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A new species of *Manekia* Trel. (Piperaceae) in Northwest Colombia

Una nueva especie de *Manekia* Trel. (Piperaceae) en el Noroccidente de Colombia

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Abstract

Manekia is one of five lineages recognized today in the Piperaceae. All species of *Manekia* are scandent lianas with petiolar margins extending throughout the petiole or beyond it into the leaf blade, with spikes often restricted to very short sympodial branches, appearing axillar, solitary or geminate, with four staminate flowers, anthers almost sessile and fruits partially to fully immersed in the rachis. Species of *Manekia* are entirely restricted to the Neotropics. At present, six species of *Manekia* are accepted in the genus. A detailed examination of all known collections, including the type specimens of *Manekia*, as well as field work in several areas of the Neotropics, suggest the existence of several taxonomic novelties within the genus, one of which (*Manekia betancurii*) is here described, from the western slopes of the western Cordillera in the department of Antioquia, Colombia. The new species is distinguished from all other species of *Manekia* by densely pubescent stems, petioles, peduncles, and lower surfaces of the leaves, leaves 9 pinnately nerved, and the petiolar margins extending 0.2–0.8 cm into the leaf blade. The new species is described and illustrated, a discussion on its distribution and ecology is provided and its taxonomic affinities discussed. A dichotomous key of all species recognized in *Manekia* (including *M. betancurii*) is also provided.

Key words: Neotropics, western cordillera, Las Orquídeas Natural National Park

Resumen

Manekia es uno de los cinco linajes reconocidos en la familia Piperaceae. Todas las especies de *Manekia* son lianas escandentes con las márgenes peciolares extendidas toda la extensión del pecíolo o incluso alcanzando arriba de la base foliar sobre la lámina de la hoja, con espigas a menudo restringidas a ramas simpodiales muy cortas, y aparentemente axilares, solitarias o geminadas, flores con cuatro estambres, anteras casi sésiles y frutos parcialmente a completamente inmersos en el raquis. Actualmente, seis especies son reconocidas en *Manekia*, todas ellas restringidas al Neotrópico. Un examen detallado de todas las colecciones, incluyendo ejemplares tipo de *Manekia*, así como trabajo de campo en varias áreas del Neotrópico, sugieren la existencia de varias novedades taxonómicas al interior del género, unas de las cuales, *Manekia betancurii* es descrita aquí. La nueva especie prospera en el piedemonte occidental de la Cordillera Occidental en el departamento de Antioquia, Noroccidente de Colombia. *M. betancurii* se distingue de otras especies del género por los tallos, pecíolos, estípites y envés de las hojas densamente pubescentes, hojas 9 pinnatinervias, y márgenes peciolares extendidas 0.2–0.8 cm por encima de la base foliar. Así mismo, se describe e ilustra la nueva especie, se discute su distribución y ecología y se analizan sus afinidades taxonómicas. Se proporciona una clave dicotómica de todas las especies reconocidas en *Manekia* (incluido *M. betancurii*).

Palabras clave: Neotrópico, cordillera occidental, Parque Nacional Natural Las Orquídeas

INTRODUCTION

Manekia Trel. (Piperaceae) is one of five genera recognized in the Piperaceae (Jaramillo et al. 2004, Samain et al. 2010, Wanke et al. 2007). Species of *Manekia* are easily recognized by their scandent or lianescent habit, the petiolar margins extending the entire length of the petiole and often reaching above the leaf base, both in leaves from sympodial as well monopodial branches, by the short sympodial branches which hold the spikes, the spikes often appearing axillar, and solitary or geminate, by the four staminate flowers, the four carpellate pistils, 4–5 stigmas and the berries partially or fully immersed in the rachis. Currently, six species of *Manekia* are recognized, and occur in disjunct areas in the Greater and Lesser Antilles, the Caribbean coast of Nicaragua, Costa Rica and Panamá, the Andean regions of Colombia, Ecuador and Perú, the Guiana shield in Venezuela and the southern Atlantics Forests of Brazil. *Manekia* individuals grow in karst areas, humid, premontane or montane forests at elevations from sea level to 2,000 m (Arias et al. 2006).

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Individual plants exhibit a rather distinct ecology when compared to other genera in the Piperaceae. Plants may grow and invade the litter of the forest, forming large mats of reptant stems, with very long internodes, eventually colonizing a large array of nearby phorophytes, ascending and eventually reaching the canopy of trees, often forming large masses on the top, then blooming. Thus, flowering specimens in *Manekia* are rare, and only present when the plant has reached a rather large adult size, something that may take several years (Personal observations by the authors in populations of *Manekia naranjoana* (C. DC.) Callejas ex N. Zamora, Hammel and Grayum in Costa Rica).

Manekia was originally described by William Trelease (1927a) based on specimens collected in Haiti. Curiously, Trelease (1927b) in the same year described another genus, *Sarcorhachis* Trel., based on specimens collected in Panamá and scarcely different in diagnostic features to those included in *Manekia*. Both names eventually proved to refer to the same entity and were merged under *Manekia* (Arias et al. 2006, Bornstein 1996, Brummitt 1998, Hammel et al. 2004). The taxonomy and systematics of *Manekia* has been variously explored in recent years (Arias et al, 2006, Bornstein 1996). More recently, Schubert et al. (2012) performed a cladistics analysis and recognized only three species in *Manekia*. Those authors consider that some species are rather widespread, more than previously thought.

Species of *Manekia* are not always easy to detect in herbarium material. Floral characters are very uniform in the genus, all species have basically the same type of floral bract, anthers, pistils and berries; leaves can vary in size, number of veins, as well as in the structure of sympodial branches (number of leaves, degree of development of leaves, number and position of spikes). Thus, variation in foliar characters in a single plant often are impossible to asses due to the paucity of flowering specimens or the lack of leaves from monopodial axis where collections consist only of sympodial branches. Based on the examination of most known collections of *Manekia* in the Neotropics deposited in B, BR, C, CHG, COL, CR, F, G-DC, GH, HUA, HLDG, ILL, JAUM, JBSD, K, L, MEDEL, MO, NY, P, PMA, SCZ, U, US, USJ, VEN, as well as detailed observations of living individuals in the field in Colombia, Costa Rica and Panamá (Supplementary material), we encountered significant differences in several characters; including the extent of the petiolar margins in leaves of the monopodium and sympodial branches, the number of primary veins or the degree of fusion of the central part of primary veins (which often results in leaves being pinnately nerved), the presence of leaves on sympodial branches, the type and distribution of trichomes in several parts of the plant, and the length of spikes when compared with the length of individual adult leaves. Here we recognized six species (see key below) and present evidence for the recognition of an additional taxonomic novelty, *Manekia betancurii*.

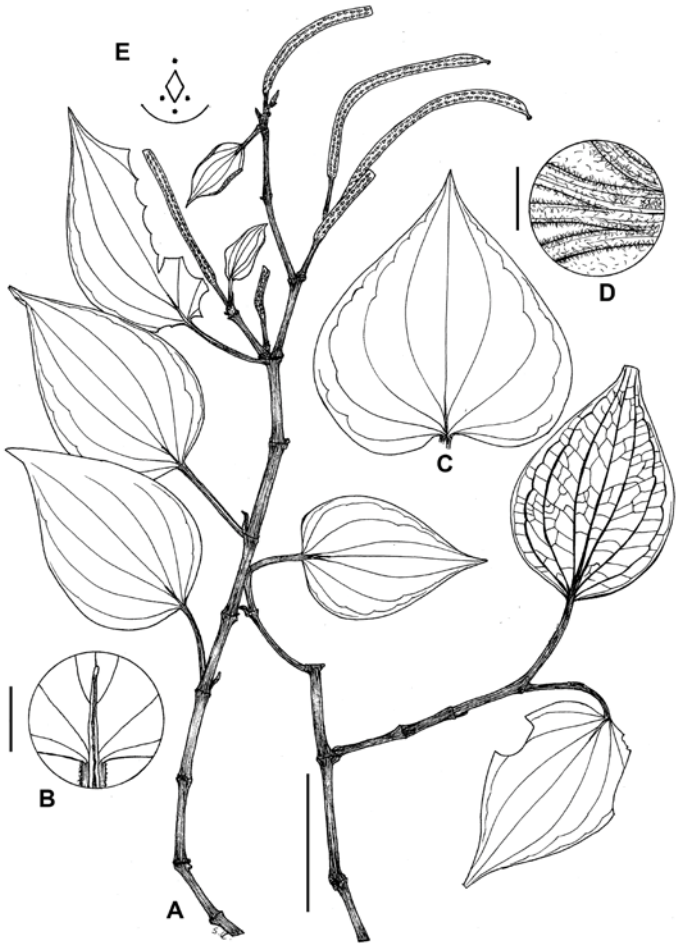

Figure 1. *Manekia betancurii*. **A**. General view of the plant and sympodial branches; scale bar equals 5 cm. **B**. Detail of petiolar margin above the leaf base; scale bar equals 5 mm. **C**. Leaf of monopodial axis. **D**. Detail of indumentum on lower surface of leaf; scale bar equals 3 mm. **E**. Floral diagram. All taken from Callejas et al. 2980, HUA.

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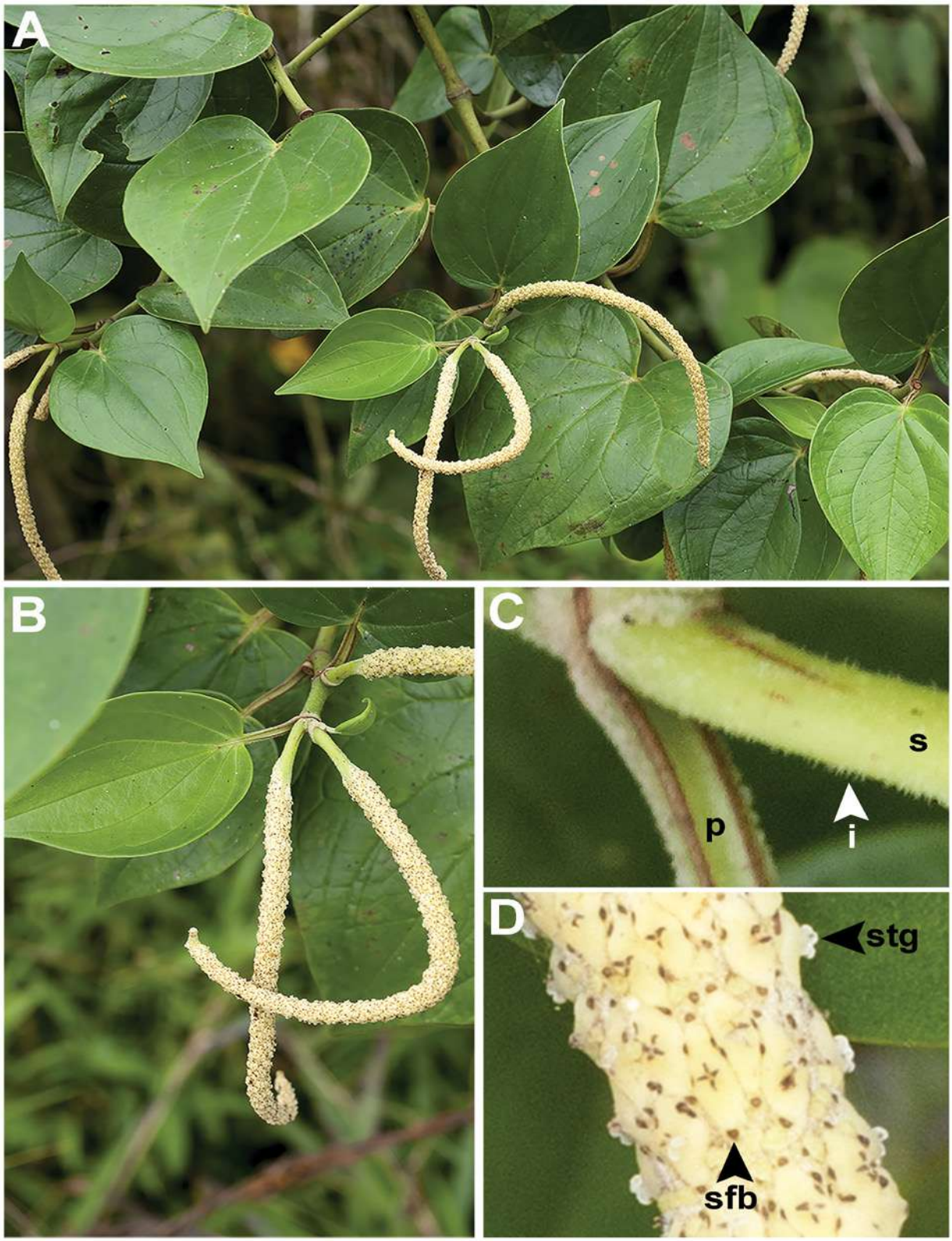

Figure 2. *Manekia betancurii*. **A**. General view of an individual plant. **B**. Close view of sympodial branches and the spikes. **C**. Detail of indumentum on stem. (i) indumentum, (p) petiole, (s) stem. **D**. Detail of spike in fruit. (sfb) scar of filament base, (stg) stigmata. Photos by Paola Pedraza and Julio Betancur, taken at the type locality in NW Colombia.

Manekia betancurii
Silva-Sierra and Callejas sp. nov. (figures 1, 2)

Type: Colombia: Antioquia, mun. Frontino, Las Orquídeas Natural National Park, road from Finca Guadulala to Alto de Carauta, 6°30'N–76°30'W, 1,020–1,750 m, 2 Dec 1986 (fl), *R. Callejas, F.J. Roldán, J. Betancur and O. Escobar 2980* (Holotype: HUA!; isotype: COL!).

A species distinct from others in the genus Manekia by the combination of the 7–9 pinnately nerved leaves from monopodial axis, the petiolar margins extending 0.2–0.8 mm above the leaf base, and the presence of trichomes on stems, leaf abaxial surface, petioles and peduncles.

Scandent lianas with stems 5–12 m long, densely branched, nodes strongly thickened, the nodes of monopodial axis and branches rooting, root scars 0.1 × 0.1 mm, black, prominent; internodes 2.5–5.2 × (-0.5) 0.1–0.3 cm, terete when living, terete to quadrangular when dry, densely pubescent, trichomes 0.1–0.2 × 0.1 mm, weak, flexuous, sub-erect, semirigid, fuliginous when dry, surface of the internodes smooth, orange punctate, the idioblasts rather dispersed on the surface, stems pale green when living, brownish to blackish when dry. Prophyllum (-0.1–0.3) 0.6–1.0 × 0.1 cm, densely pubescent, not punctuate, blackish and coriaceous when dry. Leaves variable in shape and size, those on the main axis and monopodial branches 8.4–10.5 × 6.4–8.7 cm (the most basal ones) or 4.1–5.5 × 1.9–3.2 cm (the most distal ones), those leaves on sympodial branches much smaller, 2.3–2.7 × 0.05–0.1 cm, ovate to elliptic in monopodial axis, elliptical, lanceolate in sympodial branches, almost symmetrical and equilateral at the base, those leaves on monopodial axis often obtuse, rounded to truncate or sub-lobate, the lobes when presents much shorter than the petioles, divergent, leaves on sympodial branches acute, short to long acuminate at the apex, pinnately nerved below the lower third portion of the leaf, with 3 (leaves on sympodial or flowering branches) to 4 pairs of secondary nerves in monopodial axis, the nerves almost equally spaced, the central pair more or less merged with the midnerve for nearly one centimeter, the most basal nerves in leaves from monopodial axis diverging in 70–90 degree angles, the most central ones in 30–45 degree angles, nerves in leaves from sympodial branches diverging in 35–40 degree angles, all nerves slightly curved and ascending, reaching the apex of the leaf blade, marginally anastomosed and forming prominent loops, nerves of third order mixed alternate and opposite percurrent, convex to sinuous, forming areoles 0.6–0.9 × 0.4–0.5 cm, (0.3–0.4 × 0.1–0.2 cm in leaves from sympodial branches) relatively consistent in form and size, oblique to perpendicular to the secondary nerves, nerves of fourth-order alternate percurrent (but scarcely visible in leaves on sympodial branches), nerves of fifth-order poorly developed, nerves evident and more or less impressed on the upper surface, elevated and often very prominent on the lower surface, glabrous above, densely pubescent below, the trichomes 0.1–0.2 mm long, weak, flexuous, adpressed on the nerves, sub-erect on the leaf surface, the upper surface not punctate, orange dotted below, the idioblasts widely spaced on the surface, slighty immersed in the epidermis, mostly elevated above it, thick membranaceus when living, thick to almost chartaceus and opaque when dry, green on both faces when living, brownish to blackish when dry; petiole (-0.7–1.4) 2.3–3.2 × (-0.06) 0.1–0.2 cm, smooth, densely pubescent, trichomes 0.1–0.2 × 0.1 mm, weak, flexuous, sub-erect, semirigid, covering finely the petiole, dark orange dotted with idioblasts dispersed on the surface, the petiolar margin 0.9–4.0 cm long, extended the entire length of the petiole, reaching 0.2–0.8 cm above the leaf base and leaving on it a prominent V-shaped scar, coriaceous, pale green when living, black to brownish when dry. Inflorescences restricted to short sympodial branches, those almost restricted to the apex of monopodial axis; the sympodial branches with very small leaves developed at each node, or not developed at all, with one to three internodes, holding one or two spikes, some spikes terminal, or axillary, spikes 7.2–9.5 (-12.2) × (-0.5) 0.2–0.3 cm, erect on flower, curved distally to almost pendulous in fruit, the apex obtuse, cream-white on flower, green on fruit when living, black to brownish when dry, the flowers not forming bands around the spike, the rachis densely pubescent, the trichomes 0.2–0.3 × 0.1 mm, weak, flexuous to semirigid, sub-erect, not dotted; floral bracts 0.5–0.6 × 0.5 mm, shell-shaped, fimbriate along the margins, pubescent towards the base, sub-sessile, the peduncle 0.8–1.4 cm long, smooth, densely pubescent, scarcely orange dotted, light green when living, brownish when dry. Flowers sessile, 4 staminate, anthers 0.3–0.4 × 0.2 mm, reniform, dehiscent longitudinally on an oblique plane, the connective scarcely protruding beyond the thecae, nod dotted, filaments scarcely developed. Pistils 4 carpellate. Berries 0.3–0.4 × 0.1 mm, oblong, sessile, acute at the apex, green when living, black when dry, glabrous, not dotted, partially to fully immersed in the rachis. Style absent, stigmas 3–4, laminar.

Etymology: The epithet honors Julio César Betancur Betancur, Colombian taxonomist, curator at the Herbario Nacional Colombiano (COL) from Instituto de Ciencias Naturales in Bogotá, a respected specialist on Bromeliaceae and Heliconiaceae, colleague, friend and a major plant collector of the Flora of Antioquia.

Distribution and Ecology: Manekia betancurii is known from two localities in the western slopes of the Western Cordillera in the municipality of Frontino in the department of Antioquia (figure 3), NW Colombia (Cauca Province, sensu Morrone 2014). From 800 to 1,750 m elevation. The species is apparently restricted to a few tracks of forests in the Las Orquídeas National Park, an area with dense cover of premontane, montane and very humid montane forests, and to the region known as Murrí south of Las Orquídeas National Park. The new species is found either in the interior of forests or along river or road banks, where branches often are pendulous and notorious by the white to greenish pendulous or distally curved hanging infructescences.

Fenology: Flowering Jul, Dec; fruiting Jul.

Paratypes: Colombia: Antioquia, mun. Frontino, La Blanquita, región of Murrí, road Nutibara–La Blanquita, 14.5 km W of Nutibara, 15–16 km from Alto de Cuevas-La Blanquita, 6°45'N–76°25'W,

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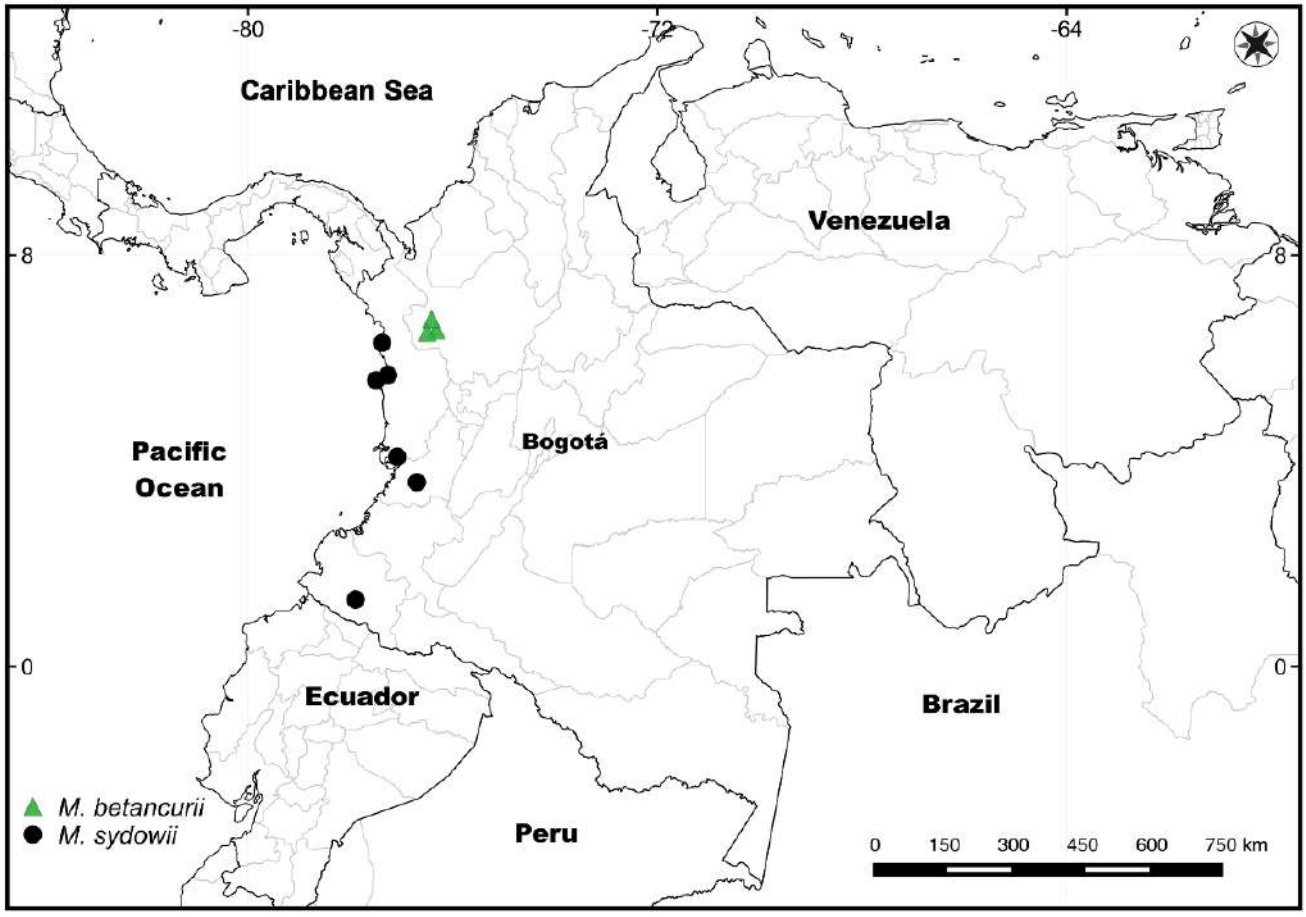

Figure 3. Distribution of *Manekia betancurii* (green triangles) and *Manekia sydowii* (black circles) in Colombia. This map was elaborated using Qgis (version 2.8.3-Wien).

890–900 m, 13 Jul 1988 (ft), R. Callejas, J. Betancur, A. L. Arbeláez and I. D. Castaño 6720 (HUA, MO); Las Orquídeas Natural National Park, Venados Abajo, farm of Gabriel Montoya, on the right margin of the Venados River, forest on the edge of the road, 6°32'23.5''N–76°19'9.7''W, 860–910 m, 23 Jul 2011 (fl), P. Pedraza-Peñalosa, J. Betancur, M.F. González, R. Arevalo, D. Sanín, A. Zuluaga, A. Duque and J. Serna 2284 (COL, CUVC, HUA, MO, NY, W).

Diagnostic characters and taxonomic relationships: *Manekia betancurii* may be recognized by the leaves of the monopodial axis which are basally obtuse, rounded, truncate to scarcely lobate, 9 pinnately nerved, while those of the sympodial branches are basally acute and 7 pinnately nerved, by the petiolar margins that reach into the leaf blade 0.2–0.8 cm, both in leaves from monopodial as well as from sympodial branches and by the densely pubescent stems, leaves (abaxially), petioles and peduncles. The extent of the petiolar margin on the leaf blade distinguishes this species further from *Sarcorhachis sydowii* var. *hirsuta* Yunck., a variety from SE Ecuador (likely a different species from *Manekia sydowii* (Trel.) T. Arias, Callejas and Bornst.) that exhibits sympodial branches with much longer inflorescences, 10–16 cm long, vs 7–9 cm long as in *M. betancurii*. Adult leaves of monopodial branches in *M. betancurii* are similar to those of *M. sydowii*, a species from NW Colombia and Ecuador, but with leaves that are often 9–11 pinnately nerved, with more robust sympodial branches and fully glabrous. Indumentum pubescent in *M. betancurii* is constant in collections from 800 m and those from 1,750 m, both in degree of coverage, length, and appearance.

Key for the species of *Manekia*

1. Plants from forests on limestone substrate, or karst, at low elevations (500–1,200 m). Plants from the Caribbean Islands.

2. Leaves palmately nerved, basally acute or rounded, the petiolar margin extending to 0.5 cm above the leaf base.....
M. urbani

2. Leaves pinnately nerved, basally lobate or rounded, the petiolar margin extending to 1.2 cm above the leaf base.....
M. incurva

1. Plants from forests on non-limestone substrates, from sea level to 2,000 m, montane, premontane or wet tropical forests. Plants from continental areas in Meso and South America.

3. Plants with trichomes on stems, petioles, peduncles and lower surface of leaves.

4. Petiolar margin extending 0.2–0.8 cm above the leaf base, leaves on monopodial branches 9 pinnately nerved, spikes 7–8 cm long……

M. betancurii

4. Petiolar margin extending to the base of the leaf, leaves on monopodial branches 9–11 pinnately nerved, spikes 10–16 cm long……..……

S. sydowii var. hirsuta

3. Plants glabrous on stems, petioles, peduncles and lower surface of leaves.

5. Leaves palmately nerved, basally truncated, rounded or lobate, apically obtuse or scarcely mucronate, the petiolar margin extending 2/3 the length of the petiole……...……

M. obtusa

5. Leaves pinnately nerved, petiolar margin extending above the leaf base.

6. Leaves not dotted, redounded to slightly lobate, basally obtuse, acuminate, the petiolar margin 0.6–1.2 cm, never reaching the point of divergence on the blade of the most central secondary nerves, inflorescences geminate……..……

M. venezuelana

6. Leaves orange or black dotted.

7. Leaves basally rounded, scarcely lobate, generally black dotted, 9 pinnately nerved, scar of petiolar margin reaching the divergence point of nerves secondary more centrals spikes 10–11 cm long, ovoid fruit……..……

M. naranjoana

7. Leaves basally truncate, rounded to lobate, generally orange dotted, 9 pinnately nerved, scar of petiolar margin almost reaching the divergence point of nerves secondary more centrals spikes 12–14 cm long, oblong fruit……..……

M. sydowii

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Supplementary material: Specimens examined of *Manekia* species.

I. *Manekia incurva* (Sieber ex Schult.) T. Arias, Callejas and Bornst.: *Novon* 16 (2): 206, 2006. *Piper incurvum* Sieber ex Schult., *Mantissa* 1: 238, 1822. *Artanthe martinicae Miq., Syst.* Piperac. 413. 1844. *Piper incurvum* Sieber ex C.DC., *Prodr*. 16 (1): 294, 1869. *Sarcorhachis incurva* (Sieber ex Schultes) Trelease, *Contr. U.S. Natl. Herb*. 26: 17, 1927. Type: Martinique, *F.W. Sieber 254* (Holotype: B, destroyed; isotype: BR!, G!, GH!, HAL!, ILL, MO, MPU!, P+2!, US; photo ex US at A+2); Martinique, *F.W. Sieber s.n*. (U!). Ilustration: H. *Stehlé*, Fl. Descript. Antilles Franç. 1940, t2, pag. 65-67, Pl. II.

Piper guadeloupense C. DC., *Annuaire Conserv. Jard. Bot. Genève* 2: 264, 1898. Type: Martinique, Piton de Champflore, Feb 1870 (fl), *L. Hahn* 1303 (Lectotype: G-DC!, P+2!). Syntype: (BM+2, G+3, GH!, NY, US; photo ex GH at A, US); Guadeloupe, 1 Jul 1873 (fl), *F. L'Herminier s.n*. (P); Dominica, 600 m, Jan 1882 (fl), *H.F.A. Eggers 664* (G+3, GH!, L!, P+3!, R!).

Sarcorhachis incurva (Sieber ex Schultes) Trel. var. stehlei Trel. ex Stehlé, *Bull. Soc. Bot. France* 83: 627. 1936. (nomen nudum); Fl. *Descr. Antilles Fr.* 2: 67, pl. 2. 1940; *Bull. Agric. Martinique* 9: 143, tab 2, 1940. Type: Guadeloupe, forêt de Bains Jaunes, 650 m, 16 Feb 1936 (fl), *H. Stehlé and M. Stehlé* 380 (Lectotype: NY; isotype: ILL, P+4!; photo ex ILL at A; per Jones, *Phytologia* 58: 99. 1985).

Sarcorhachis incurva (Sieber ex Schultes) Trel. var. *treleasii* Stehlé, *Bull. Agric. Martinique* 9: 143, 1940. Type: Guadeloupe, Chemin de Malanga, 650 m, 1 Jan 1937 (fl), *H. Stehlé and M. Stehlé 1677* (Holotype: NY, ILL [fragment]; photo ex ILL at A).

Sarcorhachis incurva (Sieber ex Schultes) Trel. var. *typica* Trel. ex Stehlé, Fl. *Descript. Antilles Franç*. 2: 66, 1940. nomen illeg. (same type that *Piper guadeloupense*). Type: Martinique, Piton de Champflore, Feb 1870 (fl), L. Hahn 1303 (BM+2, G+3, G-DC!, GH, NY, US; photo ex GH at A, US).

Representative specimens examined: Lesser Antilles: Est. Guadeloupe, mun. Matouba, in monte sulfuro, *s.d*. (st), *Duchassaing s.n.* (P); mun. ?, forêt des bains jaunes, 16 Aug 1936 (fl), *M. Stehlé* 995 (ILL, NY, P); mun. ?, forêt des bains jaunes, 2 Aug 1937 (fl), *H. Stehlé and M. Stehlé 1328* (ILL, P); mun. ?, forêt des bains jaunes, 27 Aug 1937 (fl), *H. Stehlé and M. Stehlé 2073* (ILL, NY, P); mun. ?, forêt des bains jaunes, 800 m, 21 Jun 1934 (ft), *L. Rodriguez 2451* (P); mun. ?, Parnasse, 3 Jan 1937 (fl), H. Stehlé and M. Stehlé 1366 (P); mun. ?, Parnasse, 18 Apr 1938 (ft), *A. Questel 1366* (P); mun. ?, Fournet, Morne à Louis, borde de route, 10 Jan 1988 (ft), s.c. 4298 (P); mun. ?, Chemin de la Soufrière, 1933 (fl), *L. Quentin* 728 (P); mun. ?, s.d. (st), *A. Questel s.n*. (P); mun. ?, s.d. (st), *A. Questel s.n.* (P); mun. ?, s.d. (fl), *L.C. Richard s.n*. (P). Est. Dominica, St. George, fresh Water Lake area, south face Micotrin, mossy forest, Bredin-Archbold-Smithsonian Biological Survey, 2400-2600 ft (731-790 m), 1 Jun 1967 (fl), *D.C. Washausen and* E.S. Ayensu 338 (ACC, B, US). Est. Martinique, mun. ?, Montagne Pelée, Base du Dôme, près de Montauberge, 700-800 m, 8 Jan 1979 (fl), *C. Sastre* 6517 (A, P); mun. ?, *Stehlé 4628* (P, US); mun. ?, *Stehlé 6018* (P, US); mun. ?, 1 Jan 1860 (fr), *C.P. Bélanger 971* (P, US); mun. ?, *s d*. (fl), *C.P. Bélanger 256* (P). Without known locality: Est. ? mun. ?, s.d, s.c. (P).

II. *Manekia naranjoana* (C. DC.) Callejas ex N. Zamora, Hammel and Grayum: *Monogr. Syst. Bot.Missouri Bot. Gard. 97: 121, 2004. Piper naranjoanum* C. DC., Linnaea 37: 363, 1872. Sarcorhachis naranjoana (C. DC.) Trel., *Contr. U.S. Natl. Herb.* 26: 17, 1927. Type: Costa Rica: Naranjo, in 1845–1848 (ft), *A.S. Oersted 878* (Holotype: C!; photo at F, GH, MO, US; isotype: C!, G-DC! [fragment]). Ilustration: *T.G. Yuncker,* Flora of Panama, Part IV, Fascicle 1. *Ann. Missouri Bot. Gard.*: 1950, 37 (2), pag. 74-75, Fig. 17. *W. Burger*, Flora

Costaricensis, Family # 41, Piperaceceae. *Fieldana Botany*: 1971, 35, pag.199-200, 204, Fig. 3.

Sarcorhachis anomala Trel., *Contr. U.S. Natl. Herb*. 26: 118, 1929. Type: Costa Rica: San José, La Hondura, 1300-1700 m, 16 Mar 1924 (fl), *P.C. Standley 37909*. *Piper terminalispicum* Standl., *Publ. Field Mus. Nat. Hist., Bot. Ser.* 18: 365. 1937. Nomen novum for *Sarcorhachis anomala* Trel. because *Piper anomalum* C. DC. block the name. (Holotype: US).

Representative specimens examined: Costa Rica: Prov. Alajuela, mun. San Ramón, bosque primario y secundario en el sendero de las cataratas, Río San Lorencito, 10°13'10''N – 84°35'35''W, 800-900 m, 28 Apr 1993 (fl), *J.F.Morales, F. Araya, H. Gutiérrez, R. Gúzman and M. Segura 1386* (CR, F, MO); no protegida, cuenca del Barranca, Bajo La Paz, a lo largo del río la Paz, c.a 5.5 km noroeste de Piedades del norte, 10°09'51''N – 84°32'56''W, 1165 m, 3 Jul 2005 (ft), *B. Hammel, H. Kennedy and I. Perez 23667* (CR, MO, USJ); no protegida, cuenca del San Carlos, Fortuna R. B. Arenal Mundo Aventura, 10°27'10''N – 84°39'30''W, 255-400 m, 15 May 2004 (ft), *A. Rodríguez 8922* (CR, MO, USJ); Reserva Biol. A.M. Brenes, camino de entrada a la estación, 10°13'15''N – 84°36'00''W, 850-900 m, 24 Apr 1993 (fl), *J. Gómez-Laurito, R. Ortiz and V. Mora 12441* (F, USJ); Reserva Forestal San Ramón, sendero Miramar, 10°12'53''N – 84°36'28'' W, 2 Nov 1986 (fl), *Ch.G. Herrera, V. Mora and D. Hernández 178* (BM, HUA, MO); Reserva Forestal San Ramón, en filas al noroeste de la estación, 10°12'53''N – 84°36'28''W, 3 May 1987 (ft), *Ch.G. Herrera 619* (BM, HUA, MO). Prov. Cartago, mun. Cantón de Paraíso, primary forest, middle slopes of Cerro Doán, 4 km E of Cachí, 1500 m, 17 Feb 1972 (ft), *R.W. Lent 2350* (RB, PMA U); hill-top, 2 km E of Cachí, 1450 m, 16 Dec 1972 (fl), *R.W. Lent 3120* (F, U); mun. ?, La Unión, San Rafael, Z.P., La carpintera, propiedad de campo Escuela Iztarú, bosque por canchas al sur del área administrativa, 09°53'13.4''N – 83°58'7.7''W, 1623 m, 26 Jul 2007 (fl), *A. Casccante and J. Solano 1784* (CR, USJ). Prov. Heredia, mun. Cantón de Sarapiquí, Finca La Selva, the OTS field station on the Río Puerto Viejo just E of its junction with the Río Sarapiquí, 100 m, 25 May 1980 (fl), *M. Grayum 2864* (DUKE, FDLS); OET La Selva, detrás de la cabina # 3, 14 Mar 2007 (fl, ft), *O. Vargas 1742* (FDLS); Parque Nac. Braulio Carrillo, puesto El Ceibo, gently sloping area just above the steep rim of the Río Peje gorge on the west side, alongside path that goes from guard house to water, 10°19'58''N – 84°04'44''W, 520 m, 9 Dec 1992 (st), B. Boyle 1435 (CR, HUA, MO); Parque Nac. Braulio Carrillo, Sendero del Transecto, inmediately to rigth of trail, one half hour below refugio, 10°16'38''N – 84°04'57''W, 1070 m, 22 Nov 1992 (st), *B. Boyle, T. Ely and S. Libenson 1186* (CR, HUA, MO). Prov. Limón, mun. Cantón de Pococi, llanura de Santa Clara, unión del Río Corinto con quebrada Molinete, 10°11'55''N – 83°53'30''W, 250 m, 1 Feb 1996 (fl, ft), *B. Hammel, J. González and T. Bermúdez 20143* (CR, MO); llanura de Santa Clara, Finca La Suerte, 10°26'30''N – 83°47'20''W, 50 m, 10 Jul 1995 (fl), *R. Aguilar and K. Keefe 4203* (CR, HUA, MO); mun. Guyacán, Los Angeles de Siquirres 3 km W and 1.9 km S from Guayacán, highway to Limón, 1000 m, 6 May 1983 (fl), *L.D. Gómez, R. Liesner and E. Judziewicz 20553* (BM, CR, HUA, WIS); mun. Cantón de Talamanca, Bratsi, Amubri, Alto Lari, Kivut, fila mayor entre los Ríos Dapari y Lari, desviándose hacia el este por fila secundaria, cuenca del Río Lari, 09°23'50''N – 83°05'10''W, 1350 m, 17 Mar 1992 (ft), *G. Herrera 5382* (CR, HUA, MO); Cerro Coronel, E of Laguna Danto, tall evergreen forest on moderatly steep slopes, 10°41'N – 83°38'W, 80-120 m, 14 Mar 1987 (ft), *W.D. Stevens, G. Herrera and O.M. Montiel 24805* (HUA, MO). Prov. Puntarenas, finca Las Alturas, road to the biological station, montane forest, 1400-1500 m, 17 Feb 1991 (ft), F. *Almeda, T.F. Daniel and B. Bartholomew 6679* (F); mun. Cantón de Coto Brus, Distrito Sabalito, Finca Las Alturas del Bosque verde, vegetación a lo largo del camino entre la entrada principal y el pueblo Las Alturas, 8°54'35.92''N – 82°50'41.52''W, 1320 m, 18 Aug 2015 (fl), *F. Oviedo-Brenes and R. Quirós 3553* (HLDG); vegetación remanente a orillas del camino que comunica la entrada principal con el pueblo Las Alturas, 8°55'16.5''N – 82°50'26.9''W, 1299 m, 11 Aug 2015 (fl, ft), *F. Oviedo-Brenes, R. Quirós, D. Silva and P. Juarez 3514* (HLDG); Jardín Wilson, camino al Río Java, 8°47'2''N – 82°57'37''W, 1130 m, 19 Jun 2007 (st), *R. Moran and M.A. Quijano 8056* (HLDG, USJ); Estación Biológica Las Cruces, bosque cerca del borde del potrero, claro formado por la caída de muchos árboles, sotobosque inexistente, pendiente suave, cobertura prácticamente nula, 8°47'0.2''N – 82°58'33.2''W, 1350 m, 10 Jul 2008 (ft), *F. Oviedo-Brenes 87* (HLDG); unos 250 m antes del final del Sendero Ridge, bosque maduro, 8°47'05''N – 82°58'31.6''W, 1137 m, 10 Aug 2015 (ft), F. *Oviedo-Brenes, D. Silva and P. Juarez 3489* (HLDG); sendero Loop, bosque maduro, vegetación a orilla de quebrada, 8°47'14''N, 82°57'59''W, 1150 m, 10 Aug 2015 (fl, ft), *F. Oviedo-Brenes, D. Silva and P. Juarez 3506* (HLDG); Distrito de Limoncito, Cerro Paraguas, 08°47'21.18''N – 83°01'59.99''W, 1550 m, 2 Jul 2015 (fl), *D. Silva, P. Juarez, V. Ramirez and Grupo de Sistemática de Plantas Tropicales 2015-18* (CR); P. I. La Amistad, Cordillera Talamanca, Estación Pittier, frente al portón de la entrada del parque, potrero, 09°01'30''N – 82°57'40''W, 1680 m, 15 Jun 1995 (ft), *L. Angulo 379* (CR, HUA, MO); Monteverde, upper community pastures and forest patches, lower montane wet forest, 10°20'N – 84°50'W, 1500 m, 24 Dec 1985 (ft), *W.A. Haber 3909-3910* (BM, COL, MO, WIS). Prov. San José, cotas Acosta-Aserrí, Tiquirres, quebrada, Ayaralis, fila Ayarales, 9°52'N – 84°09'W, 800-100 m, 9 Jul 2003 (st), *R. Callejas and F. Morales 13234* (HUA). Panama: Prov. Bocas del Toro, mun. Distrito de Changuinola, a la orilla de la quebrada Bonyic, alrededores de Rancho Quemado, 09°20'02''N – 82°37'20''W, 26 Sep 2007 (ft), *F. Hernández, R. Carranza, C. Galdames and A. Pérez 625* (PMA, SCZ); PILA, edge of pasture and forest steep slope, wet forest, trees to 25 m, duh 20-60 cm, pasture with a few relict trees, 09°03'619''N – 82°42'992''W, 1500 m, 18 Apr 2008 (ft), *A.K. Monro, D. Santamaría and J. Lezcano 5982* (BM, CR, PMA). Prov. Chiriquí, mun. Bugaba, Las Lagunas area W of El Hato del Volcán, woods, 08°47'N – 82°40'W, 1400 m, 23 Aug 1982 (ft), *C. Halmilton, H. Stockweel and A. Aiello 938* (BM, HUA, MO, PMA); Ojo de Agua, property of Ratidon Hartmann, vicinity of Santa Clara, between Volcán and Río Sereno, forest with clerarings and unpaved road, 08°51'N – 82°45'W, 1520 m, 17 Jun 1987 (ft), T.*B. Croat 66300* (BM, HUA, MO, PMA). Prov. Coclé, mun. ?, P. N. Omar Torrijos, Cerro el Cope, Bosque aledaño al centro de visitantes, 800 m, 30 Oct 2007 (st), *M.A. Jaramillo, M. Quijano-Abril and J. Aranda 1046* (HUA); New Works at Aseradera Rivera, Alto Calvario, 7 Km N

of El Cope, medium to tall montane forest, 700 m, 2 Apr 1977 (fl), *J.P. Folsom and R. Robinson 2366* (MO, PMA). Prov. Panamá, mun. ?, Parque Nacional Altos de Campana, Comunidad Trinidad, en las faldas del cerro Tinidad, 26 Feb 2002 (st), *R. Aizzprúa and N. Flores B3212* (PMA, SCZ). Prov. San Blas, mun. Nusgandi, El Llano-Cartí road, 19.1 km from Interamerican Hwy, 9°19'N – 78°55'W, 350 m, 6 Nov 1984 (fl, ft), *G. Nevers 4198* (BM, HUA, MO).

III. *Manekia obtusa* (Miq.) T. Arias, Callejas and Bornst.: Novon 16 (2): 206, 2006. *Artanthe obtusa Miquel, Syst. Piperac.* 416. 1843 [1844]. *Piper fluminense* C. DC., *Prodr. Syst. Reg. Veg.* 16 (1): 308, 1869. *Sarcorhachis obtusa* (Miq.) Trel., *Contr. U.S. Natl. Herb.* 26: 118. 1929. Type: Brazil: in the south of Brazil, *s.d.* (ft), *Sellow s.n.* (Holotype: B, destroyed); *Sellow 173* (Drawing at G-DC!). Ilustration: *A.F.W. Shimper,* Botanische Mittheilungen aus den Tropen. Jena: Fischer, 1888 – 1901, Vol. II, pag. 96-97, Taf. I Fig. 2a, 2b. *D. Monteiro and E.F. Guimaraes*, Flora do Parque Nacional do Itatiaia – Brasil: *Manekia e Piper* (Piperaceae). Rodriguésia: 2009, 60 (4), pag. 1003-1004, Fig. 1a-e.

Piper convallariodorum C. DC., *Bull. Herb. Boiss. ser.* 2 (1): 356, 1901. *Sarcorhachis convallariodorum* (C. DC.) Steyermark, *Pittiera* 3: 32, 1971. Type: Brasil, Serra Ouro Preto, in locis umbrosis ad rivulos, 1050 m, 7 Jan 1894 (fl), *C.A.W. Schwacke 10227* (Holotype: G, G-DC!, P, photo at GH, US).

Sarcorhachis obtusa (Miq.) Trel. var. *cordata* Yuncker, *Bol. Inst. Bot. (São Paulo)* 3: 134, fig. 117, 1966. Type: Brasil, Paraná: Jacarei, 14 Aug 1914 (ft), *I. G. Jönsson 862a* (Holotype: S, ILL [fragment]; isotype: LE, US).

Representative specimens examined: Brazil: Est. Minas Gerais, mun. Lima Duarte, 10 Mar 1994 (ft), *VC. Almeida 17* (RB). Est. Espírito Santo, mun. Santa Teresa, Vila Nova, terreno do Gino, 640 m, 11 Mar 2001 (ft), *L. Kuhllmann 3601* (MBML, RB). Est. São Paulo, mun. Caraguatuba, Parque Estadual da Serra do Mar, estrada intermeiária, km 33, próximo à estação de bombeamento da Petrobrás, 23°40'58''S – 45°38'13.8''W, 18 Apr 2000 (fr), *J.P. Souza, A. Zidko, CG. Mendonça, V.R. Baptista, L. Ferreira, Fo.R. Cielo, R.R. Rodrigues, V.C. Souza and J.Y. Tamashiro 3244* (RB, SP); estrada para Caraguatuba, 19 Sep 1973 (ft), *Sucre D. et al. 10226* (RB); mun. Iporanga, Núcleo Bulha D'água Trilha da caverna do Sr. Bento, 24°20'18.2''S – 48°29'58.2''W, 21 May 2003 (fl), *C. Urbanetz, G.F.G. Déstro, I.R. Moreira-Coneglian, I.C.F. Harder, M.R.A. Muniz, J. Paula-Souza, V.C. Souza, R.R. Rodrigues and J.Y. Tamashiro 126* (ESA, RB). mun. Lorena, piquete, 2 Jun 1950 (fl), *M. Kuhlmann 2371* (NY, RB, SP); mun. Ubatuba, Picinguaba, estrada da Casa da Farinha, 9 Oct 1989 (ft), *J.E.S. Ribeiro 753* (HRCB, RB); trilha da Casa da Farinha, 12 Oct 2001 (ft), *R.G. Udulutch, A.P. Savassi, A. Furlan, O. César and Turma do 2° ano do curso de Ciências Biólogicas Noturno 449* (HRCB, RB); mun. Pinhal, Fazenda Santa Teresa, 14 Nov 1947 (fr), *H. Kuhlmann 1548* (NY, RB, SP); mun. Sete Barras, Parque Intervales-Base Saibadela, trilha do rio, após o rio Saibadela, 16 Nov 2000 (fl), *V.B. Zipparro 2045* (HRCB, RB); mun. ?, Serra de Caracol, 5 Mar 1874 (ft), *C.W.H. Mosén 1690* (ILL, NY, P). Est. Rio de Janeiro, mun. Itatiaia, Parque Nacional de Itatiaia, caminho para pontedo Maromba, numa, árvore a margem da estrada, 2 Dec 2006 (fl), *D. Monteiro and A.C. Gieerine 225* (NY, RB); lado direito da ponte do Rio Taquaral, em direção ao Centro de Visitantes, 18 Mar 2006 (fr), *D. Monteiro, T. Carrijo, M. Vianna and E. Andrade 156* (RB); mun. Macaé, estrada Gliceri-Trajano de Morais, 5 May 2005 (st), *M. Carvalho-Silva, R. Marquete, C. Valente and N. Marquete 372* (RB); Distrito de Santo Aleixo, Bairro do Pico, Serra dos Órgãos, Área de Proteção Ambiental de Petrópolis, Vale do Rio do Pico, Rua Capitão Antero, trilha que sai desta rua e passa pelos fundos do Clube do Banrisul, trilha Rio do Pico, córego do Sossego, 10 Jan 2009 (fl), *E.A. Ribeiro 71* (RB); mun. Paraty, Subindo o Rio Corisquinho, 240 m, 11 May 1994 (fl), *R. Marquete 1782* (RB, SEMO); Mo do Curalinho, 580 m, 18 Apr 1994 (st), *R. Marquete 1677* (RB); estrada Paraty-Cuhna, 13-15 km da entrada de Paraty, 11 Oct 2004 (fr), *M. Carvalho-Silva, R. Marquete, M.A.M. Azevedo, C. Valente and N. Marquete 324* (MBM, RB, SPC); morro do Corisquinho, 10 Mar 1994 (fr), *A.P.S. Ribeiro, R. Marquete, M.C. Marques, S.B. Costa, M.D. Campo et al. 17* (RB, SEMO); mun. Petrópolis, Vale das Videiras, morro da Cuca, 1500 m, 17 Dec 1973 (fl), *G. Martinelli 141* (HAMAB, K, NY, RB, SEMO); mun. Resende, Visconde de Mauá, estrada Mauá-Resende, 22°20'07.6''S – 44°32'32''W, 1055 m, 7 Dec 2006 (fl), *V.F. Mansano and R. Marquete 06-354* (RB, SEMO); mun. Teresópolis, Parque Nacional da Serra dos Órgãos, Parnasco, Cascata do Amores, inicio da trilha, 22°25'56''S – 42°59'52'' W, 1078 m, 20 Mar 2012 (fr), *D. Monteiro, B.C. Bandeira, J.F.A. Baunatz, L.F. Gonçalves, L.S. B. Jordão and T.E.C. Meneguzzo 650* (NY, RB). Est. Paraná, mun. Antonina, faisqueira, 14 Nov 1980 (ft), *G. Hatshbach 43227* (MO); mun. Cerro Azul, Cab Rib. do Tigre, 1 Dec 1983 (fl), *Hatshbach 47663* (HUA, CURIT); estrada rio Branco do Sul-Cerro Azul, 5 km despois do Rio Piedade, mata dominada por Araucaria angustifolia, solo humedo, anegado, 25°15'S – 48°45'W, 6 Dec 1983 (st), *R. Callejas, J.M. da Silva and C. Ramos 1856* (HUA, NY); mun. Cerro Azul, Turvo, 11 Feb 1950 (ft), *G. Hatshbach 6743* (L); mun. Guaraqueçaba, Rio do Cedro, 20-50 m, 21 Nov 1968 (fl), *G. Hatshbach 20367* (L); mun. Morretes, colônia Limeira, 8 Nov 2007 (fl), *J.M. Silva, J. Cordeiro and C.B. Poliquesi 6140* (CURIT, RB). Est. Santa Catarina, mun. Blumenau, Área Virgem do Parque Nacional da Serra do Itajaí, 27°05'49.26''S – 48°08'21.67'' W, 660 m, 23 Nov 2009 (fl), T.*J. Cadorin, S.M. Cleme and C.P.L. Oliveira 680* (FURB, RB); mun. Florianópolis, Morro da Lagoa, 27°34'36.00''S – 48°28'32.00''W, 444 m, 23 Feb 2010 (fr), *T.J. Cadorin, B. Grosch, R. Zimmermann and C.P. Lopes 1223* (FURB, RB); mun. Itaiópolis, rodovia Indaial-Itaiópolis, próximo a Bomsucesso, 21 Aug 1994 (ft), *G. Hatschbach and Poliquesi 60976* (C, CURIT, HUA); mun. Jacinto Machado, Fundão do Tigre Preto, 3 Apr 1980 (fr), *Waechter 1583* (RB); Sanga da Areia, 200 m, 30 Oct 1959 (fr), *Reitz and Klein 4141* (B, F, G, K, L, NY, US); mun. Pouso Redondo, Alto Pombinhas, 27°16'14.00''S – 50°02'30.00''W, 475 m, 7 May 2010 (fl), *A. Korte and Kniess 3151* (FURB, RB); mun. Taió, Fazenda Tarumã, 27°00'01.06''S – 50°07'46.01''W, 812 m, 24 Feb 2010 (fr), *J.L. Schmitt, E. Caglioni, S. Andrade and C. Cristofolini 1534* (FURB, RB). Est. ?, Sierra do Ariro, 23 Jun 1868 (st), *A. Glaziou 2707* (P). Without known locality: Est.?, mun. ?, *s.d.* (fl, ft), Riedel *s.n.* (P). Without collector, Est. ?, mun. ?, *s.d.* (fl, ft), s.c. (RB).

IV. *Manekia sydowii* (Trel.) T. Arias, Callejas and Bornst.: *Novon* 16 (2): 206, 2006. *Sarcorhachis sydowii Trelease, Repert. Spec. Nov. Regni Veg.* 48: 16. 1940. Type: Ecuador: Prov. Pichincha, prope Mindo, 1,000-1,200 m, 6 Nov 1937 (st), *H. Sydow 317* (Lectotype: US!; isotype: US!)

Representative specimens examined: Colombia: Depto. Chocó, Mecana, 14 Ene 1984 (st), *A. Juncosa 1926* (JAUM, MO, NY); mun. Nuquí, corregimiento de Arusí, estación biológica El Amargal, 5°34'N – 77°30'W, 50 m, 27 Mar-17 Abr 1995 (st), *S. Suárez, G. Galeano, E. Ayazo and L. Garcia 811* (COL); corregimiento de Arusí, estación biológica El Amargal, bosque primario, 80 m, Feb 1992 (st), *M. Pardo, J. Cediel and G. Galeano 134* (COL); quebrada chaquí, 5°40'N – 77°16'W, 200 m, Feb-Mar 1994 (st), *G. Galeano, J. Grueso, O. Hurtado and L. Perea 4792* (COL). Depto. Valle del Cauca, mun. Buenaventura, Río Calima, entre La Trojita y Guadualito, 0-5 m, 11 Mar 1994 (fl), *J. Cuatrecuasas 16850* (COL, F, U, US); old rd. Cali-Buenaventura, ca. 2-13 km N of Anchicaya, 03°35'N – 76°42'W, 300-490 m, 9 May 1984 (ft), *J.L. Luteyn, R. Callejas and J.J. Pipoly 10372* (COL, G, JAUM, MO, NY, US). Depto: Nariño, mun. Ricaurte, resguargo indígena Gualcalá, Santa Fé, camino al río Guacalá, 01°18'N – 77°54'W, 1100-1200 m, 18 Dec 1995 (ft), *B.R. Ramírez and M.S. González 9169* (HUA, PSO). Ecuador: Prov. Carchi, prominent hillcrest directly N of Lita, on N side rio Mira and just to E of rio Baboso, primary premontane pluvial forest, on steep w-facing slope, 00°53' N –78°27'W, 760 m, 1 Jul 1994 (st), *B. Boyle and A. Boyle 3268* (HUA, MO). Prov. Esmeraldas, mun. Quininde, Bilsa biological station, montañas de Mache, 35 km W of Quinindé, 5 km W of Santa Isabel, old mono road past Sr. Rios' house, premontane wet forest, 00°21'N – 79°44'W, 400-600 m, 11 Nov 1994 (fl), *M.S. Bass and N. Pitman 229* (HUA, MO, QCNE); Bilsa biological station, montañas de Mache, 35 km W of Quinindé, 5 km W of Santa Isabel, old mono road, 5 km southwest of reserve, 0°21'N – 79°44'W, 400-600 m, 17 Nov 1994 (fl), *J.L. Clark and S. Mora 264* (COL, HUA, MO, QCNE). Prov. Morona-Santiago, mun.?, Pachicutza, at Escuela Fiscomisional Cardinal Döpfner, km 140 on road Loja-Gualaquiza, tropicalrain forest with cleared areas along rio Zamora and along the road, 03°34'S –78°34'W, 900-1000 m, *s.d., L. Holm-Nielsen, S. Jeppsen, B. Løjtnant and B. Øllgaard 4475* (AAU, HUA, S). Prov. Pichincha, vicinity of Santo Domingo de los colorados, near Hacienda Gloria Maria, 18 Jun 1955 (ft), *E. Asplund 16400* (ACC, B, F, HUA, NY, S); 20 km of Santo Domingo de los colorados, 1000 m, 20 Dic 1961 (ft), *P.C.D. Cazalet and Pennington 5098* (ACC, B, F, K, NY, US). Prov. Napo, mun. Cantón El Chaco, codo Sinclair, bosque húmedo tropical, bosque primario en el valle del Río Quijos, suelo con enormer rocas superficiales, 00°08'S – 77°27'W, 650 m, 16-20 Sep 1990 (ft), *W. Palacions 5648* (HUA, MO); mun. Orellana, Parque Nacional Yasuní, carrtera y oleoducto de Maxus construcción, km 46-52, bosque húmedo tropical, bosque primario, colinas de suelo rojo, 00°47'S – 76°30'W, 250 m, 1-11 Sep 1993 (ft), *M. Aulestia, C. Aulestica and J. Andi 457* (HUA, MO, QCNE); Río Wai si ayá, a nothern tributary to Río Aguarico, 1.5 km up the river on a small path going in the direction SE, partly inundated disturbed primary forest, 00°15'S – 76°21W, 300 m, 8 Aug 1980 (fl), *J. Branbyge, E. C. Azansa, P. Kelly and K. Bryan 32648* (AAU, HUA, QCA, QNA); San Pablo de los Secoyas, cleared primary forest with cattle grazing just opposite the village, 00°15'S – 76°21W, 300 m, 11 Aug 1981 (fl), *J. Branbyge, E.C. Azansa, L. Werling and S. Leth-Nissen 33464* (AAU, HUA, QCA, QNA); mun. ?, Guamanyacu, road Coca (Puerto Francisco de Orellana) – Lago Agrio, ca 40 km north east of Coca, 18 Nov 1973 (fl), *L.S. Holguer 3426* (GB, HUA); Las Sachas, road Coca (Puerto Francisco de Orellana) – Lago Agrio, ca 40 km north east of Coca, 13 Nov 1973 (fl), *L.S. Holguer 3394* (GB, HUA). Prov. Pastaza, mun. Cantón Pastaza, Pozo petrolero "Corrientes" de UNOCAL, 35 km al sur-sureste de Curaray, bosque húmedo tropical, bosque primario, árboles cortados por las obras petroleras, 01°43'S – 76°49'W, 300 m, 1-13 Sep 1990 (ft), *E. Gudiño 691* (HUA, MO); mun. Puyo, comunidad de Santa Cecilia, villano, bosque húmedo tropical, bosque primario, suelo con capa de materia orgánica de hasta 40 cm de profundidad, bien drenado, 01°30'S – 77°27'W, 380 m, 1 May 1992 (st), *W. Palacios 10105* (HUA, MO, QCNE). Prov. Zamora-Chinchipe, mun. Nangaritza Cantón, Rio Nangaritza valley, forest near Shaime, transect # 1, 04°18'S – 78°40'W, 930 m, 31 Jul 1993 (st), *A. Gentry 80808* (F, MO);10 km S of Zamora on road along left of río Jamboé, disturbed primary forest, 1100 m, 12 Apr 1985 (fl, st), *G. Harling and L. Andersson 24050* (GB, HUA, QCA); km 54 steep clavey slopes with scattered shurb-vegetation and dense herb-cover, 04°02'S – 78°59'W, 1300 m, 18 Apr 1973, *L. Holm-Nielsen, S. Jeppsen, B. Løjtnant and B. Øllgaard 3786* (AAU, COL, F, HUA, MO, NY, S). Peru: Depto. Loreto, prov. Maynas, mun. ?, Región de Amazonas, Dtto. Las Amazonas, explorando Camp. Inventario MacArthur, cerca de Sucusari, a lo largo del río Napo, bosque primario en terra firme, Parcela A, 03°20'S – 72°55'W, 100-140 m, 21 Feb 1991 (fl), *J. Pipoly, R. Vásquez, N. Jaramillo, C. Grandez, J. Ruíz and R. Ortíz 13183* (HUA, MO). Depto. Amazonas, prov. Bagua, mun. Imaza, Región nororiental del Marañon, comunidad de Yamayakat, río Marañon , bosque transcional, 04°55'S – 78°19'W, 320 m, *s.d., R. Vasquez, R. Ortiz-Gentry, N. Jaramillo and R. Apanu 18648* (HUA, MO); prov. Condorcanqui, Cordillera del Condor, puesto de vigilancia Alfonso Ugarte, PV3, cabeceras del río Comainas, tributario al oeste río Cenepa, valle abajo del campamento, borde quebrada rocosa, bosque perturbado y abierto, 03°54.8'S – 78°25.5'W, 1100 m, 19 Jul 1994 (fl), *H. Beltran and R. Foster 1052* (F, USM). Depto. Pasco, prov. ?, mun. Oxapampa, distrito Palcazú, comonidad nativa Alto Lagarto, bosque primario, 10°11'57''S – 75°21'23''W, 700 m, 11 Aug 2007 (ft), *R. Rojas, G. Ortiz, G. Castillo and E. Fernandez 4520* (HUA, MO).

V. *Manekia urbani* Trel.: *Repert. Spec. Nov. Regni Veg.* 23: 313, 1927. Type: Haiti: La Hotte, Morne Vandervelde, 700 m, 2 Dec 1925 (fl), *E.L. Ekman 5242* (Holotype: S!; isotype ILL).

Representative specimens examined: Haiti: Reg. Massif de la Hotte, Depto. Sud-Grand Anse límite, zona rural 'Geffrard', 18 km Norte de Camp Perrin, en la carrtera a Beaumont y Jérémie, antes bosque nublado y latifoliado con helechos arborescentes y palma *Calyptrogyne sp*. ahora destruido, roca caliza, 18°22'N – 73°53'W, 850 m, 11 Mar 1983 (ft), *T. Zanoni, M. Megía and J. Pimentel 25681* (JBSD, NY). Depto. Sur, Bois Cavalier, al Sur-Oeste de Kay Michel, bosque secundario en regeneración muy avanzada, zona

muy húmeda, 18°19'31''N – 74°01'21''W, 1120 m, 2 Feb 2006 (ft), *B. Peguero, J.V. Hilaire, T. Clase, R. Bastardo and E. Fernández 3559* (HUA, JBSD).

VI. ***Manekia venezuelana*** **(Steyerm.) T. Arias, Callejas and Bornst.**: Novon 16 (2): 207, 2006. *Sarcorhachis venezuelana* Steyerm., *Pittieria* 3: 33-34, 1971. Type: Venezuela: Carabobo: selva siempre verde a lo largo del Río San Gián, al sur de Borburata, arriba de la Planta Eléctrica, entre Los Tanques y La Toma, 750 m, 27-28 Mar 1966 (fl), *J.A. Steyermark and C. Steyermark 95152* (Holotype: VEN!; isotype: S!, US). Ilustration: *J.A. Steyermark*, Notes of Genus *Sarcorhachis* Trel. (Piperaceae). *Pittieria:* 1971, 3, pag. 29-38, Fig. 1.

Representative specimens examined: Venezuela: Est. Anzoátegui, mun. ?, along Río Zumbador and tributary, near base of Piedra Blanca, northeast of Bergantín, 800-1000 m, 1-2 Mar 1945 (st), *J.A. Steyermark 61301* (F, VEN). Est. Falcon, mun. ?, Sierra de San Luis, selva nublada, vecindad del Hotel Parador, al sur de La Tabla, 1450 m, 16 Jul 1967 (st), *J.A. Steyermark 98896* (ACC, B, F, VEN). Est. Lara, mun. Distrito Palavecino, laderas pendientes mirando al sureste en la quebrada de La Toma, en la Loma Redonda, al sur de Terepaima, 25 kms al sur de Cabudare, 1100-1200 m, 4 Aug 1970 (st), *J.A. Steyermark, F. Delascio, G.C.K. and E. Dunsterville 103357* (US, VEN); mun. ?, Sanare, 1500 m, Aug 1959 (st), *L. Aristeguieta 3949* (NY, VEN). Est. Monagas, mun. ?, south-facing forested slopes above limestone bluffs, northeast of Guácharo, 1300-1400 m, 11 Apr 1945 (st), *J.A. Steyermark 61997* (F, NY, VEN). Est. Sucre, mun. Distrito Federal, virgin wet forest on slopes along old road between 'Portachuelo' and 'Peñita', Petaquire and Carayaca, between Colonia Tovar-Junquito road and Hacienda El Limon, 6-8 mi. below junction of Junquito-Colonia Tovar road, 1300-1500, 24 Jun 1966 (ft), *J.A. Steyermark and L. Jr. Nevling 95929* (F, U, VEN); mun. ?, Peninsula de Paria, Cerro de humo, laderas de bosque húmedo nublado que miran al sur, entre la Laguna y Roma, noroeste de Irapa, 900-1060 m, 4 Mar 1966 (st), *J.A. Steyermark 95007* (F, US, VEN). Est. Trujillo, mun. Boconó, Parque Nacional Guaramacal, sector occidental, Qda Honda, parcela de estudio fitosociológico 21, 1880 m, Feb 1994 (st), *N. Cuello, B. Stergios, P. Marvéz and A. Henriquez 2144* (HUA); selva nublada, alrededores de un pantano grande entre Boconó y El Batatal, 1800 m, 5 Sep 1966 (st), *J.A Steyermark and M. Rabe 97369* (U, US, VEN). Est. Yaracuy, mun. ?, Cerro La Chapa, al norte de Nirgua, 1200-1400 m, 9-10 Nov 1967 (st), *J.A. Steyermark, G. Bunting and G. Wessels-Boer 100224* (AAC, B, VEN); mun. Distrito de Nirgua y Distrito de San Felipe, Serranía Santa María-Cerro La Chapa, en la cumbre, al este de la pica Nirgua-Las Marías, en selva nublada con Iriartea fusca (Karst.) Drude, abundante como palma emergente, 'refugio Nirgua', según Steyermark 1979, 10°12.5'N – 68°33'W, 1150-1350 m, 30-31 Dec 1992 (fl), *W. Meier 3289* (VEN).

VII. ***Sarcorhachis sydowii*** **Trelease** ***var. hirsuta*** **Yuncker:** *Ann. Missouri Bot. Gard* 53(3): 380. 1966. Type: Ecuador. Prov. Zamora–Chinchipe: Zamora, rd. from Loja to Zamora, km 45-51, 1,400-1,600 m, 20 Nov 1961 (ft), *C.H. Dodson and L.B. Thien 1423* (Holotype: MO; isotype: NY!)