 74°45'W, 550 m, 29 Oct. 1987, *Juan Guillermo Ramírez & D. Cárdenas* 1143 (HUA, JUAM); ibid., 26 June 1987, *Juan Guillermo Ramírez & D. Cárdenas* 1936 (HUA, JUAM); Mun. San Carlos, Corregimiento Alto Samaná, Vereda Miraflores, 820 – 900 m, 15 June 1989, *R. Fonnegra, O. D. Escobar & J. Betancur* 3064 (HUA); Mun. Anorí, Quebrada San Juan, km 15 en la vía al Mun. Campamento, 7°08'N, 72°21'W, 990 m, 20 Nov. 1989, *R. Callejas, O. D. Escobar & D. Castaño* 8871 (HUA).

HABITAT. Tropical rainforest, especially on wooded sides of quebradas between about 550 and 1000 m.

ETYMOLOGY. This species is named after the Quebrada La Cristalina where this species has mostly been found.

Justicia cuatrecasasii *Wassh.* (Wasshausen 1989: 257). Type: Colombia, Vaupés, Mitú and vicinity; along Río Vaupés at Circasia, *J. L Zarruchi* 2101 (holotype US-00433139; isotypes COL, K).

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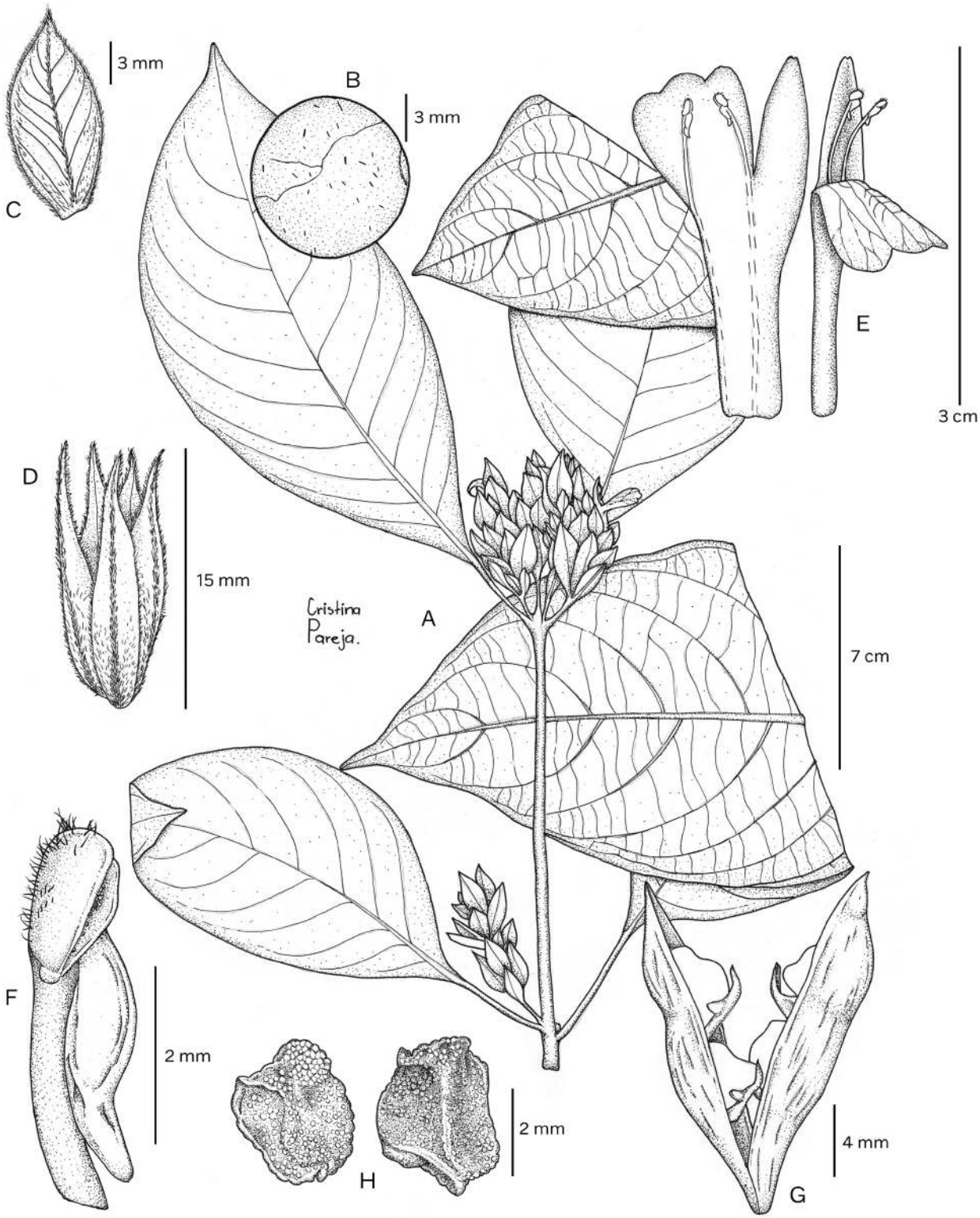

Fig. 8. *Justicia cristalina* **A** habit; **B** detail of adaxial leaf surface; **C** bract; **D** calyx; **E** corolla; **F** anther; **G** capsule; **H** seeds. **A** – **J** from *Juan Guillermo Ramírez & D. Cárdenas* 1143. DRAWN BY CRISTINA PAREJA.

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A very distinct shrubby species, which has white flowers and leaves and bracts golden-brownish abaxially with silky hairs. It was previously only known from the type from Mitú (Map 1) but an additional record (*Franco et al.* 3257 (MO, BM)) from the Serranía de Chiribiquete, Caquetá has been seen.

Justicia daidalea *Leonard* (1958: 521). Type: Colombia, Santander, between Ríos Sogamoso and Colorado, vic. Barrancabermeja, *O. Haught* 1581 (holotype US-00137045; isotypes F, K).

A rather distinctive species with narrowly elliptic leaves with an obtuse to rounded apex and pale area around the midrib. This was previously only known from the type but the following is an additional record from a nearby locality: Barrancabermeja, 6°58'69"N 73°41'88"W, 102 m, *C. Sandoya & Y. D. Ospina* 32 (COL).

Justicia daironcardenasii *J.R.I.Wood & Hoyos-Gómez*, **sp. nov.** Type: Colombia, Antioquia, Mun. San Luis, Vereda La Josefina, autopista Medellín-Bogotá, 800 m, 30 Nov. 1983, *S. Hoyos & J. Hernández* 552 (holotype JAUM-01359).

http://www.ipni.org/urn:lsid:ipni.org:names:77338117-1

Herb 0.5 – 1.2 m, stems sulcate, bifariously hirsute, glabrescent. *Leaves* subequal, petiolate, 11 – 20 × 3.5 – 9 cm, narrowly to broadly elliptic, apex shortly acuminate, sometimes weakly falcate, base cuneate, slightly oblique, veins c. 7 pairs, glabrescent except for persistent pubescence on veins, cystoliths not prominent; petioles 3 – 5 mm, hirtellous. *Inflorescence* of axillary spikes 3 – 7 cm long; peduncles 2 – 3 mm, puberulent; rhachis bifariously pubescent; bracts 7 – 9 × 3 – 5 mm, obovate-spathulate with a distinct petiole 2 – 3 mm long and apiculate apex, sparsely ciliate, the cilia multicellular, pale green; bracteoles 4 – 5 mm long, filiform; calyx subequally 5-lobed, lobes 6 × 0.5 mm, linear-lanceolate, acuminate, minutely ciliolate; corolla 15 – 18 mm long, pubescent, white with lilac flushing, 2-lipped, upper lip notched, lower lip with rounded, obovate lobes 3 – 4 mm long; anthers included, the thecae broadly oblong, c. 1.5 × 0.75 mm, superposed, upper obscurely puberulent, lower glabrous, tailed. *Capsule* 8 – 10 × 3 mm, clavate, pubescent, 4-seeded, *seeds* c. 2.5 × 2.5 mm, rugose, flattened. Fig. 9.

RECOGNITION. This species resembles other species with large, shortly petiolate leaves, flowers in spikes and prominent, spathulate or obovate bracts. It is perhaps closest to *Justicia chaponensis* Leonard but differs in the glabrescent (vs coarsely hirsute) stems and leaves, in the short spikes 3 – 7 cm long (not up to 12 cm long and sometimes exceeding the leaves) and the smaller, more clearly obovate-spathulate bracts 7 – 9 × 3 mm (not elliptic-obovate 8 – 12 × 3 – 4 mm).

DISTRIBUTION. Endemic to the Río Claro area, Antioquia. Map 1.

ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. **Antioquia**: Mun. San Luis, sector Río Samaná-Río Claro, 480 m, 12 Oct. 1981, *J. J. Hernández & S. E. Hoyos* 84 (HUA); ibid., 15 March 1982, 550 m, *J. J. Hernández, S. E. Hoyos & L. Albert* 227 (HUA); ibid., 800 m, 3 Dec. 1982, *J. J. Hernández & S. E. Hoyos* 624 (HUA); ibid., Vereda La Josefina, camino a Tulipán, Caño la Mariola, km 132, 800 m 18 Feb. 1982, *S. Hoyos & J. Hernández* 908 (JAUM); ibid., 1.3 km debajo puente sobre Río Samaná, 6°00'39"N 74°56'15"W, 500 m, June 2011, *P. Q. Trujillo et al.* 6236 (HUA); ibid., Vereda La Garrucha bajo el puente de la autopista Medellín-Bogotá 5°59'20"N 74°56'12"W, 450 m, 27 May 2017, *A. Cogollo et al.* 13245 (JAUM). Mun. Puerto Nare, Vereda Guimaro, Finca Serranías, 6°06'N, 74°48'W, 430 – 800 m, 25 Sept 1990, *D. Cárdenas & J. G. Ramírez* 2976 (JAUM).

HABITAT. Disturbed tropical rainforest at 480 – 800 m altitude.

ETYMOLOGY. This species is named after the Colombian botanist, the late Dairon Cárdenas López, who graduated from the University of Antioquia in 1991 with a thesis on the floristics of the Quebrada Cristalina, where he collected this species. He later focused his studies on the Amazon region, after 1993 working with the Instituto SINCHI of Bogotá and becoming director of the Herbario Amazónico Colombiano (COAH). Many of his collections are cited in this paper. Dairon Cárdenas is renowned for his conservation work as well as his expertise on the Amazon flora and is sadly missed since his early death in 2022.

NOTE. The following two collections at HUA may prove to be conspecific with *Justicia daironcardenasii*, but differ in the densely hirsute stems with brown hairs, the leaves ciliate with similar hairs, the larger leaves up to 25 × 12 cm and bracts strongly ciliate:

COLOMBIA, **Caldas**: Norcasia, Proyecto hidroeléctrico La Miel, zona del embalse, 400 – 600 m, July 1999, *W. G. Vargas* 6158 (HUA); Vda. Moscovita, Quebrada Santa Bárbara 5°34'01.3"N 74°55'03.5"W, 450 m, *M. Correa et al.* 2292 (HUA)

Justicia hochreutineri *J.F.Macbr.* (Macbride 1934: 19).
Adhatoda lindeniana Nees (1847: 405). Type: Colombia, [Nueva Granada], *Linden* 1525 (holotype K-000529379 ex Herb Hook.; isotypes BM-000992620, K ex Herb Benth., P).

Herb, probably perennial, to 50 cm; stem ascending, geniculate, pubescent with curled hairs. *Leaves*

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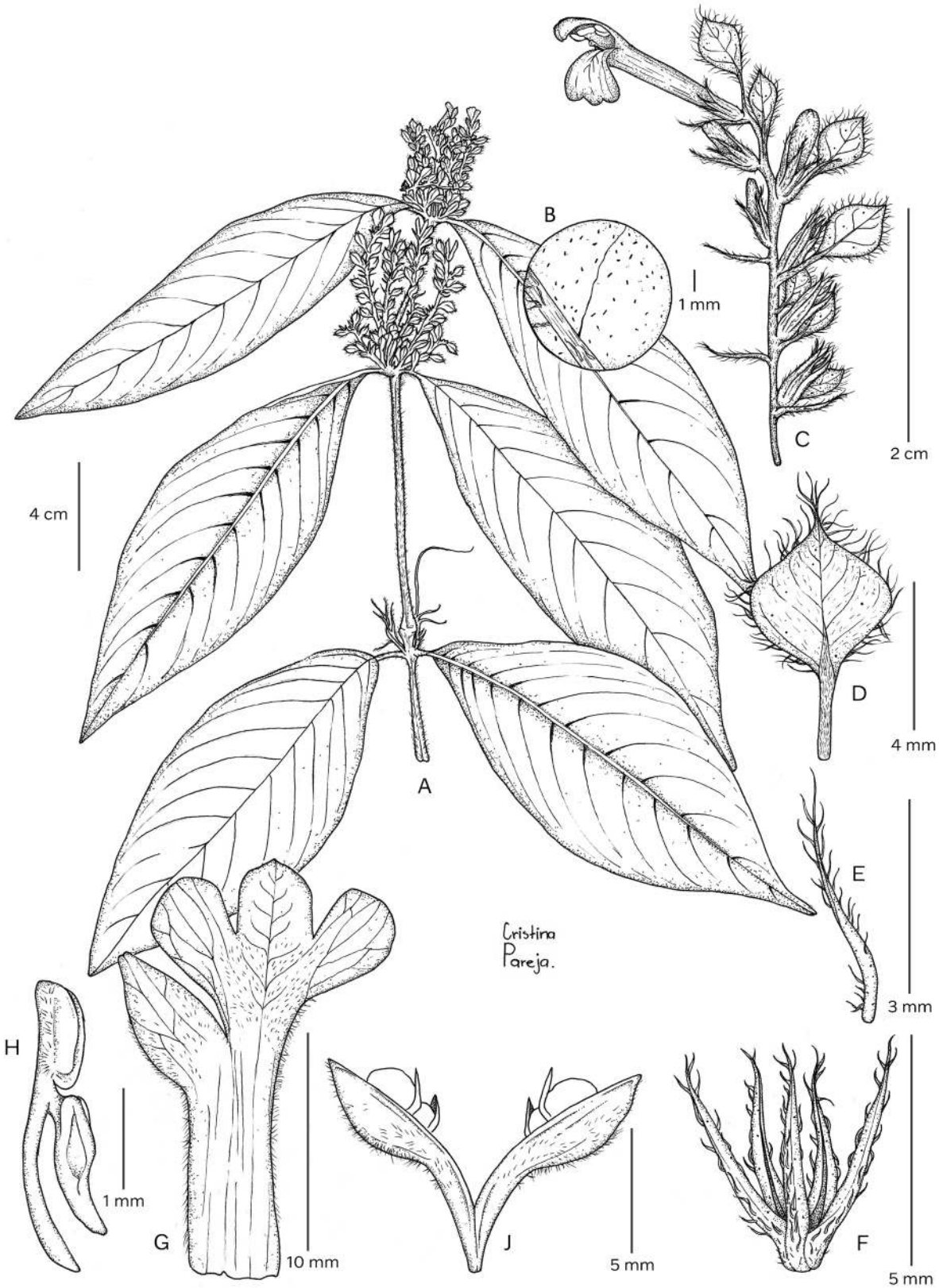

Fig. 9. *Justicia daironcardenasii*. **A** habit; **B** detail of adaxial surface of leaf; **C** inflorescence branch; **D** bract; **E** bracteole; **F** calyx; **G** corolla; **H** anther; **J** capsule. **A** – **H** from *Hoyos & Hernández* 552. DRAWN BY CRISTINA PAREJA.

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petiolate, lamina 4.5 – 9 × 2 – 4 cm, ovate, apex acuminate, base cuneate to rounded, adaxially with abundant cystoliths, veins 5 – 6 pairs, hirtellous, petioles 0.3 – 2.2 cm, hirtellous. *Inflorescence* of shortly pedunculate, dense, few-flowered axillary and terminal spikes c. 2 cm long; peduncles 0.2 – 0.5 cm; rhachis hirtellous; bracts c. 12 – 20 × 3 – 6 mm, obovate, narrowed into a petiolar base, ciliolate; bracteoles 9 – 10 × 2.5 mm, oblanceolate, ciliolate; calyx 5-lobed to base, lobes 11 – 12 × 1.5 – 2 mm, oblong-lanceolate, acuminate to a fine point, pubescent and ciliolate; corolla 3 – 4 cm long, gaping with reticulate palate, probably pink or white (but colour not recorded), upper lip c. 15 × 10 mm, entire, broadly oblong, hooded, lower lip strongly rugulose, 3-lobed, lobes broadly oblong, rounded, c. 10 × 5 mm; filaments glabrous, anther thecae 1.5 × 1 mm, oblong-elliptic, pubescent, weakly superposed, lower anther tailed; style thinly pilose. Capsule 12 – 13 × 4.5 mm, clavate, pubescent; seeds not seen. Fig. 10.

DISTRIBUTION & CONSERVATION. Although *Linden* 1525, is labelled 'Nueva Granada' it is not certain if it was collected within the boundaries of present-day Colombia. Whichever side of today's border it was found, it was presumably collected somewhere in the Serranía de Perijá, although the only other confirmed location (Tovar) is a good deal further east in Venezuela. This species may be extinct but there remains every possibility that it survives in the poorly collected Serranía de Perijá, even though it has not been collected for more than 150 years.

SPECIMENS EXAMINED. COLOMBIA. The type only. **VENEZUELA**. Tovar, 1856 – 1857, *Fendler* 2037 (K).

HABITAT. Not known.

ETYMOLOGY. The name (and species) *Justicia hochreutineri* has been neglected in the literature and is not listed in Tropicos, nor in the works by Leonard (1958), Hokche *et al.* (2008) or Bernal *et al.* (2016). The name is rather inappropriate as the Swiss botanist Bénédict Hochreutiner, after which it is named, never collected in South America or studied South American Acanthaceae.

NOTE. K-000529378 ex Herb. Bentham is correctly labelled *Adhatoda lindeniana* in Bentham's handwriting whereas the holotype K-000529379 (ex Herb. Hooker) is labelled *Tyloglossa lindeniana* in Nees' handwriting, presumably indicating that Nees changed his mind about the generic placement between seeing the specimen and publishing the new species.

Justicia homoea *Leonard* (1958: 575). Type: Colombia, Antioquia, in wet forest southeast of Chigorodó, 40 km S of Turbo, *Oscar Haught* 4565 (holotype US00137098; isotype COL000004506).

The illustration in Leonard (1958: 576) gives a misleading impression of the appearance of this species when compared with the type on Jstor (https://plants.jstor.org/) or *A. C. Estupiñan et al.* 322 (COL) shown in Fig. 11.

This species is now known from Parque Nacional Natural Paramillo on the borders between Antioquia and Córdoba (*A. C. Estupiñan et al.* 322 (COL)) (Map 1) as well as from four additional collections from northern Antioquia, three more from Mun. Chigorodó, near the type locality (*J. M. Posada Herrera et al.* 1072 (HUA); *D. A. Zapata et al.* 1604 (JAUM), *D. A. Zapata et al.* 1608 (JAUM)) and one from Mun. Carepa (*J. Zarucchi et al.* 4991 (HUA)).

Justicia hygrobia *Leonard* (1958: 644). Type: Colombia, Putumayo, Puerto Ospina, *J. Cuatrecasas* 10848 (holotype US).

Previously known with certainty only from the type, the following is an additional record from the Putumayo: *C. Marín, D. Cárdenas & S. Suárez* 2190 (COAH, COL) from Mun. Puerto Leguizamo, Km 19 Vía La Tagua, 0°9'20"S 74°46'40"W 300 m. Map 1.

Records in Tropicos (https://www.tropicos.org) from Ecuador and the Colombian Chocó are almost certainly misidentifications.

Justicia hyperdasya *Leonard* (1958: 543). Type: Colombia, Vaupés, Río Guayabero, *J. Cuatrecasas* 7536 (holotype COL0000045077).

Justicia pampolystachys Leonard (1958: 541). Type: Colombia, Putumayo, Umbría, *G. Klug* 1724 (holotype US00137133, isotypes BM, K, MICH, NY, S), **synon. nov.**

Leonard noted that "*Justicia hyperdasya* is closely related to *Justicia pampolystachys*… differing principally in its herbaceous nature, the white flowers and the oblong or oblong-ovate leaf blades". The leaf shape and habit, however, appear identical and the corolla colour is unlikely to be a significant difference so we propose treating *J. pampolystachys* as a synonym of *J. hyperdasya*.

Oddly we have seen no additional specimens from either Vaupés or Putumayo but quite a few from Caquetá (*D. Cárdenas et al.* 41534 (COAH), 42030 (COAH), 42366 (COAH), *C. Marín et al.* 2591 (COAH), Guaviare (*D. Cárdenas et al.* 21404 (COAH), *A. López & N. Rodríguez* 4383 (COAH), *W. Castaño et al.* 3784 (COAH), *H. Mendoza et al.* 18261 (COAH), *H. Mendoza et al.* 18261 (COAH), *R. Lopez & D. Giraldo-Cañas* 1086, *J. Betancur et al.* 18830 (COAH, HUA), *Marulanda et al.* 1558 (HUA) and one from Meta (*J. M. Idrobo* 2014 (COL) from Caños Negros, near Villavicencio).

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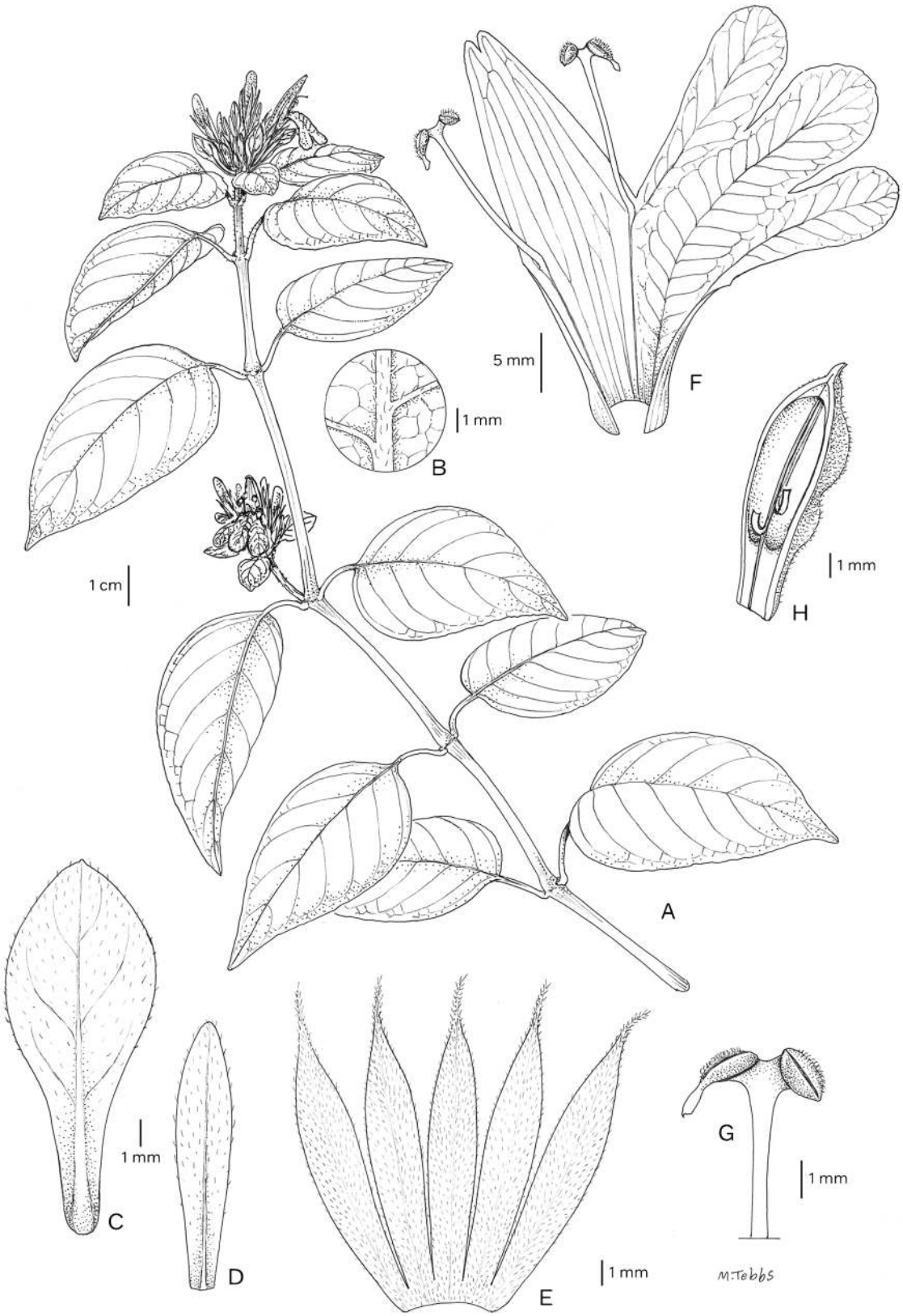

Fig. 10. *Justicia hochreutineri*. **A** habit; **B** detail of adaxial leaf surface showing indumentum; **C** bract; **D** bracteole; **E** calyx; **F** corolla opened out to show stamens; **G** anther; **H** valve of capsule. **A** – **H** from *Linden* 1525. DRAWN BY MARGARET TEBBS.

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Fig. 11. *Justicia homoea,* showing distinctive inflorescence. *A. C. Estupiñan et al.* 322. PHOTO: JOHN WOOD.

NOTE. This species is close to and may be conspecific with *Justicia obovata* from the south west Amazon basin in Peru, Bolivia and Brazil.

Justicia ipanorensis *J.R.I.Wood*, **sp. nov.** Type: Colombia/Brazil border, near [I]panuré, Río Vaupés, Oct. 1852 – Jan. 1853, *R. Spruce* 2652 (holotype K-001562395 ex Herb. Benth.; isotypes K-001562396 ex Herb. Hook., MO).

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Erect, nearly isophyllous, sparingly branched *perennial* to 50 cm from a branched fibrous rootstock, stems bifariously hirtellous. *Leaves* shortly petiolate, 6 – 11 × 0.8 – 1.8 cm, oblong-lanceolate, apex finely acuminate, base cuneate to attenuate, margin with scattered cilia, both surfaces hirtellous on veins; petioles 3 – 8 mm, hirsute. *Inflorescence* terminal composed of short, relatively stout spikes 1 – 2.5 cm long arising from the uppermost leaf axils; flowers imbricate; bracts 7 – 9 × 5 – 6 mm, obovate-elliptic, mucronate, minutely denticulate, ciliate; bracteoles 5 – 7 × 0.5 mm, linear-lanceolate; calyx subequally 5-lobed, lobes linear 3 × 0.5 mm, densely hirsute apically; corolla c. 10 – 13 mm long, 2-lipped, upper lip erect, notched, 5 mm long, lower lip 6 – 7 mm long, 3-lobed, the lobes obovate, rounded, c. 1.5 mm long and wide, the central lobe slightly broader; filaments glabrous, anthers included, the thecae oblong, c. 1 × 0.25 mm, strongly superposed, glabrous, the lower tailed. *Capsule* clavate, 7 – 8 × 2 mm, densely pubescent, 4-seeded. Fig. 12.

RECOGNITION. A clearly rheophytic species with the characteristic branched fibrous rootstock, oblong-lanceolate leaves, and congested terminal inflorescence, differing from similar species, such as *Justicia rheophytica* described below, by the larger bracts, 7 – 9 × 5 – 6 mm (not c. 3.5 × 2 mm) and corolla, 10 – 13 mm long (not 8 – 10 mm) as well as the densely pubescent (not glabrous) capsule.
DISTRIBUTION & CONSERVATION. This species has not been recollected in Colombia or Brazil for more than 170 years so it may be extinct, but it seems more likely that it has been overlooked.
HABITAT. By inference from its habit, a species of riverside rocks in a region of tropical rainforest.
ETYMOLOGY. This species is named after the type locality, [I]panuré on the Río Vaupés.
NOTE. Although this plant was listed by Lindau (1897b: 681) as *Amphiscopia* sp., it was never described. It was collected by Richard Spruce somewhere along the Río Vaupés (Map 1) near the frontier between Colombia and Brazil. The river forms the border for part of its length and it is not clear in which country Spruce's collection was made. The plant is clearly a rheophyte and suitable habitats are shown in an interesting blog by Sergio Uribe Medina in 2016 about the Comunidad de Araracuara de Vaupés (http://culturatucanodelvaupes.blogspot.com), which must lie somewhere near the type location. The "Cachivera de Ipanoré" referred to in this blog and elsewhere refers to a waterfall, precisely the sort of location where a rheophyte might be found.

Justicia leptochlamys *Leonard* (1958: 551). Type: Colombia, Bolívar, Río Esmeraldas. Between Las Dantas and Puerto Canoa, *F. W. Pennell* 4529 (holotype NY).

The type (*Pennell* 4529) appears to be missing from NY and the only isotype material appears to be a fragment at the Smithsonian Institution (US). No further records are known from Bolívar and all subsequent records (Wood 1988: 46) are from the Pacific coast of the Chocó. As the two locations are very distant, it would be reassuring to see specimens from Bolívar or intermediate locations. In the meantime, we have seen another record from the Pacific coast, *A. Gómez et al.* 336 (HUA, JUAM, MO) from Playa Arenas Blancas 5°03'N 77°02'W in the Chocó.

Justicia lutescens *J.R.I.Wood & Hoyos-Gómez*, **sp. nov.** Type: Colombia, Antioquia, Mun. Frontino, Corregimiento Carauta, Vereda el Guayabo, 1886 m, 6°40'52.6"N 76°13'00.1"W, *W. A. Cogollo, V. Sánchez, M. Guerra, S. Arango, & C. Brand* 13543 (holotype JAUM-084632, sheet with larger inflorescence; isotype JAUM).

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Scrambling ("voluble") *shrub* to 2 m; stems quadrangular, obscurely bifariously yellowish scurfy, glabrescent. *Leaves* petiolate, subequal, lamina 12 – 25 × 5 – 11 cm, obovate to broadly oblong-elliptic, apex acute

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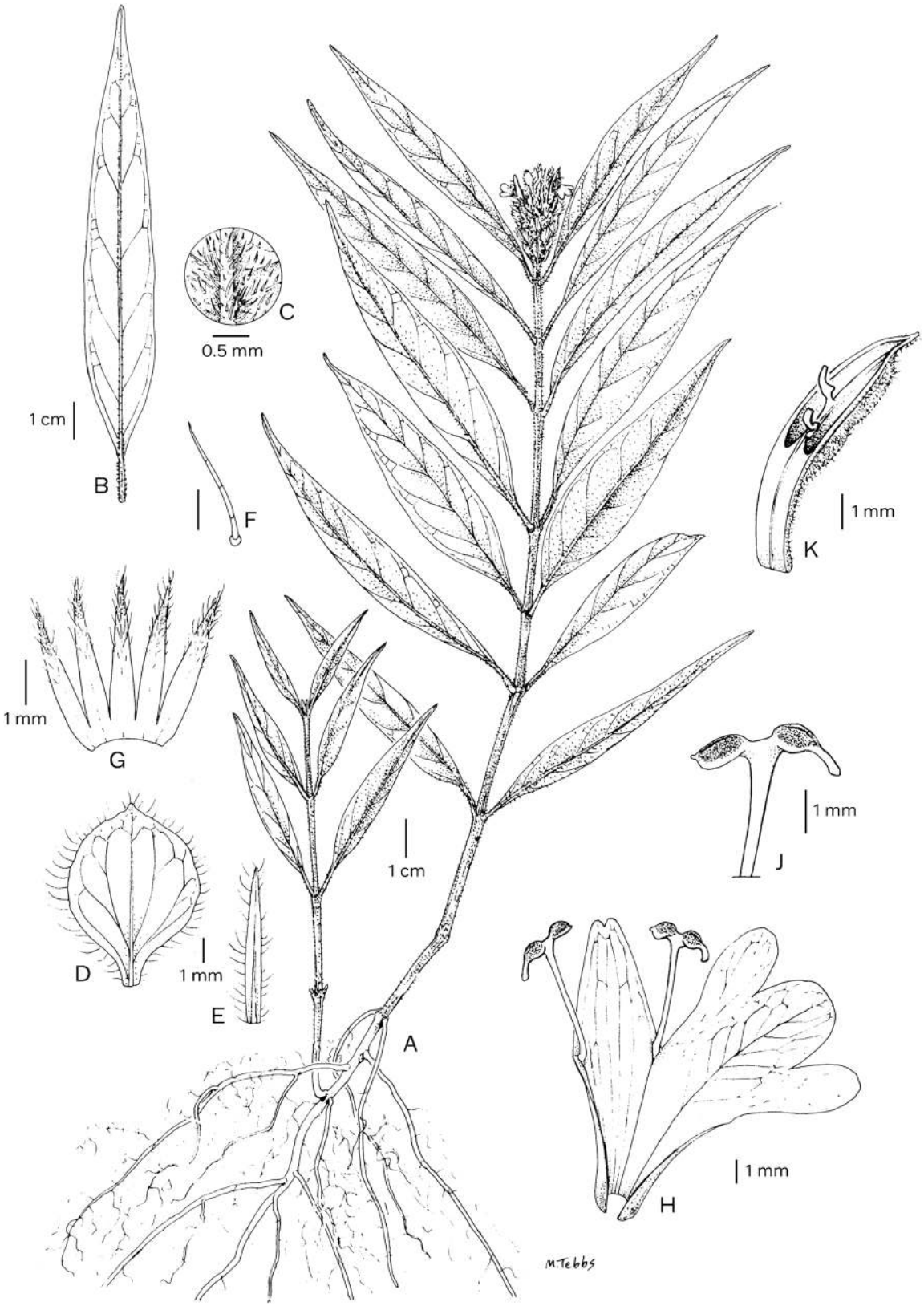

Fig. 12. *Justicia ipanorensis*. **A** habit; **B** leaf; **C** detail of adaxial leaf surface showing indumentum; **D** bract; **E** bracteole; **F** trichome from calyx; **G** calyx; **H** corolla opened out to show stamens; **J** anther; **K** valve of capsule. **A** – **K** from *R. Spruce* 2652. DRAWN BY MARGARET TEBBS.

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to shortly acuminate, base cuneate, both surfaces glabrous and somewhat shiny, paler beneath with prominent venation, veins 10 – 12 pairs, cystoliths present but inconspicuous; petioles 0.6 – 1 cm. *Inflorescence* of paired terminal thyrses, these cymosely structured 12 – 15 × 5 – 10 cm, yellow in colour and densely pubescent with yellowish hairs; peduncle 1.6 – 3 cm, less conspicuously yellow, inflorescence branches yellow, pubescent; bracts 5 × 1 mm, lanceolate, pubescent; bracteoles 4 × 0.5 mm, linear, pubescent; calyx 5-lobed, the lobes 14 – 15 × 1.25 mm, linear-lanceolate, pubescent; corolla 4.1 – 4.3 cm long, creamy-yellow, pubescent, tube c. 22 mm long, gradually widened from 1.5 mm at base to 3 mm at mouth, upper lip c. 17 mm, notched, lower lip c. 18 mm long, 3-lobed, the lobes c. 3 mm long, rounded; filaments glabrous, anthers included, the thecae 2.5 – 3 × 0.75 mm, linear, parallel, superposed, glabrous, basal appendages absent; ovary pubescent. *Capsule* and *seeds* not seen. Figs 13 – 14.

RECOGNITION. This species resembles *Justicia sanchezioides* in habit and inflorescence form but is immediately distinguished by the pale yellow flowers and yellow pubescence that covers all parts of the inflorescence.

DISTRIBUTION & CONSERVATION. Endemic to the Andes in Antioquia and only known from Mun. Frontino in Antioquia (Map 1). No details are known about the size of the population nor of any threats. The area where it grows is apparently not protected.

SPECIMENS EXAMINED. Only known from the type.

HABITAT. Andean forest at 1886 m.

ETYMOLOGY. The epithet *lutescens* refers to the yellow colour of the inflorescence and indumentum.

NOTE. This species resembles a yellow version of *Justicia sanchezioides* Leonard. The corolla and all inflorescence parts are pubescent and conspicuously yellow in colour. Both the corolla and ovary (and so presumably the capsule) are densely pubescent with yellow hairs.

Justicia macuirensis *J.R.I.Wood*, **sp. nov.** Type: Colombia, La Guajira, Serranía de Macuira, Palua [peak], 600 – 800 m, 20 July 1977, *H. Bernal & A. Sugden* 52 (holotype COL-000209857).

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Perennial herb, stem procumbent, woody, glabrous, rooting at the nodes, from which arise erect or ascending herbaceous flowering shoots up to 30 cm in height, densely bifariously hirsute. *Leaves* very shortly petiolate, equal, lamina 2 – 4.5 × 1.5 – 3 cm, ovate-elliptic, apex abruptly acute or shortly apiculate, base rounded and briefly decurrent on the petiole, both surfaces glabrous except for the pubescent central vein; adaxially dark green, abaxially whitish; petioles, 2 – 5 mm, thinly pubescent. *Inflorescence* of simple spikes 4 – 12.5 cm long, these usually solitary and terminal but sometimes with a second spike arising from an upper leaf axil; flowers in opposite pairs, c. 0.5 cm apart; rhachis densely pubescent; bracts 5 – 6 × 0.5 mm, linear, pilose; bracteoles 2.5 – 4 × 0.25 mm, linear; calyx subequally 4-lobed, lobes 5 – 8 × 0.5 mm, linear-lanceolate, acuminate, pilose; corolla 10 – 11 mm long, pubescent, pale purple, tube c. 5 mm, upper lip erect, entire, hooded, c. 3 mm long, lower lip 5 – 6 mm long, rugulose, spreading, 3-lobed, the lobes broadly oblong, rounded; filaments glabrous, anthers included, thecae 1 × 0.5 mm, oblong-elliptic, glabrous, superposed, lacking basal appendages; ovary glabrous, style 8 – 9 mm, glabrous. *Capsule* 7 × 2 mm, clavate, glabrous, 4-seeded; *seeds* not seen. Fig. 15.

RECOGNITION. This is a species with a 4-lobed calyx, small leaves < 4 cm long and small corolla 10 – 11 mm long. It clearly resembles *J. polygonoides* Kunth, *J. pleurolarynx* (Blake) Leonard and similar species, but is distinct by the hirsute stems, subsessile, ovate, strongly discolorous leaves. It is perhaps most comparable to *Justicia pleurolarynx* both geographically and morphologically but can be distinguished by the more hirsute stem, the denser, hirsute inflorescence and especially by the subsessile, more rounded, strongly discolorous leaves. It also has a certain superficial resemblance to *Justicia effusa* D.N.Gibson (*Beleperone steyermarkii* Leonard) from Venezuela and *J. daidalea* from Barrancabermeja but these species differ in their 5-lobed calyx, leaves green abaxially, pubescent corolla and other characters.

DISTRIBUTION & CONSERVATION. Endemic to the Serranía de Macuira in La Guajira, where it is reported to be very abundant (*Saravia & Saravia* 3570) or frequent (*Bernal & Sugden* 52), although these comments presumably refer to the localised cloud forest on the peaks in the serranía. Although the whole serranía is protected as a national park, there has been no record for almost fifty years, and it is not yet possible to confirm the size of the population. The site may be vulnerable to climate change as it is home to a unique, moist microclimate in a desert environment.

ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. LA GUAJIRA: Serranía de Macuira, Bosque de Gusaira, 1800 – 2200 ft, 11 – 12 April 1964, *C. Saravia & M. E. de Saravia* 3570 (COL-000209922); on a dry sheltered slope, [Finca] Uincua, 650 m, 20 April, 1977, *A. Sugden* 293 (COL-000209937, FHO-00076625).

HABITAT. Humid cloud forest between 600 and 864 m. A detailed description of this isolated cloud forest is provided by Sugden (1982).

ETYMOLOGY. This species is named after the Serrania de Macuira.

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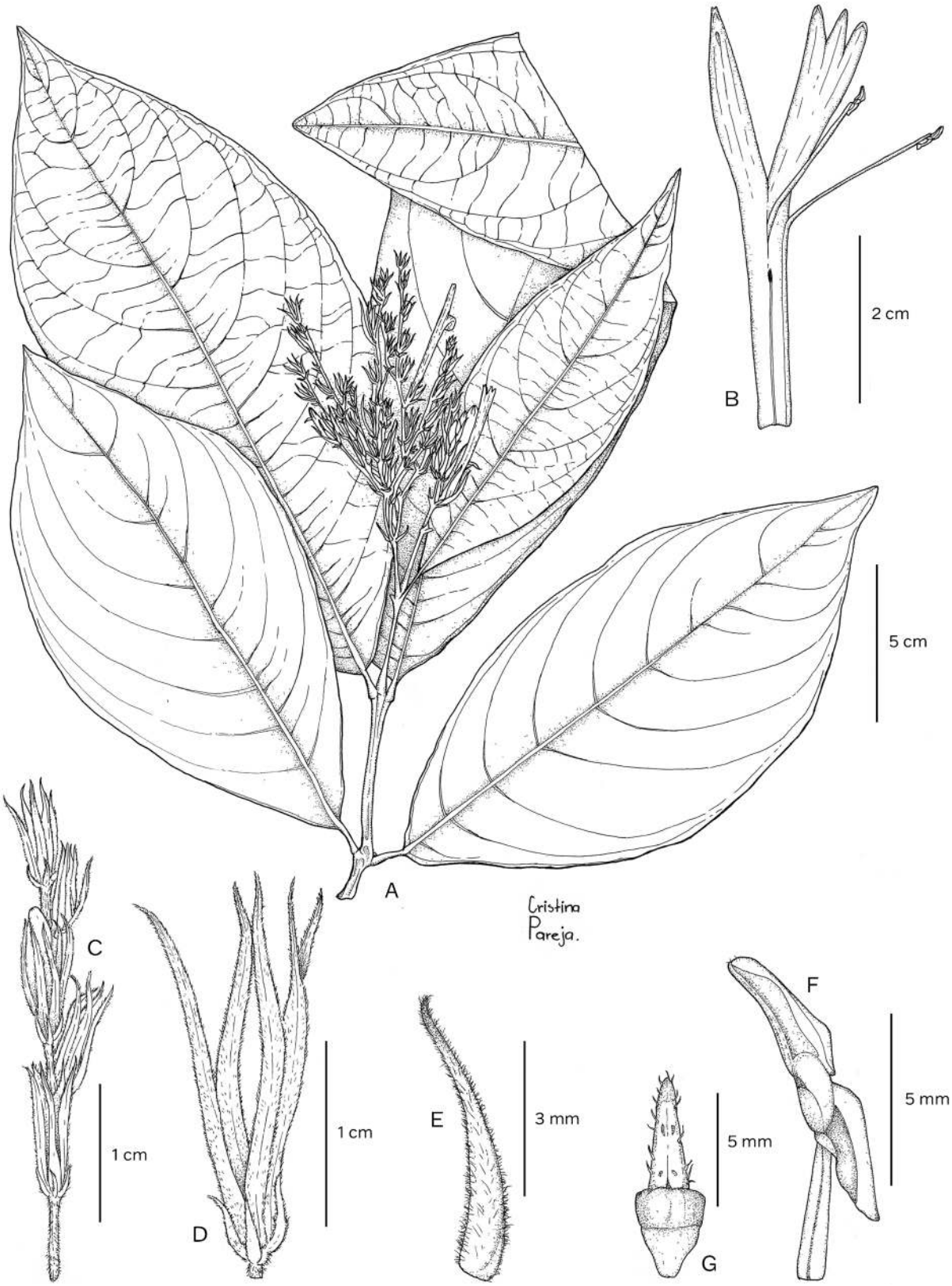

Fig. 13. *Justicia lutescens*. **A** habit; **B** corolla opened to show stamens; **C** inflorescence branch; **D** calyx with bracts and bracteoles; **E** bracteole; **F** anther; **G** ovary. **A** – **G** from *A. Cogollo et al*. 13543. DRAWN BY CRISTINA PAREJA.

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Fig. 14. *Justicia lutescens,* showing distinctive yellow colouring of corolla and indumentum. PHOTO: A. COGOLLO.

NOTE. Wikipedia (https://en.wikipedia.org/wiki/Serranía_de_Macuira) describes the mountain range with these words. "The Serranía de Macuira stands in the middle of the La Guajira Desert at 864 m (2,835 ft), isolated from the Sierra Nevada de Santa Marta and the eastern ranges of the Colombian Andes. The range is a protected area as the National Natural Park Macuira. It is home to numerous species of fauna and flora and due to its relatively high humidity caused by the trade winds and its proximity to the Caribbean sea it presents a forest of dwarf evergreen trees and cloud forests." Since this cloud forest is found between 550 and 864 m, it is unique, occurring far lower than cloud forest elsewhere in Colombia. It is rich in epiphytes. The serranía constitutes an inselberg, isolated from the surrounding desert (Inderena 1984).

Justicia namatophila *Leonard* (1958: 618). Type: Colombia, Caldas, Quebrada Pontoná, 18 km W of La Dorada, 400 m, *O. Haught* 2135 (holotype US 00137128).

This is another rheophyte essentially restricted to a limited area of Antioquia and nearby Rio Pontoná, west of La Dorada in Caldas. We have seen the following collections, all of which come from Antioquia: Mun. San Carlos, Río Guatipa, *L. G. Henao* 217 (COL); Mun. San Rafael, *C. I. Orozco et al.* (COL); Mun. San Luis, Quebrada La Cristalina 6°0'N 74°45'W, *L. G. Ramírez & D. Cárdenas* 625 (HUA, JAUM), ibid., *L. G. Ramírez & D. Cárdenas* 1326 (JUAM); Mun. San Luis, Río Samaná, 6°12'22"N 74°45'36"W, *A. Cogollo et al.* 13358 (JAUM); Mun. San Luis, Cañón del Río Claro, 5°53'N 74°39'W, *A. Cogollo & R. Moreno* 1169 (HUA, JAUM); ibid., *L. McDade & B. Stein* 995 (JAUM). Map 1.

Justicia pelianthia *Leonard* (1958: 591). Type: Colombia, Putumayo, between Quebrada de la Hormiga and San Antonio del Guamués. *J. Cuatrecasas* 11157 (holotype US00137141; isotypes COL, F).

Previously only known from the type. This species is now known from Peru and the following additional collections from Colombia:
COLOMBIA. Cauca: Mun. Santa Rosa, Vereda Diamante, 1°14'N 76°36'W, 1050 – 1150 m, *B. R. Ramírez*

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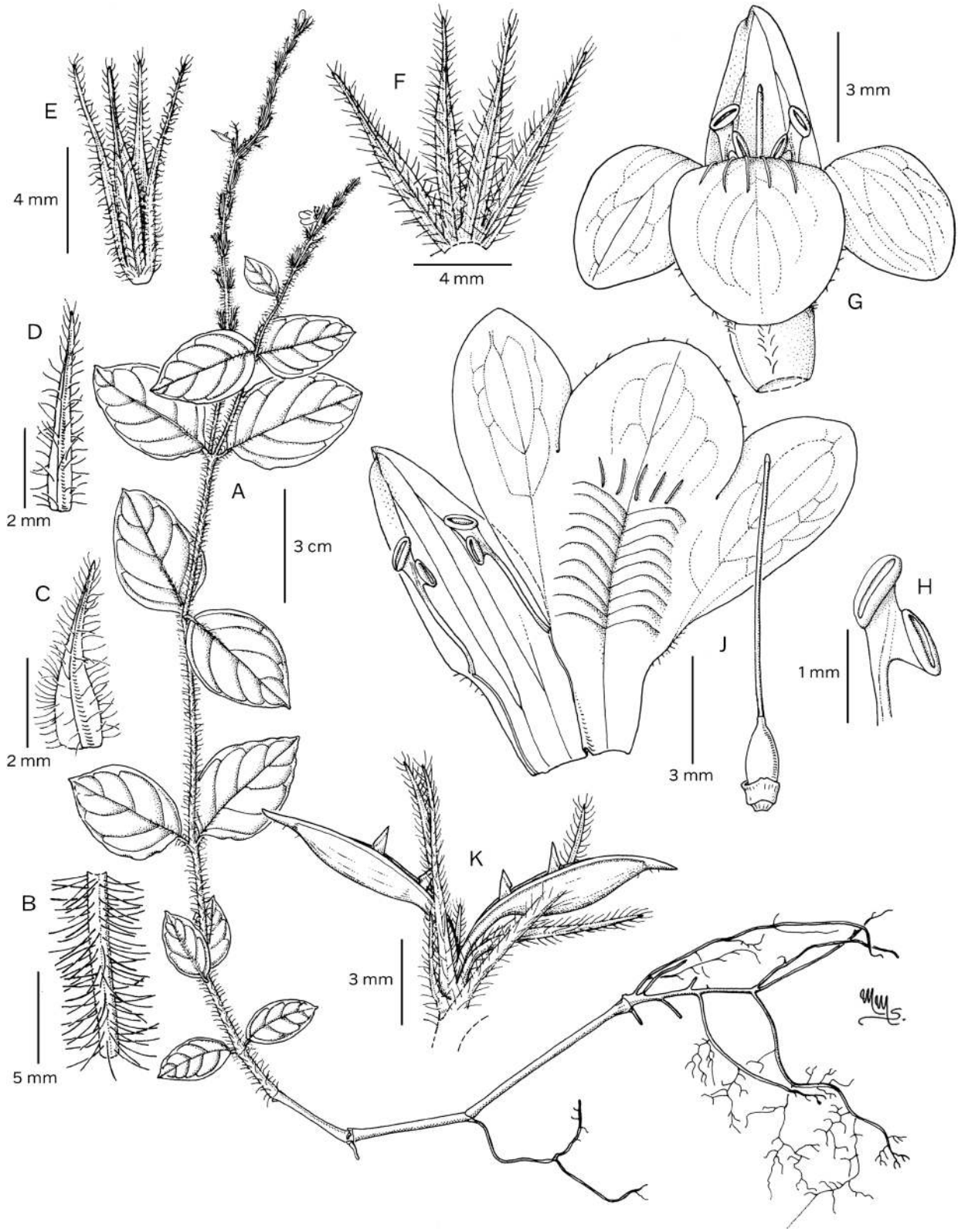

Fig. 15. *Justicia macuirensis*. **A** habit; **B** section of stem to show pubescence; **C** bract; **D** bracteole; **E** calyx; **F** calyx opened out showing pubescence; **G** corolla; **H** anther; **J** corolla opened out to show gynoecium; **K** capsule. **A** – **K** from *Sugden* 293 and *Bernal & Sugden* 52. DRAWN BY MARCELA MORALES.

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et al. 16053 (COAH), ibid., Mun. Piamonte, Corregimiento de Nápoles, Vereda La Florida, 650 m, *D. L. Hurtado* 813 (COAH). **Putumayo:** Mun. Orito, Vereda el Líbano, 1200 m, 0°39'29"N 77°05'13"W, *D. Cárdenas* 51199 (COAH); ibid., Vereda el Líbano, 716 m, 0°38'14"N 77°01'7"W, *N. Marín et al.*6784 (COAH); Mun. Orito, Gran Jardín de la Sierra, 800 m, 0°40'29"N 77°04'51"W, *M. Montoya et al.* 1715 (COAH).

NOTE. Leonard (1958: 594) claimed that *Justicia pelianthia* "has no close relatives among Colombian species" but this is not true. It is very close to *Justicia sanchezioides* both morphologically and geographically, as can be seen in Leonard's illustrations. *J. pelianthia* differs in the laxer, clearly branched inflorescence and the narrower bracts and bracteoles (< 1.25 mm wide vs 2 – 4.5 mm wide).

Justicia perijaensis *J.R.I.Wood*, **sp. nov.** Type: Colombia, César, Mun. Codazzi, Serranía de Perijá, Vereda Siete de Agosto, 9°57'11"-33"N 73°02'46"-03'20"W, 1253 – 1662 m, 12 Dec. 2005, *O. R. Díaz, N. J. Garzón & C. A. Vargas* 2943 (holotype COL-000361195).

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Subshrub 1.5 – 2 m high, stem obscurely angled, glabrescent. *Leaves* petiolate, lamina 5 – 13 × 1.5 – 4 cm, lanceolate to narrowly oblong-elliptic, apex acuminate, base cuneate to attenuate, both surfaces minutely hirtellous when young but quickly glabrescent, cystoliths abundant, 8 – 9-veined; petioles 0.6 – 2.3 cm, minutely hirtellous, glabrescent. *Inflorescence* somewhat dimorphic consisting of solitary flowers in opposite pairs in the leaf axils of the upper part of the stem, but occasionally developing into small cymose structures with several flowers and a peduncle 0.5 – 1 cm long, the rhachis when present hirtellous; pedicels 2 – 10 mm, hirtellous; bracts 15 – 20 × 3 – 4 mm, lanceolate, somewhat foliose, early caducous; bracteoles filiform, 4 – 12 mm long, variable in length, caducous; calyx 5-lobed to base, the lobes 14 – 15 × 2 mm, lanceolate, finely acuminate, minutely hirtellous and ciliolate; corolla c. 4.3 cm long, red, shortly glandular-hirtellous on the exterior, tube c. 20 mm long, gradually widened from 2 mm to c. 6 mm at mouth, upper lip c. 16 mm long, hooded, oblong-lanceolate, entire, lower lip c. 18 mm long, rugulose, spreading, 3-lobed, the lobes obovate, rounded, c. 10 × 10 mm; filaments glabrous, anthers included in upper lip, thecae superposed, c. 2.5 × 1 mm, glabrous, upper held horizontally, the lower held vertically, shortly tailed; ovary and style glabrous. *Capsule* 17 – 20 × 6 mm, clavate, tomentellous, 4-seeded, *seeds* subglobose, c. 3 mm diam, nearly smooth. Fig. 16.

RECOGNITION. This species is somewhat similar vegetatively to *Justicia jacobinioides* Leonard in habit, indumentum and the presence of foliose, caducous bracts, but the calyx lobes are lanceolate and finely acuminate (not oblong, acute), 1-nerved (not 3-nerved), 14 – 15 mm long (not 8.5 mm long), the upper lip of the corolla is entire (not 2-lobed) and the lower lip is prominently 3-lobed with obovate lobes c. 10 mm long and wide (not very short < 1 mm long and wide). It also shows some resemblance to *J. anabasa* Leonard from Las Vegas in Santander but differs by the same calyx and corolla characters that distinguish it from *J. jacobinioides*.

DISTRIBUTION & CONSERVATION. Restricted to the Serranía de Perija, which is an extension of the Eastern Cordillera forming the boundary in the south between the departments of César and Norte de Santander and further north between César and Zulia state in Venezuela. It reaches just over 3600 m at its highest point. It is (or was) mostly covered in tropical forest but there has been extensive settlement. Map 1.

SPECIMENS EXAMINED. COLOMBIA. CÉSAR: Mun. Codazzi, Serranía de Perijá, Vereda Siete de Agosto, 9°57'11 – 33"N 73°02'46 – 03'20"W, 1253 – 1662 m, 12 Dec. 2005, *O. R. Díaz, N. J. Garzón & C. A. Vargas* 2939, fr (COL000361190); *O. R. Díaz, N. J. Garzón & C. A. Vargas* 2943, fl (COL 000361195).

HABITAT. Degraded premontane forest in the Serranía de Perijá in César at around 1500 m.

ETYMOLOGY. This species is named after the Serranía de Perijá where it was found.

NOTE. The new species is not the only *Justicia* sp. endemic to the Serranía de Perijá, specifically this part. *J. enarthrocoma* Leonard was found 12 km east of Codazzi (10°01'N 73°13'W) and *J. jacobinioides* between Ocaña and Pamplona. The new species bears little resemblance to the former.

Justicia pilosa (*Ruiz ex Nees*) *Lindau* (1897a: 350).

Adhatoda pilosa Ruiz ex Nees (1847: 405). Type: Peru, Juana del Río, *Mathews* 1524 (lectotype K000529360 ex Herb. Hooker, designated here).

This species is widely distributed in the Amazon basin with records from Bolivia, Brazil, Peru and Ecuador so its occurrence in Colombia is not unexpected, the collections cited below represent the first recorded occurrence of this species in Colombia. It should be noted that the illustration in the *Flora of Ecuador* (Wasshausen 2013: 149) appears to be a different species as the shape of the bracts does not conform to those of *Justicia pilosa*.

COLOMBIA. Cundinamarca: Mun. Medina, vía hacia La Mesa del Cura, 750 m, *O. Montenegro et al.* 002 (COL), *O. Montenegro et al.* 003 (COL), ibid., *C. Tinjacá* 050 (COL). **Meta:** Villavicencio, Caños Negros, 490 m, 21 Jan. 1956, *J. M. Idrobo* 2014 (COL). **Amazonas:** Corregimiento La Victoria 0°02'35"S 70°56'32"W, *J.*

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Fig. 16. *Justicia perijaensis*. **A** habit with axillary flowers; **B** branched fruiting inflorescence; **C** flower showing calyx and corolla; **D** bract; **E** bracteole; **F** calyx and style; **G** corolla opened up to show anthers; **H** anther; **J** ovary; **K** capsule; **L** seed, lateral view; **M** seed, view from above. **A**, **C** – **J** from *O. R. Díaz, et al*. 2943; **B**, **K** – **L** from *O. R. Díaz, et al*. 2939. DRAWN BY MARCELA MORALES.

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Betancur et al. 13732 (COL, HUA); Río Cahuinarí, *G. Galeano & A. Miraña* 1642 (COL), *G. Galeano & A. Miraña* 1766 (COL); Región de Araracuara 0°36'S 72°10'W, *A. Idárraga & E. Myarco* 1834 (JAUM). Map 1.
TYPIFICATION. Nees cited various syntypes of which the most suitable for lectotypification would have been a Ruiz collection from Vitoc in Peru at Berlin (B). Although there is a photograph of this collection at F, the specimen itself was destroyed in 1943, so the other specimen cited by Nees, *Mathews* 1524, is here designated as the lectotype.

Justicia reniformis *J.R.I.Wood*, **sp. nov.** Type: Colombia, Antioquia: Mun. Puerto Triunfo, Gruta el Cóndor, 5°56'N 74°50'W, 350 m, 22 Oct. 1988, *A. Cogollo, J. G. Ramírez & M. Agudelo* 4253 (holotype COL-000208085; isotype JAUM-021076).

http://www.ipni.org/urn:lsid:ipni.org:names:77338123-1

Subshrub 0.5 – 2 m high, stems coarsely bifariously villous with transparent, multicellular brown hairs. *Leaves* petiolate, subequal; laminas 7 – 18 × 3 – 9.5 cm, broadly oblong-elliptic, apex shortly acuminate, base slightly oblique, broadly cuneate, truncate or subcordate, margin obscurely undulate, adaxially glabrous or with a few scattered white hairs, abaxially paler with prominent shortly pubescent veins, the hairs brownish, otherwise glabrous with prominent cystoliths, veins 8 – 10 pairs; petioles 2 – 5.5 cm, coarsely villous with transparent brown hairs. *Inflorescence* of solitary terminal spikes 3 – 10 cm in length, rarely the spike with a single lateral branch or a short secondary spike arising from an upper leaf axil; peduncles c. 10 mm long, villous; rhachis densely but shortly hirtellous; flowers imbricate; bracts glandular-pubescent, spathulate-reniform, apex shortly apiculate, the pseudo-petiolate base 2 – 5 mm long, the expanded part 2 – 3 × 5 mm; bracteoles 2 – 3 × 1 mm, deltoid; calyx subequally 5-lobed, the lobes 3 × 1 mm, lanceolate, puberulent; corolla 10 – 12 mm long, pubescent, variously reported as white or white with greenish tube and upper lip purplish, tube 6 × 1 mm, gradually expanded, upper lip 3 mm, notched, lower lip 3-lobed, the lobes 2 – 3 × 1 mm, oblong, rounded, pubescent; filaments pubescent, anthers included, thecae linear, c. 1.5 × 0.5 mm, inserted at same height, parallel, glabrous, basal appendages absent; style c. 9 mm, glabrous, ovary glabrous. *Capsule* 12 × 2 mm, weakly clavate, glabrous, 4-seeded; *seeds* c. 3 × 3 mm, lenticular, rugulose. Fig. 17.

RECOGNITION. Resembles *Justicia axiologa* (Leonard) J.R.I.Wood in general habit and distinct linear anther thecae which are parallel and equally inserted, but bracts much smaller (4 – 8 × 5 mm, not c. 15 × 10 mm), the expanded part reniform, ±twice as broad as long (vs suborbicular, as long as broad), calyx 5-lobed (not 4-lobed), corolla much smaller 10 – 12 mm long (not 25 – 30 mm long).
DISTRIBUTION & CONSERVATION. Endemic to river canyons in the karst limestone region of eastern Antioquia, perhaps restricted to the Río Claro area. Map 1.
ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. ANTIOQUIA: Mun. San Luis, Cañón del Río Claro, 325 m, 13 Aug. 1983, *A. Cogollo* 616 (COL000208083, HUA, JAUM); ibid., 5°53'N 74°51'W, 330 m, 22 Nov. 1988, *A. Cogollo & D. Cárdenas* 3710 (COL000208084, JAUM); ibid., 5°54'N 74°51'W, 8 May 1983, *T. Croat* 56553 (JAUM, MO); ibid., 5°53'30"N 74°51'20"W, 21 April 2003, *T. Croat & F. Cardona* 97880 (HUA); ibid., 5°54'04"N 74°51'24"W, 300 – 350 m, 14 May 2012, *J. L. Clarke et al.* 12909 (COL000452174, HUA); ibid., 5°59'N 74°54'W, 300 m, *D. C. Daly & J. Betancur* 5372 (COL000210324, HUA0009581); ibid., Reserva El Refugio, 5°57'N 74°51'W, 31 Jan. 1986, *L. McDade & B. Stein* 996 (COL000208086, JAUM); Mun. San Luis, Cañón del Río Claro, 5°49'59"N 74°52'00"W, *H. David et al.* 1417 (HUA); Mun. Sonsón, Planta de Argos, 400 m, 5°52'52"N 74°50'38"S, 21 Aug. 2012, *H. David et al.* 3977 (COL000452016, HUA); ibid. 5°52'35"N 74°50'5"W, *H. David et al.* 4107 (COL000452021, HUA); Mun. Sonsón, frente a Bassala, 5°52'18"N 74°51'00"S, 417 m, *P. Q. Trujillo* 6465 (HUA); Mun. Sonsón, Corregimiento Jerusalén, Refugio Río Claro, 5°53'24.33"N 74°51'22.26"W, 360 m, *D. A. Zapata et al.* 2135 (JAUM).
HABITAT. Lowland tropical rain forest on limestone rock outcrops at around 300 – 400 m.
NOTE. Municipio data has been taken from labels and may not all be accurate but all records seem to be from the Río Claro.

Justicia rheophytica *J.R.I.Wood & Hoyos-Gómez*, **sp. nov.** Type: Colombia, Antioquia, Mun. San Luis, Río Samaná norte, 2 km debajo del puente sobre Río Samaná 6°00'59"N 74°50'51"W, 430 m, 18 Dec. 2016, *S. E. Hoyos-Gómez, R. Bernal, H. Favio Manrique, S. Bernal & J. Domine* 3101 (holotype HUA-0030340).

http://www.ipni.org/urn:lsid:ipni.org:names:77338124-1

Perennial rheophyte 20 – 50 m high, branched from the somewhat woody base, with wiry glabrous stems and mat forming rootstock. *Leaves* somewhat imbricate and coriaceous, petiolate, subequal, lamina 2.5 – 6 × 0.5 – 1 cm, narrowly oblong, acuminate at both ends, glabrous, cystoliths abundant on both surfaces, the midrib very prominent abaxially; petioles 0.3 – 1 cm. *Inflorescence* of ±imbricate spikes which

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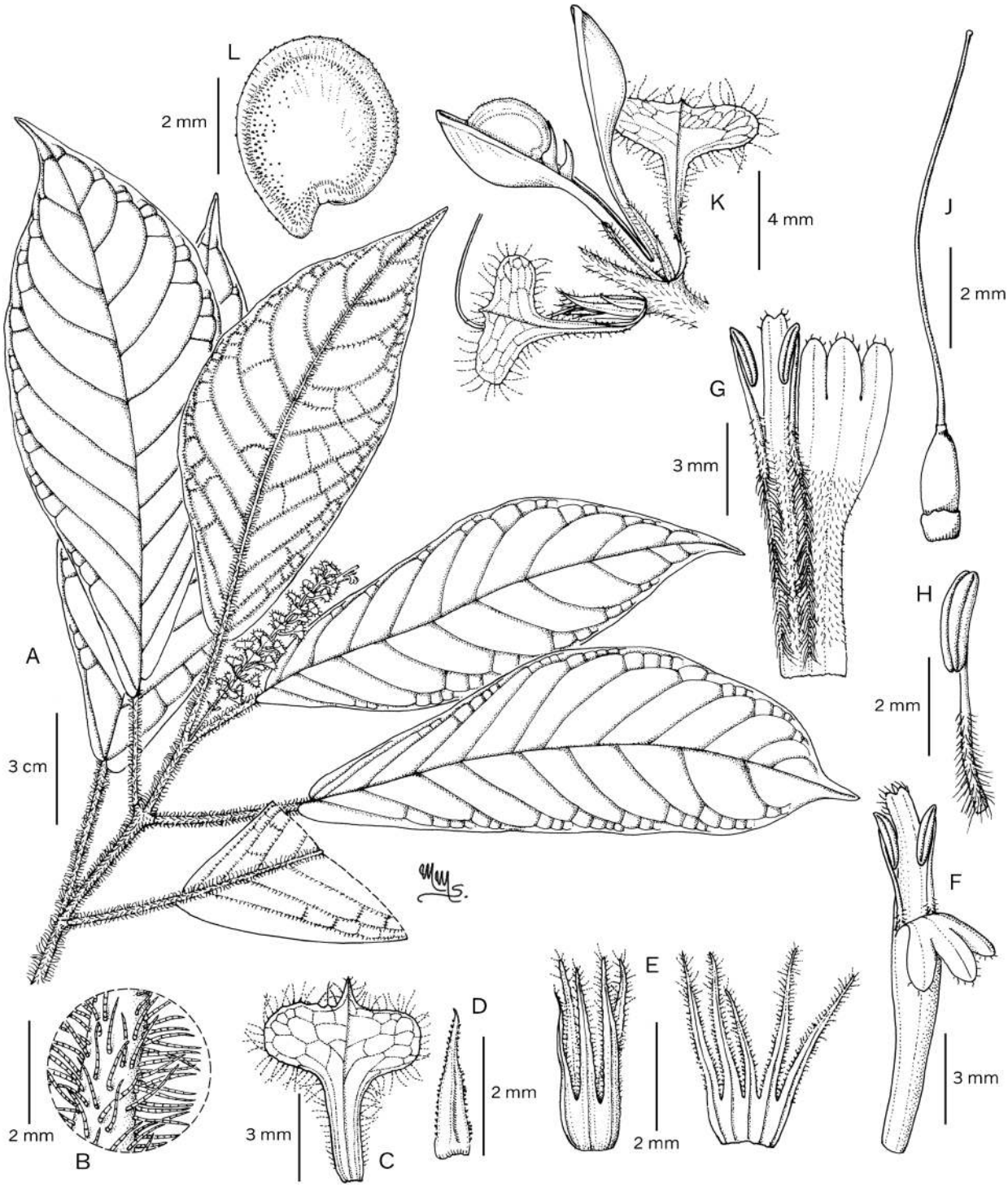

Fig. 17. *Justicia reniformis*. **A** habit; **B** detail of indumentum of stem; **C** bract; **D** bracteole; **E** calyx; **F** corolla; **G** corolla opened out to show stamens; **H** stamen with anther; **J** ovary and style; **K** capsule (with bracts); **L** seed. **A** – **L** from *A. Cogollo et al*. 4253. DRAWN BY MARCELA MORALES.

arise terminally and from upper leaf axils, c. 2 – 3 cm in length; peduncles 3 – 5 mm, scurfy, glabrescent; rhachis bifariously scurfy; fertile flowers mostly arising alternately along the rhachis; bracts c. 3.5 × 2 mm, glabrous, spathulate with distinct pseudopetiole, apex rounded, finely mucronate with a

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caducous hair point c. 2 mm long; bracteoles 1.5 × 0.25 mm, filiform; calyx 5-lobed to base, lobes 4.5 – 5 × 0.5 mm, lanceolate, minutely scabrous; corolla 8 – 10 mm long, white, glabrous, tube 4 – 5 × 2 mm, 2-lipped, upper lip 2.5 mm, erect, deltoid, greenish-white, entire, lower lip c. 3 – 5 mm long, rugulose, white with faint lilac flush, 3-lobed, lobes ovate, rounded; filaments glabrous, anthers included, the thecae c. 0.5 – 0.75 × 0.25 narrowly elliptic, glabrous, superposed, the lower tailed; ovary glabrous, style glabrous, stigma globose. *Capsule* 5 – 6 × 2 mm, clavate, acute, glabrous, 4-seeded; *seeds* 1.25 × 1 mm, rugose. Figs 18 – 19.

RECOGNITION. Near glabrous herb of characteristic rheophytic habit, comparable amongst Colombian species of *Justicia* only to *J. namatophila* and *J. ipanorensis* but readily distinguished from the former by the white corollas (not purple), near terminal inflorescence formed of short, simple spikes (vs axillary, often branched) and spathulate (not linear) bracts and from the latter by the smaller bracts, c. 3.5 × 2 mm, not 7 – 9 × 5 – 6 mm and corolla, 8 – 10 mm long (not 10 – 13 mm) as well as the glabrous (not densely pubescent) capsule.

DISTRIBUTION & CONSERVATION. Endemic to river canyons in the karst limestone region of eastern Antioquia, where it is known from three locations, none of which is currently protected. The low number of records suggest it is rarer than other species from this area.

ADDITIONAL SPECIMENS EXAMINED. COLOMBIA. ANTIOQUIA: Mun. San Luis, vereda La Garrucha, Río Samaná Norte, 5°58'44"N, 74°56'16"W, 620 m, 28 May 2017, *A. Cogollo et al.* 13260 (JAUM); Mun. San Francisco, Río Melcocho y San Francisco, 5°56'12.05"N 75°6'76"W, 450 – 470 m, 12 June 2013, *S. E. Hoyos-Gómez et al.* 3201 (HUA).

HABITAT. On periodically flooded sand and rock in river canyons, passing through tropical rainforest, 430 – 620 m.

Justicia santanderana *J.R.I. Wood & Hoyos-Gómez,* **sp. nov.** Type: Colombia. Santander: Mun. Floridablanca, Vereda Alsacia, 7°04'51.07"N 73°02'40.9"W, 1500 m, Sept. 2011, *Daysi Carmona, Camilo Solano y Jorge Mercado* 36 (holotype HUA-0036366).

http://www.ipni.org/urn:lsid:ipni.org:names:77338125-1

Scandent perennial to 5 m, stem quadrangular, somewhat woody, obscurely bifariously scurfy. *Leaves* petiolate, subequal, lamina 5 – 13 × 2 – 5 5 cm, ovate to oblong-elliptic, apex acuminate, base cuneate to subtruncate, both surfaces glabrous, somewhat reticulate abaxially; petioles 3 – 5 mm, glabrous. *Inflorescence* of terminal spikes 3 – 5 cm long, sometimes with shorter spike from an upper leaf axil; flowers imbricate, peduncle 1 – 4 cm, pedicels c. 1 mm; bracts oblong, c. 5 × 1 mm, slightly scurfy; bracteoles 1.5 × 0.5 mm, deltoid, scale-like; calyx 5-lobed to base, lobes 5.5 × 0.75 mm, lanceolate, obscurely ciliolate; corolla 5 – 6 cm long, "fuchsia with yellow interior", densely pubescent, tube 3.5 – 4 cm long, gradually widened from 1.5 mm at base to 4 mm, upper lip 13 mm long, lanceolate, shallowly notched, lower lip spreading, c. 15 mm long, 3-lobed, lobes ovate, rounded; filaments glabrous, thecae oblong, 2.5 × 0.75 mm, superposed, parallel, glabrous, the lower acute at base; ovary and style glabrous. *Capsule* and *seeds* not seen. Fig. 20.

RECOGNITION. This shrubby species will key out as *Justicia sciota* Leonard because of the near glabrous stem and leaves, dense spikes and short narrow bracts, but differs in the lanceolate, obscurely ciliolate calyx lobes c. 5.5 mm long (not triangular, ciliate, c. 3 mm long), longer corolla (5 – 6 cm, not up 3.8 cm) and contiguous rather than well separated anther thecae. Field notes record this plant as a liana which might to be interpreted as a plant with a long woody stem scrambling over vegetation. It may thus resemble *J. fuchsiifolia* Leonard in habit.

DISTRIBUTION & CONSERVATION. The type locality lies in the Andes east of Bucararamanga. Although the Municipio de Floridablanca (Map 1) is essentially a suburb of Bucaramanga, the Vereda Alsacia in the eastern part of the municipality still has extensive areas of woodland and it is assumed that the new species was growing in this woodland or along paths through it. There is no information about the precise habitat or frequency of the plant.

SPECIMENS EXAMINED. COLOMBIA. SANTANDER: Mun. Floridablanca, Vereda Alsacia, 7°04'51".07N 73°02' 40".9W, 1500 m, Sept. 2011, *D. Carmona et al.* 36 (holotype HUA 0036366); ibid., July 2012, *D. Carmona et al.* 37.

HABITAT. There is no habitat information on the labels.

Justicia spicigera *Schltdl.* (Schlechtendal 1832: 395 – 396). Type: Mexico, Jalapa, *Schiede* 77 (syntypes BM, HAL, MO).
Jacobinia spicigera (Schldtl.) L.H.Bailey (1915: 1715).

This species was previously only known from an old collection by Lehmann from Dabeiba in NW Antioquia (Leonard 1958: 658; Bernal *et al.* 2016). The following more recent records from northern Chocó confirm the continued presence of this species in NW Colombia near Panama in and near the Los Katios National Park. Map 1.

COLOMBIA. CHOCÓ: Mun. de Acandí, Corregimiento de Unguía, Reserva Indígena Ciénaga de Uguía, 100 m, 21 June 1976, *L. E. Forero* 477 (COL). P.N. Los Katíos, camino a Los Saltos El Tendal y La Tigra, 10 m, 23 March 1995, *Enrique Rentería et al.* 10964 (HUA); ibid., Mun. Riosucio, camino a Los Saltos El Tendal y La Tigra,

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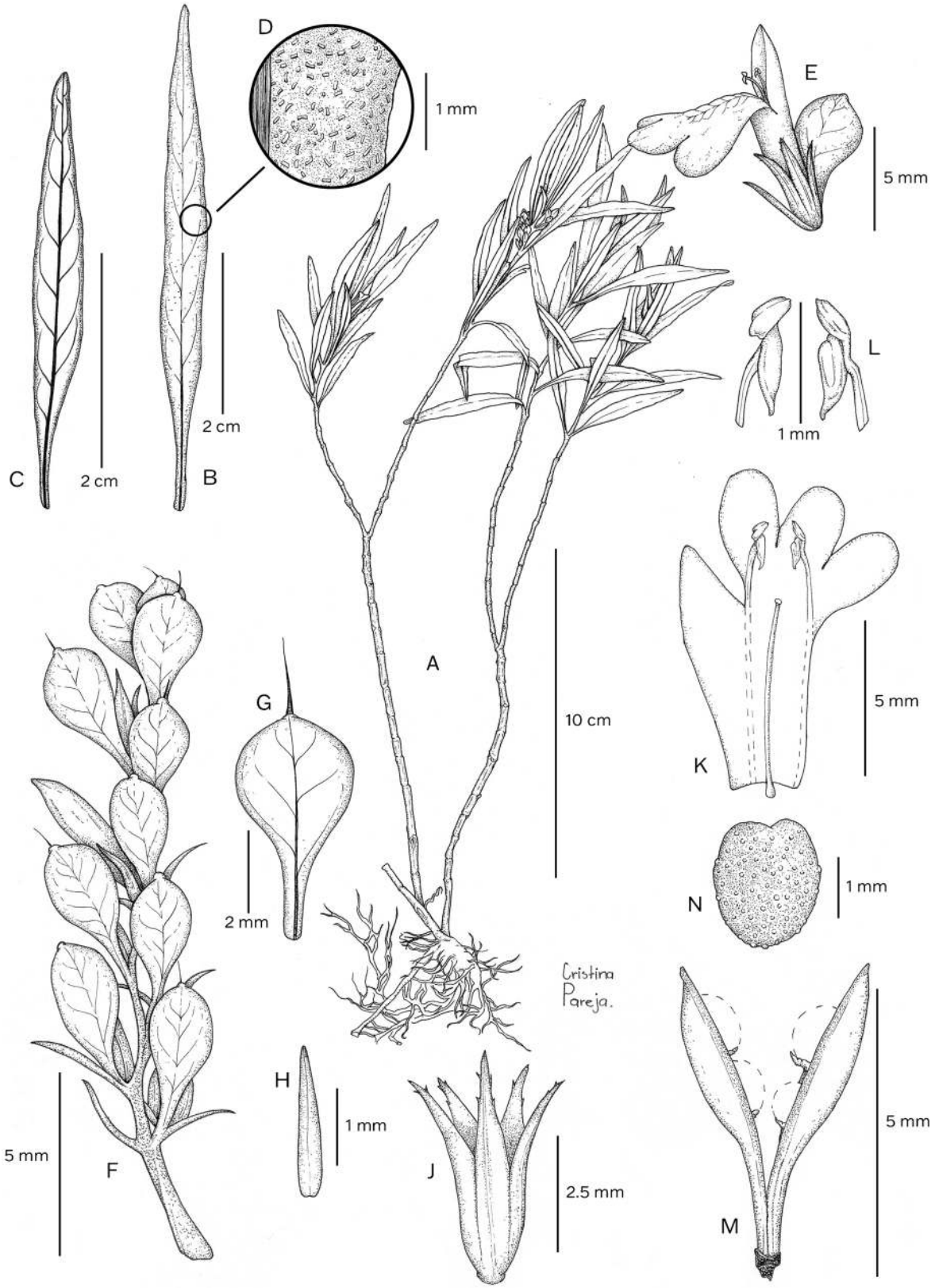

Fig. 18. *Justicia rheophytica*. **A** habit; **B** leaf (adaxial surface); **C** leaf (abaxial surface); **D** detail of adaxial surface showing cystoliths; **E** flower; **F** inflorescence branch; **G** bract; **H** bracteole; **J** calyx; **K** corolla opened out; **L** anthers; **M** capsule; **N** seed. **A** – **N** from *A. Cogollo et al*. 13260. DRAWN BY CRISTINA PAREJA.

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Fig. 19. *Justicia rheophytica*. PHOTO: SAÚL E. HOYOS-GÓMEZ.

28 – 29 March 1999, *Ramiro Fonnegra, Fernando Álzate, Paula Mejía et al.* 6910 (HUA).

NOTE. Very distinctive because of the tendency of the leaves to turn dark bluish-black so leading Al Gentry to identify *Forero* 477 as *Justicia tinctoria*. The inflorescence is unusual in various ways. It is much-branched with slender axillary cymes with a primary peduncle 1.8 – 2.8 cm long and branches 5 – 6 mm long. Like *J. megalantha* Wassh. & J.R.I.Wood this species lacks obvious bracteoles.

Justicia stereostachya *Leonard* (1958: 639). Type: Colombia, Arauca [Norte de Santander], Río Cubugón valley near Carare, *J. Cuatrecasas* 13061 (holotype US 00137175; isotypes COL, F).

H. García Barriga & G. Lozano 18314 (COL) collected in the valley of the "Río del Oro en frontera Venezolana" in Norte de Santander represents an additional record of this species.

Justicia trianae (*Leonard*) *J.R.I.Wood* (2009: 54).

Pelecostemenon trianae Leonard (1958: 648). Type: Colombia, Meta, Villavicencio, *Triana* s.n. (holotype K).

Subshrub 0.8 – 2 m high; stem ±quadrangular, glabrous. *Leaves* petiolate, subequal; laminas 5 – 19 × 2 – 9 cm, narrowly oblong-elliptic, somewhat dimorphic, finely acuminate and falcate on side branches, broadly oblong-elliptic and shortly acuminate on main branches, base attenuate, slightly oblique, margin entire, both surfaces glabrous with abundant cystoliths, abaxially paler; petioles 4 – 10 mm, glabrous. *Inflorescence* of long lax spikes arising from the upper leaf axils and terminal on the main stem, often forming a complex terminal inflorescence with trifurcate branching up to 40 × 20 cm; branches 5 – 20 cm long, the flowers in opposite pairs (but often solitary) 10 – 15 mm apart, peduncles 5 – 9 mm long, glabrous; rhachis and inflorescence branches densely hirtellous with short glandular hairs; bracts c. 3 × 1 mm, deltoid, acute, densely hirtellous with short glandular hairs; bracteoles similar but narrower, c. 4 × 0.5 mm; calyx subequally 4-lobed to base, lobes 12 – 13 × 1 mm, linear acuminate, densely hirtellous with short glandular hairs; corolla pubescent on the exterior, probably reddish-orange, basal tube cylindrical 35 – 43 × 1.25 mm, 2-lipped, upper lip, c. 6 mm long, notably short, lower lip c. 12 mm long, rugulose, 3-lobed, the lobes suborbicular, rounded; stamens included, filaments c. 8 mm, the anther thecae linear 2 × 0.5 mm,

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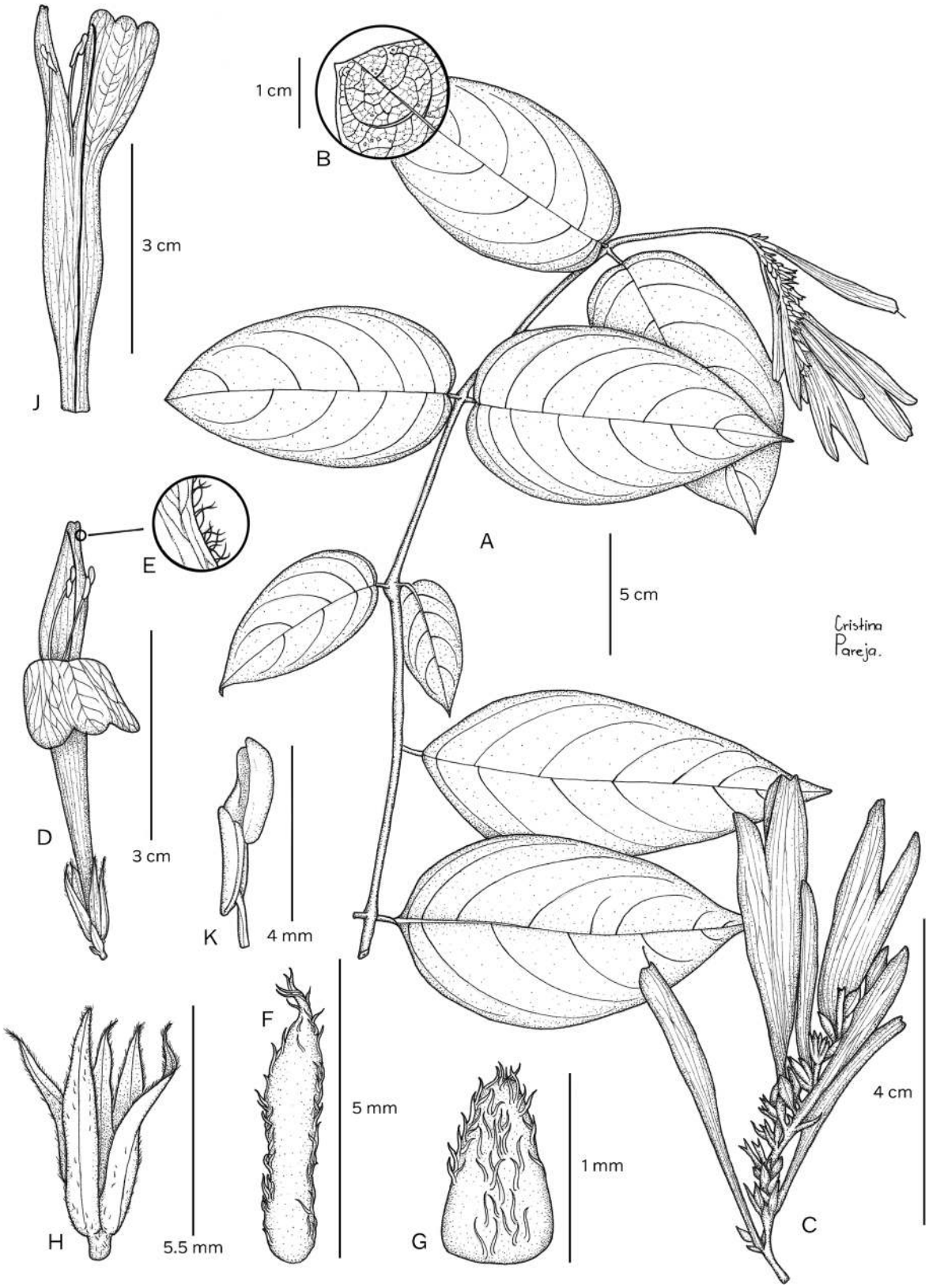

Fig. 20. *Justicia santanderana*. **A** habit; **B** detail of adaxial surface of leaf; **C** inflorescence; **D** flower; **E** detail of corolla indumentum; **F** bract; **G** bracteole; **H** calyx; **J** corolla; **K** anther. **A** – **K** from *D. Cardona et al*. 36. DRAWN BY CRISTINA PAREJA.

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superposed, glabrous, the upper theca acute at base, the lower tailed but poorly developed and apparently sterile; style 4 – 5 cm long, puberulent below, glabrous above; ovary puberulent. *Capsule* 25 × 4 mm, clavate, apically glandular-hirtellous, 4-seeded; *seeds* c. 2 mm diam. lenticular, rugose. Figs 21 – 22.

DISTRIBUTION & CONSERVATION. The type was collected by Triana at or perhaps near Villavicencio in the eastern foothills of the Eastern Cordillera of the Andes. Recent collections are mainly from the Municipio de Medina in Cundinamarca, which lies about 70 km NNE of Villavicencio at 600 – 770 m. The habitat is not precisely known but the area originally consisted of humid sub-Andean tropical forest. There is an additional record from Boyacá from humid forest but at an estimated altitude of 1800 m, suggesting the species may be more widespread than the few records suggest. A roadside record also implies that this species is tolerant of disturbance.
SPECIMENS EXAMINED. COLOMBIA. BOYACÁ: Cascada Salto La Candela between Lago Tota and Yopal, 1800 m, 18 March 1984, *J. R. I. Wood* 4299 (COL, K). **Cundinamarca:** Mun. Medina, Vereda Choapal, 750 m, 3 March 1987, *C. Tinjada* 025 (COL000161005); ibid. 770 m, *S. Tellez et al.* 022 (COL000160991), ibid. *S. Tellez et al.* 022A (COL000160990); Mun. Medina, Farallón de Medina al lado del camino, 4°35'09"N 73°23'06"W, 600 m, 25 Feb. 1997, *H. Mendoza* 2214 (COL000210367).
HABITAT. Andean premontane and montane forest.
NOTES. *Justicia trianae* has a remarkable anther structure, which led Leonard to place it in a distinct genus, *Pelecostemenon* Leonard. This was distinguished by the distinct anthers in which the lower cell is infertile and reduced in size and with a distinct tail (Fig. 22). Similar abnormal lower anther cells are found in other species of *Justicia*, especially those previously placed in *Chaetothylax* Nees, which similarly has a 4-lobed calyx. Leonard was unable to describe properly developed flowers of *J. trianae* as they are not present on the type. They are rather unusual with a long, slender, cylindrical tube similar to that found in species previously placed in *Chaetothylax* but the branched, spicate inflorescence with flowers in distant pairs is quite different so a full description and illustration of this very poorly known species is provided above.

Justicia zamorensis *Wassh.* (Wasshausen 2013: 124). Type: Ecuador, Zamora-Chinchipe: horse trail Guadalupe-San José de Yacuambi, along Río Yacuambi, *Harling & Andersson* 13927 (holotype GB-0105910; isotype US).

The following is a new record of this Ecuadorian species for Colombia:

COLOMBIA. Putumayo: Instituto Centro Experimental Amazónica, Mun. Mocoa. Vereda San José de Pepino, c. 1°12'N 76°36'W, 470 – 670 m, *F. Arteaga & O. Ortega* 025 (COL, COAH). Map 1.

Ruellia *L.*

Ruellia rheophytica *J.R.I.Wood & Hoyos-Gómez*, **sp. nov.** Type: Colombia, Antioquia, Mun. San Luis, Vereda La Arabia, sector El Guayabo, Río San Miguel, 6°2'38"N 74°55'21"W, 330 m, 12 July 2017, *Álvaro Cogollo, Marcela Montoya Jiménez, Alejandro Camargo García, Gabriel Guzmán, & Edison Duque* 13534 (holotype JAUM-084901).

http://www.ipni.org/urn:lsid:ipni.org:names:77338126-1

Erect, perennial *rheophytic herb* 15 – 30 cm high, rootstock fibrous; stem bifariously scurfy upwards, glabrescent. *Leaves* petiolate, subequal, lamina 3.7 – 7 × 0.7 – 1.5 cm, narrowly oblong, apex finely attenuate, base attenuate, margin with a few cilia, midvein prominent, adaxially yellowish and scurfy puberulent, abaxially wine-red, both surfaces otherwise glabrous and with abundant cystoliths; petioles 5 – 8 mm. *Inflorescence* a terminal bracteate cluster, peduncle 3 mm; bracts 13 – 14 × 3 mm, oblong, apex acuminate, slightly falcate, adaxially glabrous, abaxially puberulent on the veins; bracteoles similar but smaller, c. 8 × 1.5 mm, oblong-lanceolate; calyx subequally 5-lobed, lobes 3.5 – 4 × 1 mm at anthesis, accrescent to 7 × 1.25 in fruit, lanceolate, finely acuminate, ciliolate; corolla 2 – 2.2 cm long, pubescent, tube white, c. 1.1 cm long, gradually widened from base, limb subequally 5-lobed, c. 9 – 12 mm diam, pale blue; stamens included, longer filaments c. 3 mm, shorter c. 2 mm, anthers ellipsoid, c. 1 mm long; ovary and style glabrous. *Capsule* 9 × 3 mm, oblanceolate in outline, glabrous, 6 – 8-seeded; seeds flattened, rounded, c. 2.5 mm diam. Figs 23 – 24.

RECOGNITION. This species has been identified with *Ruellia geminiflora* Kunth and indeed superficially resembles another related cerrado species, *R. bulbifera* Lindau in its very sparse indumentum and subterminal inflorescence but differs in the fibrous (not fleshy fusiform) rootstock and narrowly oblong, finely attenuate leaves (not elliptic with rounded apex).
DISTRIBUTION & CONSERVATION. Endemic to river canyons in the karst limestone region of eastern Antioquia, where it is known from three locations, none of which is currently protected.
SPECIMENS EXAMINED. COLOMBIA. ANTIOQUIA: Mun. San Luis, Río Samaná Norte, 2 km aguas abajo del puente de la carretera Medellín-Bogotá, 6°59'19"N 74°55'51.04"W, 430 m, 18 Dec. 2016, *S. E. Hoyos-Gómez et al.* 3103 (HUA); Mun. San Luis, Río Samaná

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Fig. 21. *Justicia trianae*. **A** habit; **B** side branch with falcate leaf; **C** detail of stem showing pubescence, which is similar to that of calyx, bract and bracteole; **D** bract; **E** bracteole; **F** calyx; **G** flower; **H** flower opened up to show stamens, ovary and style; **J** anther; **K** capsule; **L** seed. **A** – **L** from *Tellez* 022A and *Mendoza* 2214. DRAWN BY MARCELA MORALES.

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Fig. 22. *Justicia trianae*. Dissection of corolla showing distinct anther thecae. PHOTO: M. MORALES.

Norte, 5°55'44"N 74°57'59"W, 420 m, 9 Sept. 2017, *S. E. Hoyos-Gómez et al.* 3272 (HUA).
HABITAT. Rheophyte growing on periodically submerged riverside limestone rocks in tropical rainforest.
NOTE. This plant is a classic rheophyte as described by Van Steenis (1981: 31). It is a mat-rooting land plant with an inflorescence that "hardly ever exceeds the leaves and is often embedded in the apical leaf tufts terminating the branches…. The stem and twigs are usually tough… with dense foliage with short internodes, (the leaves) linear, oblong-lanceolate, lanceolate, often falcate, the texture firm."

The only other rheophytic *Ruellia* known to us is *Ruellia gracilis* Rusby, an uncommon, red-flowered species endemic to the Yungas of La Paz, Bolivia.

Stenandrium *Nees*

Stenandrium fosbergii (*Leonard*) *Wassh.* (Wasshausen 1996: 387).

Aphelandra fosbergii Leonard (1958: 711). Type: Colombia, Cundinamarca, San Isidro, 8 km south of Gachalá, 2450 m, *M. L. Grant & F. R. Fosberg* 9319 (holotype US).

The following additional records have been seen:
COLOMBIA. Cundinamarca: between Hato Grande and Cuchilla de Ubalá, E of Gachetá, 2200 m, *J. R. I. Wood* 5076 (COL, K); Chicaque Park above San Antonio de Tena, 2500 m, *J. R. I. Wood* 8929 (K). Both growing in moist forest by streams.

Stenostephanus *Nees*
This is a very diverse genus of cloud forest in Colombia but, apart from *Stenostephanus sanguineus* (Nees) Wassh., and *S. lasiostachyus* Nees, all species are localised in their distribution, and many are only known from the type collection or type locality. It is very difficult to assess the significance of variation without more collections and the status of some species is uncertain. Records of the following three species are significant:

Stenostephanus aglaüs (*Leonard*) *J.R.I. Wood* (2009: 51).
Habracanthus aglaüs Leonard (1958: 428). Type: Colombia, Putumayo, [Mun. San Francisco], Planada de Minchoy, *J. Cuatrecasas* 11435 (holotype COL).

Previously known only from the type collection, the following are additional records:
COLOMBIA. Putumayo: Mun. de Orito, Gran Jardín de la Sierra, camino principal hacia el Cerro Soplín, 0°40'59"N 77°5'27"W, 972 m, *M. Montoya et al.* 1028 (COAH); ibid., ladera del Cerro Azul, cerca Quebrada la Esmeralda 0°42'44"N 77°7'21"W, 1200 m, *M. Montoya et al.* 1082 (COAH). Map 1.
NOTE. This species has very distinctive, large ovate leaves up to 20 × 14 cm, narrowed abruptly to a broadly cuneate base, combined with a dense inflorescence.

Stenostephanus cuatrecasasii (*Leonard*) *J.R.I. Wood* (2009: 52).
Habracanthus cuatrecasasii Leonard (1958: 426). Type: Colombia, Caquetá, Cajón de Pulido, Quebrada del Río Hacha, Cordillera Oriental, *J. Cuatrecasas* 11435 (holotype COL).

D. Cárdenas et al. 48662 (COAH) represents the first record since the type. It was collected in Caquetá at 2400 m, on the carretera antigua de Florencia a Neiva, sector Gabinete, 1°52'50"N 75°0'47"W.

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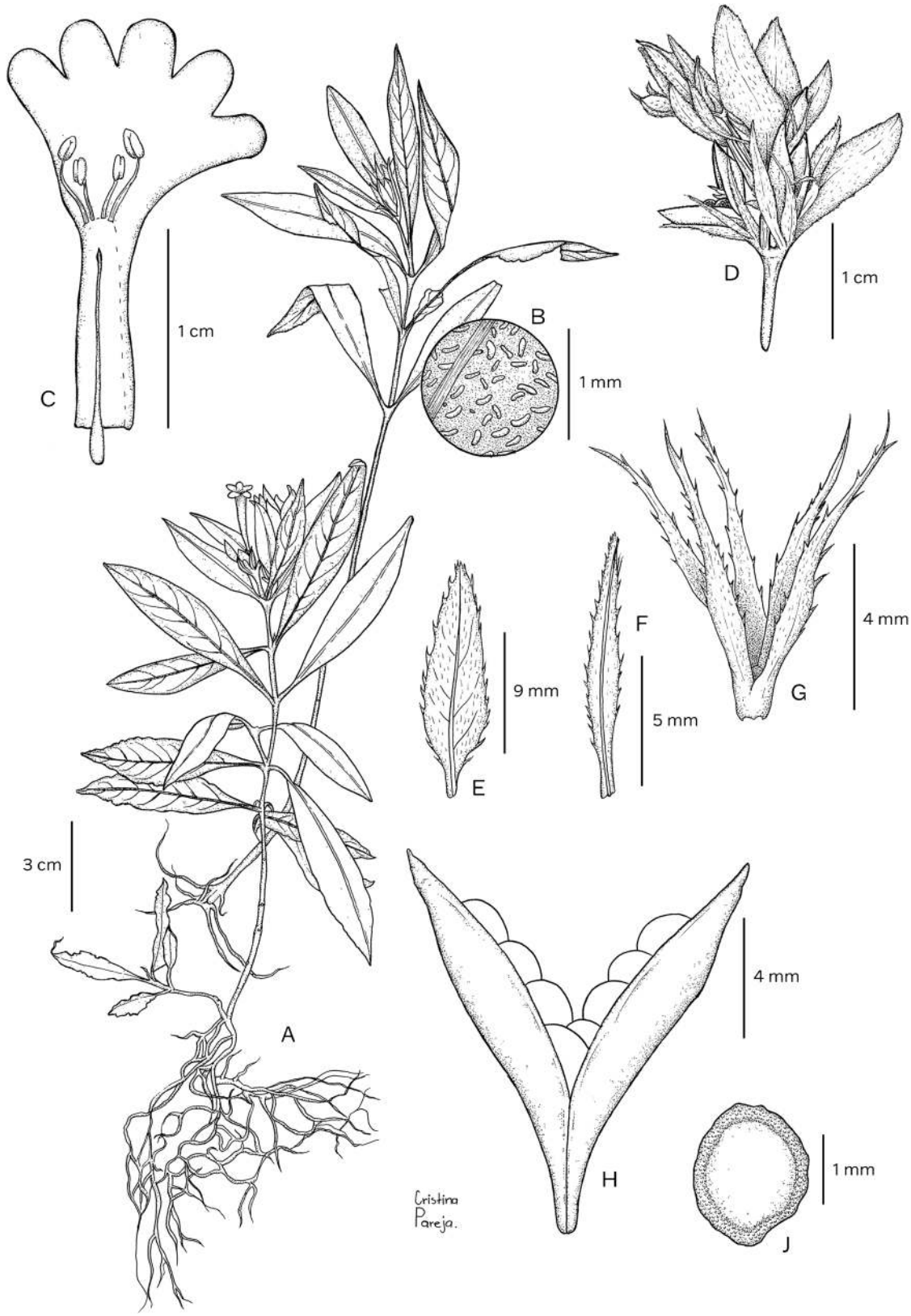

Fig. 23. *Ruellia rheophytica*. **A** habit; **B** detail of leaf showing cystoliths; **C** corolla; **D** inflorescence; **E** bract; **F** bracteole; **G** calyx; **H** capsule; **J** seed. **A** – **G** from *A. Cogollo et al*. 13534, **G** – **J** from *Hoyos-Gomez et al*. 3103. DRAWN BY CRISTINA PAREJA.

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Fig. 24. *Ruellia rheophytica*. PHOTO: SAÚL E. HOYOS-GÓMEZ.

Stenostephanus lasiostachyus *Nees* (1847: 311). Type: Venezuela, Caracas, *Moritz* 258 (holotype B†, photo F0BN008884).

Relatively frequent in Andean Venezuela, where it is recorded from five states (Hokche *et al.* 2008) but otherwise known hitherto only from two records from northern Peru (Wood 2019). The two records below are the first from Colombia, both from the western side of the Sierra Nevada de Santa Marta (Map 1), the second from a protected area.
COLOMBIA. **Magdalena**: Mun. Ciénaga, Flanco de la Sierra Nevada, 1000 m, 18 Jan. 1954, *Romero-Castañeda* 4606 (COL); Mun. Santa Marta, Vereda Bellavista, Reserva ProAves El Dorado, Sierra Nevada de Santa Marta 11°06'41"N 74°03'43"W, 2313 m, *G. Galeano et al.* 7604 (COL, HUA).

There also appear to be two undescribed species of *Stenostephanus* at COL but both are inadequate for formal description. *Orlando Rivero Díaz et al.* 2872 from César, Mun. Agustín Codazzi, Serranía de Perijá, Vereda Siete de Agosto, camino Páramo de tres Tetas desde la Cuchilla Macho Solo has fine filiform calyx lobes up to 25 mm long but lacks corollas. *Viviana Rodríguez* 651 from Boyacá, Chiscas, Vereda de Duartes, páramo en Montaña de Duartes was found at the unusually high altitude of 3200 – 3650 m. It has a densely hirsute inflorescence and a small corolla c. 10 mm long.

An exclusion

Poikilacanthus moritzianus (*Nees*) *Lindau* (1893: 57).
Adhatoda moritziana Nees (1847: 388). Type: Trujillo, Escuque 'Columbia', *J. W. Moritz* 1277 (holotype B†; isotypes BM, BR, G, HBG, K, Herb. Benth.; K ex Herb. Hook.).

The holotype of this species is *Moritz* 1277 which was seen by Nees in the Berlin herbarium. The Berlin specimen was destroyed in 1943 but there are isotypes in various herbaria, usually labelled simply as 'Columbia'. However, in the protologue (Nees 1847) states it was found 'In prov. Truxillo Colombiae ad Escuque'. Escuque is in Venezuela, not Colombia, so this species should not be accepted as present in Colombia despite the labels in different herbaria and references in the literature (Wasshausen 2013: 225).

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Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

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