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Autor: Schroeder, Laura J.
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DATA OF CERTAIN AMERICAN PIPERACEAE

BY

LAURA J. SCHROEDER

In the *Clavis Piperacearum* of Casimir de Candolle, published posthumously in volume one of the journal *Candollea*, there were a number of species which were without indication of the type locality or the type collection. In the succeeding volume of *Candollea*, Dr. Briquet supplied this deficiency for a considerable number of species; but he indicated (pp. 187-188) a certain number of others for which these data had not been obtained. The author was able to trace the types of all except three of the American Peperomias and all of the North American Pipers, and these are accounted for in the following pages. As was done in Dr. Briquet's article, extended descriptions have been furnished for some species, which supplement the scattered characters in the *Clavis*. A few typographical errors in the publication of *Candollea* which have been rectified are also included.

The writer is very greatly indebted to Professor William Trelease of the University of Illinois for the use of his manuscripts and for his personal supervision and help in the collection of the data included in this paper.

PEPEROMIA

Peperomia acrostigma C. DC., *Candollea*. I: 324. 1923 is *P. astrostigma* C. DC., *Bull. Coll. Hawaii*. I. 30. 1913.

Peperomia allagotacta C. DC., *Candollea*. I: 317. 1923.

A rather small erect somewhat branched essentially glabrous herb; stem slender (1 mm.), leafless below; leaves alternate below, those of the branches congested, lance-elliptic, obtuse, attenuate at base, rather small (7×20 mm., or on the main stem 1.5×3-4 cm.), 5-nerved with the laterals from slightly above the base, minutely ciliate, paler and pale-granular beneath; petiole very short (2 or on the lower *Candollea* III, Septembre 1926.

leaves 5 mm.) ; spikes terminal, small (1×10 mm.), closely flowered ; peduncle about as long as the spike ; bracts round-peltate, large (nearly 1 mm.) ; ovary ovoid, obtuse ; stigma subapical.

Type locality : Panama : — El Potrero Camp, Mt. Chiriqui, at about 3000 m. altitude (Pittier 3108, the type).

Peperomia arboriseda var. **moyebambana** C. DC., *Candollea*. I: 379. 1923 is *P. arboriseda* var. *moyobambana* C. DC., l. c. 365. Published in *Bot. Jahrb.* 40 : 261. 1908.

Peperomia blanda var. **cobana** C. DC., *Candollea*. I: 380. 1923 (name only in index).

Leaves pilosulous on the nerves near the base above, and everywhere beneath.

Type locality : Guatemala : — Coban (Türckh. II. 1574, the type).

Peperomia calvicaulis var. **subpenninervis** C. DC., *Candollea*. I: 381. 1923 (name only in index).

Leaves cordulate at the very base, 5-nerved, the upper branches of the midrib one-third above the leaf-base.

Type locality : Costa-Rica : — Las Vueltas, Tucurrique (Pittier 12738, the type).

Peperomia caudulilimba var. **marregantina** C. DC., *Candollea*. I: 382, 1923 (name only in index). Published as *P. caudulilimba* var. *marragantina* C. DC., in *Ann. Conserv. Genève*. 21 : 269. 1920.

Peperomia ciliolibractea C. DC., *Candollea*. I: 360. 1923.

A moderately large velvety rhizomatous herb ; stem rather stout (3.5 mm.), crisp-pubescent, with very short (5 mm.) internodes ; leaves alternate, oblong-ovate, shortly sharp-acuminate, acute-based to subcordulate, rather large ($2.5-4 \times 6-8.5$ cm.), 9- or 11-nerved with 2 or 3 laterals on each side basal, puberulous at least on the nerves on both faces and granular beneath ; petiole long (4-5 cm.) ; spikes elongated ($2 \times 100-140$ mm.), closely flowered ; peduncle elongated (3 mm.) ; bracts round-peltate, ciliolate ; berries subglobose ; stigma apical.

Type locality : Panama : — Chararé river near Chepo (Pittier 4712, the type).

Peperomia claytonioides var. **longicarpa** C. DC., *Candollea*. I: 383. 1923 (name only in index) is a misprint for *P. claytonioides* var. *longiscapa* C. DC. in Trel., *Bot. Gaz.* 73 : 138. 1922.

Peperomia claytonioides var. **pinulana** C. DC., *Candollea*. I: 383. 1923 (name only in index). Published in Trel. *Bot. Gaz.* 73 : 139. 1922.

Peperomia copeyana C. DC., *Candollea*. I: 312. 1923.

A moderately small succulent stoloniferous arboricolous mountain herb, pilose nearly throughout ; stem slender (2 mm.) ; leaves 3 or 4 at a node, lance-elliptic and subacute at both ends, or the lower cuneate-obovate, small (1×2.5 cm.), obscurely 5-nerved, yellowish beneath ; petiole scarcely 5 mm. long ; spikes terminal, as yet young but 2×75 mm. ; peduncle 8 mm. long, glabrous ; bracts round-peltate ; ovary ovoid ; stigma apical.

Type locality : Costa Rica : — Santa Rosa de Copey (Pittier 12228, the type).

Peperomia cuneifolia C. DC., *Candollea*. I: 369. 1923.

C. de Candolle here employed Dietrich's name for the Jamaican plant commonly called *P. clusiiifolia* (Jacq.) Hooker, which does not appear in his *Clavis*.

Peperomia cylindribacca C. DC., *Candollea*. I: 370. 1923.

A rather large repent herb ; stem moderate (3 mm.), rooting from the nodes, very sparingly white hairy but glabrescent ; leaves alternate, lance-elliptic, sharp-acuminate at both ends, large (5×10-12 cm.), obscurely pinnately veined, somewhat ciliate ; petiole short (5 mm.), ciliate ; spikes terminal, paired, slender and elongated (2×70-90 mm.) ; peduncle 1.5-2 cm. long, sparsely white villous ; bracts round-obovate, peltate slightly above the middle ; berries cylindric, 2.5-3 mm. long, obliquely short-rostellate ; stigma anterior on the beak.

Type locality : Panama : — San Felix, Chiriqui (Pittier 5273, the type).

Peperomia dilobostigma C. DC., *Candollea*. I: 385. 1923
(name only in index) is *P. nervosa* (Hildebrand) C. DC., *Bull. Coll. Hawaii*. 2: 34. 1913.

Peperomia dincorana C. DC., *Candollea*. I: 344. 1923.

A misprint for *P. sincorana* under which name M. de Candolle intended to publish it.

Type locality: Brazil: — Serra de Sincora, Bahia at 1100 m. (Ule 7125). Not Panama as indicated for *P. dincorana* in *Candollea*. 2: 188. 1925.

Peperomia Dusenii C. DC., *Candollea*. I: 301. 1923.

Published in *Bot. Jahrb.* 29: 229. 1894.

Peperomia elata C. DC., *Candollea*. I: 355. 1923.

A rather large tree-like essentially glabrous herb; stem rather stout (3 mm.) green mottled with red; leaves alternate, round- to lance-elliptic, rather long-acuminate, acute-based, medium or rather small (2-3 or even 4.5×5-7 cm.), 5- or 7-nerved, slightly ciliate upwards, paler and granular beneath; petiole 3-10 mm. long; spikes axillary and terminal, dark red, slender and elongated (2×80 mm.), loosely flowered; peduncle very slender, 5-10 mm. long; bracts round-peltate; ovary obovoid, obtuse; stigma sub-apical.

Type locality: Panama: — Upper Caldera river, Holcomb's trail, above El Boquete, Chiriqui (Maxon 5582, the type).

Peperomia filiformis Ruiz et Pavon, *Candollea*. I: 388 and 408, is to be kept up instead of *P. Ruiziana*, p. 301, but *P. Ruiziana* C. DC., *Candollea*. I: 355 and 408, is to be kept up.

Peperomia fimbriata var. **pilosior** C. DC., *Candollea*. I: 294. 1923.

Published in *Prod.* 16¹: 450. 1869.

Peperomia gatunensis C. DC., *Candollea*. I: 363. 1923.

A rather small arboricolous herb; stem slender (1.5 mm.), sometimes crisp-pubescent toward the end, the plant otherwise glabrous;

leaves alternate, ovate- or elliptic-oblong, acuminate, rounded and subcordulate at base, moderate or rather large (2-2.5×4-6 or exceptionally 8 or 9 cm.), verruculose beneath, 7-nerved with all but the uppermost branches of the midrib basal ; petiole very short (1-2 mm.) ; spike terminal, slender and elongated (1-2×80-100 mm.), densely flowered ; peduncle short (2 or finally 10 mm.) ; bracts round-peltate ; berries red-brown, oblong, obliquely scutulate ; stigma anterior.

Type locality : Panama : — Along the railroad between Cainito and Monte Lirio, Canal Zone (Pittier 2280, the type).

Peperomia glabella var. **barbulata** C. DC., *Candollea*. I : 325. 1923.

Type locality : Costa Rica : — Aqua Dulce (Pittier 11034, the type).

Peperomia glabella var. **carthaginensis** C. DC., *Candollea*. I : 389. 1923 (name only in index) possibly is *P. glabella catharinensis* C. DC. in Herb., from S. Francisco, Sta. Catharina, Brazil (Ule 361, the type).

Peperomia glabriramea, or *P. glabrirama* as it is given in the *Clavis*, is the name under which C. de Candolle intended to write his description of *P. glaberrima*. A description of it is published under *P. glaberrima* in *An. Inst. Fis.-Geogr. Costa Rica*. 9 : 178. *P. glaberrima* is not in the *Clavis*.

Type locality : Western Costa Rica : — Santo Domingo de Golfo Dulce (Tonduz 9943, the type).

Peperomia Griggsii C. DC., *Candollea*. I : 364. 1923.

A more or less puberulent repent herb ; stem slender (2 mm.), puberulent, rooting from the nodes ; leaves alternate, oblong-ovate, or elliptic, sharply long-acuminate, the rounded base subcordulate, moderate (2.5-3.5×5-7.5 or 9 cm.), slightly pubescent on the nerves of both faces or at least on the midrib beneath, 7-nerved with the innermost branches of the midrib from above the base ; petiole short (5 mm.) or mostly elongated (1 or 1.5-3 cm.) ; spikes opposite the leaves or terminal, paired on a 1-bracted stalk 2-3 cm. long, small

(1×30-45 mm.) or finally 2×110 mm. ; peduncle 10-25 mm. long ; bracts round-peltate ; berries oblong-ellipsoid, obliquely rostrate ; stigma anterior at base of the beak.

Type locality : Guatemala : — Finca Sepacuite, Alta Verapaz (Cook and Griggs 253, the type).

Peperomia gymnophylla C. DC., *Candollea*. I: 363. 1923.

A moderately small glabrous creeping or scandent herb ; stem slender (2-3 mm.), rooting from the lower nodes ; leaves alternate, round-ovate, subcuspidate, rounded at base or shallowly subcordate, moderate (3-4.5×4-5.5 cm.). paler beneath, multiple-nerved, the branches of the midrib on each side 1 basal and 2 from above the base ; petiole elongated (2.5 or the lower as much as 6 cm.) ; spikes paired on a terminal stalk over 4 cm. long, moderately slender and elongated (2×70 mm.), rather closely flowered ; peduncle 10-15 mm, long ; bracts minute, round-peltate ; ovaries ovoid, obliquely truncate ; stigma anterior.

Type locality : Guatemala : — Near the Finca Sepacuite, Alta Verapaz (Cook and Griggs 256, the type).

Peperomia haloensis *Candollea*. I: 303. 1923 is a misprint for *P. ilaloensis* Sod., *Mon. Pip., nov. add.* 9. 1905.

Peperomia Helleri var. **kaholumanana** C. DC., *Candollea*. I: 391. 1923 (name only in index) apparently is based on Heller 2632, the type collection of *P. Helleri*.

Peperomia Heydei var. **minor** C. DC., *Candollea*. I: 336. 1923. Published in *Bot. Gaz.* 19 : 10. 1894.

Peperomia hiloana C. DC., *Candollea*. I: 300. 1923.

A small herb ; stem hirsute upwards ; leaves whorled, elliptic, acute, scant 1×2 cm., 3-nerved, pubescent ; petiole short ; spikes terminal and from the upper axils, 5-7 cm. long, loosely flowered ; peduncle 1 cm. long, pubescent ; bracts round-peltate ; berries globose ; stigma essentially apical.

Type locality : Hawaii : — Hilo (Faurie 157 in part, the type).

Peperomia hygrophiloides C. DC., *Candollea*. I: 329. 1923.

Type locality : Panama : — Rio Caldera, Cerro de la Horqueta, Chiriqui (Pittier 3205, the type).

Peperomia inaequalifolia var. **emarginata** C. DC., *Candollea*. I: 290. 1923.

Published in *Bot. Jahrb.* 40 : 265. 1908.

Peperomia lancilimba C. DC., *Candollea*. I: 290. 1923.

A moderate-sized glabrous herb ; stem rather thick (flattening to 7 mm.) ; leaves alternate, oblanceolate, rather long- and sharp-acuminate, attenuate at base, large (3.5-5.5×12-15 cm.), pinnately veined from below about the middle, the faint nerves about 3×2 ; petiole very short (5 mm.) ; spikes subpaniculate on bracted axillary forking branches, about 1×60 mm., rather loosely flowered ; bracts round-peltate ; ovary sharply scutulate above ; stigma anterior.

Type locality : Costa Rica : — Mt. Barba (Hoffmann, 61,- refer to *P. lancifolia* C. DC., *Prod.* 16¹ : 426 p.p.).

Peperomia leptostachya var. **carnosa** C. DC., *Candollea*, I: 394. 1923 (name only in index) apparently is *P. leptostachya* var. *carnosior* C. DC., *Bull. Coll. Hawaii.* 2: 22. 1913.

Peperomia linearis var. **asperuloides** C. DC., *Candollea*. I: 395. 1923.

A new combination for *P. asperuloides* Sodiro.

Peperomia longibacca C. DC., *Candollea*. I: 369. 1923.

A rather large herb, creeping on tree-trunks ; stem moderately thick (5 mm.), rooting from the nodes, finally glabrous ; leaves alternate, lance- or obovate-elliptic, sharp acuminate, acute at base, large (4-5×9-11 cm.), about 9-nerved, densely ciliate ; petiole short (6 mm.), long ciliate ; spikes terminal, 2 or 3 on a short stalk, slender and elongated (2×85 mm.) ; peduncle 1.5 cm. long, somewhat pilose ; bracts round-peltate ; berries large, cylindrical, obliquely short-mucronulate ; stigma anterior on the beak.

Type locality : Northwestern Costa Rica : — Nicoya (Tonduz 13958,

the type). Ascribed to Ecuador in the *Clavis*, but the description clearly refers to this type specimen.

Peperomia macrocarpa C. DC., *Candollea*. 1: 339. 1923.

A moderately large assurgent glabrous herb ; leaves alternate, ovate, acuminate, cordate, rather large (5×10 cm.), 9-nerved with the innermost branches of the midrib from above the base ; petiole elongated (2 cm.) ; spikes on bracted stalks opposite the leaves, long (160 mm.) ; peduncle 15 mm. long ; bracts round-peltate ; berries round-ovoid, obliquely short-pointed ; stigma subapical.

Type locality : Costa Rica : — Las Vueltas, Tucurrique (Tonduz 13134, the type).

Peperomia mameiana C. DC., *Candollea*. 1: 290. 1923. (In *Candollea*. II : 188. 1925 the name appeared as *P. mamaiana*.)

A glabrous rather succulent rhizomatous herb growing on shaded rocks ; stem rather stout (4-5 mm.) ; leaves alternate, lance-elliptic, acute at both ends, large (7-8×25 cm.), somewhat glossy above, very indistinctly pinnately veined, the delicate branches of the heavy midrib about 7×2 ; petiole thick and long (3-4×80 mm.), channeled or winged ; spikes paniced on long strong axillary or terminal stalks, rather slender and short (1×40 mm. before flowering), obtuse ; peduncle short (scarcely 1 cm.) ; bracts round-peltate, drying golden ; ovary scutelliform above ; stigma anterior.

Type locality : Panama : — Mamei Hill, Canal Zone (Pittier 3805, the type).

Peperomia maniensis C. DC., *Candollea*. 1: 297 and 303, 1923, and of *Candollea*. 2: 188. 1925, is a misprint for *P. mauiensis*, under which name the species appears in the index to the *Clavis*.

Peperomia martagonifolia C. DC., *Candollea*. 1: 313. 1923.

An erect subsimple glabrous herb growing on the ground ; stem moderate (2 mm.), dull ; leaves 3 or 4 at a node, lance-elliptic, rather sharply long-acuminate, acute-based, moderately large (2-3.5×6-8 cm.), dull green, conspicuously 5-nerved, subrevolute ; petiole elongated (commonly 15-25 mm.) ; spikes terminal and axillary, slender and long (2×135 mm.), reticulately ridged between the flowers, obtuse,

peduncle short (scarcely 1 cm.) ; bracts minute, round-peltate ; berries ovoid, obliquely mucronate ; stigma subapical.

Type locality : Costa Rica : — Forest of Santa Rosa de Copey (Tonduz 12243, the type).

Peperomia naranjoana var. **latifolia** C. DC., *Candollea*. I : 362. 1923.

Leaves lance-elliptic, shorter-pointed, larger (5×13 cm.), 9-nerved. Stem and petiole much thicker than in the typical form of the species.

Type locality : Nicaragua : — Volcan El Viejo (Baker 2178, the type). *Not* Panama as indicated in *Candollea*. I : 362, 399. 1923.

Peperomia nicoyana C. DC., *Candollea*. I : 341. 1923.

A rather small glabrate herb ; stem rather slender (2-3 mm.), whitish, rooting below ; leaves alternate, ovate, acute, rounded and unguiculate at base, rather small (2.5×3.5-5 mm.), 5- or obscurely 7-nerved, sparsely appressed-hairy above, pale-granular ; petiole elongated (3-5 cm.), slightly soft-hairy ; spikes terminal, rather small (1×60 mm.) and loosely flowered ; peduncle as long as the petiole, glabrous ; bracts round-peltate ; berries round, obliquely subacute ; stigma subapical.

Type locality : Western Costa Rica : — Forests of Nicoya (Pittier 13692, the type).

Peperomia oblongibacca C. D.C, *Candollea*. I : 288. 1923.

A rather large glabrous epiphytic herb ; leaves alternate, lanceolate, to elliptic, sharply long-acuminate, acute-based, rather large (1,5-2,5 or 3×6-8 cm.), 5 nerved with the innermost nerves from above the base ; petiole slender, 5-10 or on lower leaves 30 mm. long ; spikes on short bracted branches opposite the leaves, very slender and long (1×200 mm.), closely flowered ; peduncle slender, 7 mm. long ; bracts large, roundpeltate ; berry pale, oblong, shortly round-scutulate, glandular ; stigma obliquely anterior.

Type locality : Panama : — Rio Fato, Colon (Pittier 3891, the type).

Peperomia oblongifolia C. DC. *Candollea*. I : 299. 1923.

A small stoloniferous herb ; stem slender (2 mm.), appressed-hirsute ; leaves 3 or 4 at a node, oblong, obtuse, small (4×15 mm.),

merely ciliate ; petiole very short (1 mm.), glabrous ; spikes terminal 1×75 mm., closely flowered ; bracts round-peltate ; berry ovoid, obliquely acute ; stigma anterior.

Type locality: Costa-Rica: — Quebrada honda, near Juan Vinas (Pittier 10419, the type).

Peperomia obscurifolia C. DC., *Candollea*. I : 357. 1923.

A small stoloniferous epiphytic herb ; stem slender (2 mm.), appressed-hairy ; leaves alternate, lance-elliptic, acute at both ends, rather small (1×2,5-3 cm.), dark green drying dark above and yellowish beneath, 5-nerved, more or less persistently ciliolate and with the nerves sparsely hairy beneath ; petiole very short (2 mm.) ; spikes axillary and terminal, slender and moderately elongated (1×50-65 mm.), with pseudo-pedicels ; peduncle short (6 mm.), soft-hairy ; bracts round-peltate ; berries globose, obliquely apiculate ; stigma subapical.

Type locality: Panama: — Agua Clara, Trinidad river, Canal Zone (Pittier 3982, the type).

Peperomia Ottoniana var. **boliviensis** C. DC., *Candollea*. I : 345. 1923.

Published in Fedde. *Rep.* 13 : 308. 1914.

Peperomia ovalifolia Hook., *Candollea*. I : 400. 1923 (name only in index) is *P. trifolia* (L.) Dietr., keyed out on pp. 300 and 308 of the *Clavis*.

Peperomia palcipila var. **longispica** C. DC., *Candollea*. I : 401. 1923 (name only in index).

Published in *Bull. Herb. Boiss.*, II. 7 : 142. 1907.

Peperomia palmana var. **fragrans** C. DC., *Candollea*. I : 401. 1923 (name only in index).

Published in *Bull. Soc. Roy. Bot. Belg.* 30 : 233. 1891.

Peperomia panamensis C. DC., *Candollea*. I : 329, 401. 1923.

A small stoloniferous at most ciliolate herb ; stem creeping on trees, rooting from the nodes, slender (1 mm.) ; leaves alternate, suborbicular

or round-obovate, rounded at apex, acute at the very base, minute or small (6×8 — 14×18 mm.), 3- or 5-nerved ; petiole short (scarcely 5 mm.) ; spikes terminal and axillary, small (1×11 mm.), closely flowered ; peduncle short (6 mm.) ; bracts round-peltate ; berries oblong, pale ; stigma apical.

Type locality : Panama : Rio Indio de Gatun, Canal Zone (Pittier 2789, the type).

Peperomia pascuicola C. DC., *Candollea*. I: 352. 1923.

A moderately small assurgent glabrous herb ; stem rather thick (4 mm.), rooting from the lower nodes ; leaves alternate, lance-elliptic, acuminate, acute at base, rather large (scarcely 3.5×8 cm.), 5-nerved ; petiole 1 cm. long ; spikes terminal, rather slender and long (2×90 mm.), closely flowered ; peduncle as long as the petiole ; bracts round-peltate ; berries globose, obliquely-rostellate, raised on elevations of the rachis ; stigma anterior.

Type locality : Panama : — Pastures around El Boquete, Chiriqui (Pittier 2915 a, the type).

Peperomia peltilimba C. DC., *Candollea*. I: 373. 1923.

Published in *Tr.J. Bot. Gaz.* 73 : 145. 1922.

Peperomia penicillata var. **magnifolia** C. DC., *Candollea*. I: 306. 1923.

Published in *Urb. Symb. Ant.*, 7 : 190. 1912.

Peperomia pililimba C. DC., *Candollea*. I: 335. 1923.

A small long-villous herb, growing on rocks ; stem slender (2-3 mm.), rooting from the nodes ; leaves alternate, lance-elliptic, small (scarcely 8×20 mm.), 3-nerved ; petiole short (3 mm.), ; spikes terminal and axillary, moderately slender and elongated (2×75 mm.) ; peduncle 15-20 mm. long ; bracts round-peltate ; berries round-ovoid, rostellate ; stigma anterior.

Type locality : Guatemala : — Coban (von Turckheim II. 1383, the type).

Peperomia piperea C. DC., *Journ. Bot.* 4 : 143. 1866. *Prod.* 16¹: 425. 1869.

Type locality : Guiana (Parker, Herb. Kew.). Type specimen at Kew consists of the barren stem of an aroid, which may be a *Monstera*, with two leaves, two petioles, and a detached spike of some *Piper* in young fruit.

Peperomia platyphylla C. DC., *Candollea*. I : 368. 1923.

A rather large glabrous herb ; stem stout (6 mm.) ; leaves alternate, round-ovate, short-acuminate, cordate, large (12×14 cm.), paler beneath, 7-nerved with the midrib trifid about the lower third ; petiole very long (8-10 cm.) ; spikes paired on 1-bracted stalks 7 cm. long that are axillary or opposite the leaves, long (1,5×120 mm.), closely flowered ; peduncle almost lacking or as much as 1 cm. long ; bracts round-peltate ; berry oblong-ovoid, slenderly long-beaked, stigma anterior.

Type locality : Costa Rica : — Juan Vinas, Reventazon valley (Cook and Doyle 69, the type).

Peperomia psiloclada var. ***magnifolia*** C. DC., *Candollea*. I : 350. 1923.

Differs from the typical form of the species in somewhat larger elliptic leaves (2,7-3,5×5,5 cm.).

Type locality : Costa Rica : — Sta. Rosa de Copey (Pittier 12222, the type).

Peperomia punctata C. DC., *Candollea*. I : 331. 1923.

A delicate succulent herb ; stem slender, creeping and rooting from the nodes below, hairy ; leaves alternate, elliptic, obtuse to subacute at both ends, folded down the middle, minute (usually 3×6 mm.), glabrous, more or less evidently dark-punctulate, obscurely 1-nerved ; petiole scarcely 1 mm. long ; spikes terminal, small (scarcely 1×20 mm.), obtuse ; peduncle glabrous, very slender and short (scarcely over 5 mm. long) ; bracts round-peltate ; ovary obovoid ; stigma slightly oblique.

Type locality : Costa Rica : Turrialba (Pittier 13376, the type).

Peperomia reflexa var. ***argentina*** C. DC., *Candollea*. I : 406. 1923 (name only in index).

Published in Fedde *Rep.* 13 : 397. 1914.

Peperomia reflexa var. **robustior** C. DC., *Candollea*. I : 406. 1923 (name only in index).

Published in Fedde *Rep.* 13 : 304. 1914.

Peperomia rotundifolia var. **pilosior** C. DC., *Candollea*. I : 407. 1923 (name only in index).

Published in Urb. *Symb. Antill.* 3 : 230. 1902.

Peperomia rotundifolia var. **subglabrilimba** C. DC., *Candollea*. I : 326. 1923.

Type locality : Panama : Frijoles, Cana Zone (Pittier 3759b, the type).

Peperomia saldasiana C. DC., *Candollea*. I : 332. 1923.

Appears also in the index to the *Clavis* as *P. caldasana*. Evidently is a typographical error for *P. caldasiana* C. DC. *Linnaea* N. F. 3 : 365.

Peperomia salmensis, f. *b.* C. DC., *Candollea*. I : 347. 1923.

This is *P. coahuensis* f. *b.*, — the name *salmensis* being a copyist's error for *coahuensis*.

Peperomia sanramonensis C. DC., *Candollea*. I : 332. 1923.

A small glabrous arboricolous herb ; stem filiform ; leaves alternate, elliptic, obtuse, acute-based, small (6-10×15-18 mm.), 3-nerved ; petiole very short (3 mm.) ; spikes terminal, very small (1×6 mm.), closely flowered ; peduncle 5 mm. long ; bracts round-peltate ; berries subglobose.

Type locality : Costa Rica : — Santiago valley, near San Ramon (Brenes 14183, the type).

Peperomia san-salvadorana C. DC., *Candollea*. I : 344. 1923.

A small prostrate glabrous herb ; stem slender (scarcely 1.5 cm.), subtetragonal ; leaves alternate, lance-elliptic, acuminately attenuate, acute at base, small (10×23 mm.), 3-nerved ; petiole short (2-5 mm.) ; spikes axillary and terminal, small (1×32 mm.) ; peduncle short (4 mm.) ; bracts round-peltate ; berries globose, separated by anastomosing ridges ; stigma subapical.

Type locality: El Salvador: — Volcan de San Salvador at 2100 meters (Niederlein 85, the type).

Peperomia sarcophylla var. *minor* C. DC., *Candollea*. 1: 409. 1923 (name only in index).

Published in *Bot. Jahrb.* 40: 263. 1908 as *P. sarcophylla* var. *minor*.

Peperomia sirupayana C. DC., *Candollea*. 1: 361. 1923.

Type locality: Bolivia: — Sirupaya, S. Yungas (Buchtien, without number).

Peperomia stelecheophylla C. DC., *Candollea*. 1: 373, 410. 1923.

This is a misprint for *P. stelecophila*.

Peperomia Stewartsii C. DC., *Candollea*. 1: 333, 410. 1923.

This is a misprint for *P. Stewartii*.

Peperomia substriata C. DC., *Candollea*. 1: 291. 1923.

A moderately large somewhat silky-pubescent herb; stem scandent rooting from the nodes, with erect leafy branches, moderate (2 or 3-5 mm.), more or less transiently silky; leaves alternate, elliptic, short-acuminate, acute at base, moderately small ($2 \times 4,5$ - $3,5 \times 5$, 4×8 or even $6,5 \times 14$ cm.), pinnately veined throughout, the branches of the midrib 6 or 8×2 , silky on both faces; petiole elongated (2-3,5 cm.); spikes several on the upper part of a bracted terminal stalk 3 cm. or more long, slender and elongated (about 2×100 mm.), somewhat loosely flowered; peduncles short (5 mm.); bracts round-peltate; ovaries in elongated pits, short-beaked; stigma anterior below the beak.

Type locality: Costa-Rica: Alto de La Palma (Tonduz 12473, the type).

Peperomia urocarpoides C. DC., *Candollea*. 1: 362. 1923.

A rather small repent crisp-hairy herb; stem slender (1 mm.); leaves alternate, ovate, very shortly blunt-acuminate, rounded at the base, small ($1,5 \times 2,5$ - $2,5 \times 3$ cm.), 5-nerved, somewhat granular;

petiole 10-15 mm. long, spikes terminal, small (1×30 mm.) ; peduncle as long as the petiole ; bracts round-peltate ; berries oblong, slender-mucronate ; stigma anterior.

Type locality : Panama : — Cerro de Garagara, Sambu Basin, Darien (Pittier 5670, the type).

Peperomia Wercklei C. DC. *Candollea*. I : 306. 1923.

A glabrous herb closely resembling *P. martagonifolia* ; the verticillate leaves cuneately decurrent on the shorter (scarcely 10 mm. long) petiole, 3-nerved, about $2,5 \times 6$ cm. ; peduncle about 1,5 cm. long.

Type locality : Costa-Rica : San Cristobal de Candelaria, Cartago (Wercklé 3688, the type).

PIPER

Piper aduncum var. **laevilimbium** C. DC., *Candollea*. I : 116. 1923.

This is *P. aduncum* var. *laevifolium*.

Piper amplilimbium C. DC., *Candollea*. I : 234. 1923.

This is keyed out on p. 213, not p. 218.

Piper argillicola C. DC., *Ann. Conserv. Jard. Bot. Genève*. 21 : 237. 1920.

Attributed in the publication by error to Colombia. The label accompanying the type (Langlassé 52) shows it to have been collected in the Western Sierras in Mexico.

Piper barbulatum C. DC., *Candollea*. I : 124. 1923.

Flowering internodes slender and short (2-2,5 cm.), for a time sparingly velvety-pilose ; leaves lanceolate or lance-oblong to oblanceolate, gradually long-acuminate, obliquely rounded at base sometimes with one side very slightly shorter, moderately large ($5-6 \times 13-18$ cm.), pinnately nerved from below the middle or upper third, the nerves 4 or 5×2 , somewhat pubescent on the nerves beneath, rather glossy ; petiole short (5-10 mm.), winged to about the middle, sparingly hirsute ; spikes opposite the leaves, rather slender and short ($3 \times 50-60$

mm.), short-mucronate ; peduncle rather slender, short (5 mm.), glabrate ; bracts concave-inflexed, dingy-hairy ; flowers sessile, perfect ; stigmas 3, sessile ; berries oblong, dingy-velvety.

Type locality : Western Costa Rica : — Nicoya (Tonduz 13697, the type).

Piper borneanum C. DC., *Ann. Conserv. et Jard. Bot. Genève.* 21 : 231. 1920.

Misprint for *P. borucanum* C. DC., *Bull. Soc. Bot. Belg.* 30 : 219. 1891.

Piper brevilimbum C. DC., *Candollea.* 1 : 128. 1923.

A shrub ; flowering internodes rather slender and short, slightly velvety or glabrous ; leaves lance-elliptic, subcaudately acuminate, acute at base with one side slightly shorter, rather small (2,5-3,5 × 5-8 cm.), pinnately nerved from below the middle, the nerves about 4 × 2, glabrous ; petiole short (scarcely 5 × 3 mm.), not winged, glabrous ; spikes opposite the leaves, as yet scarcely 3 × 50 mm. ; peduncle filiform, 10 mm. long, glabrous ; bracts round-subpeltate, somewhat ciliate ; flowers sessile, perfect.

Type locality : Eastern Guatemala : — Coban, Alta Verapaz (von Turckheim II, 1625, the type).

Piper citrifolium var. **panamense** C. DC., *Candollea.* 1 : 114, 242, 1923.

Type locality : Panama : — Chagres, Colon (Fendler 270, the type).

Piper culebranum C. DC., *Candollea.* 1 : 121. 1923.

A small tree 2 m. high ; nodose ; flowering internodes slender, very short (1-2 cm.), rusty villous ; leaves elliptic or elliptic-oblongate, slender-acuminate, rounded at base and somewhat shorter on one side, rather small (6-7 × 13-17 cm.), pinnately nerved from below the middle, the nerves 4 or 5 × 2, very sparsely appressed-soft hairy and rather glossy above, loosely villous on the nerves beneath ; petiole short (scarcely 5 × 3 mm.), villous, not winged ; spikes opposite the leaves, slender, mucronate (when very young only 1 × 23 mm.) ; peduncle slender, villous ; bracts subpeltate, ciliate ; flowers sessile.

Type locality : Central Panama : — Rio Culebra above Santa Isabel, Colon (Pittier 4154, the type).

Piper dilatatum var. **leptocladum** C. DC., *Candollea*. 1 : 245, 1923.

Keyed out on p. 96.

Piper dilatatum var. **pseudodilatatum** C. DC., *Candollea*. 1 : 245. 1923.

Keyed out on p. 96.

Piper elmuletonum C. DC., *Candollea*. 1 : 72. 1923.

Clearly based on one of Langlassé's specimens from El Muleto, „ Michoacan or Guerrero ” in Western Mexico. Apparently differentiated from *Piper Michelianum* through having four instead of three stigmas, and the leaves 11 nerved instead of 7-9 nerved. Probably comprised under Langlassé's No. 215, which included both *P. Michelianum* and *P. consociatum*.

Piper consociatum C. DC., *Ann. Conserv. et Jard. Bot. Genève*. 21 : 317. 1920, appears not to have been kept up by C. de Candolle in the *Clavis*, although it is in the index to the *Clavis*.

Piper hispidinervum C. DC., *Candollea*. 2 : 187. 1925.

Evidently is *P. hispidonervum* C. DC., *Candollea*. 1 : 114. 1923.

Piper lambeanense C. DC., *Candollea*. 1 : 101, 255, 1923.

A misprint for *P. lambeauense* C. DC., in *Fedde Rep.* 10 : 519. 1912.

Piper leptocladum C. DC., *Candollea*. 1 : 256. 1923.

Keyed out on p. 96.

Piper pachystachyon var. **copeyanum** C. DC., *Candollea*. 1 : 266. 1923 (name only in index).

This apparently is *P. irazuanum*, which occurs at Copey as well as elsewhere in Costa Rica.

Piper pervenosum C. DC. *Candollea*. 1 : 268. 1923 (name only in index).

A shrub ; flowering internodes moderately slender but short, gray-tomentulose ; leaves broadly ovate, subacute, equally rounded or

slightly cordulate at base, rather large (8×14 – 11×18 cm.), pinnately nerved from below the upper third, the main nerves 3 or 4×2 but with intermediates and spaced shorter veins nearly to the end, glabrous gray-green, paler beneath; petiole very short (5 mm.), tomentulose-puberulent, winged to the end; spikes terminal or opposite the leaves, small (4×25 mm.); peduncle short (scarcely 10 mm.), gray-tomentulose; bracts lunulate; flowers sessile, perfect; ovary round, with a very short style.

Type locality: Northeastern Panama: — Puerto Obaldia, San Blas Coast, Colón (Pittier 4302, the type).

Piper polyneurum C. DC., *Candollea*. 1: 270. 1923 (name only in index).

A small tree 2-4 m. tall; coarsely glandular-granular throughout; flowering internodes moderately stout and long, sparingly tomentulose or glabrate, leaves elliptic-ovate, short-acuminate, subequally cordulate or rounded or exceptionally acute at base, large (9 – 11×20 – 23 cm.), pinnately nerved nearly throughout the nerves about 12×2 , appressed-pubescent on the nerves beneath; petiole short (5 mm.) and not winged or on the round-based leaves elongated (20-40 mm.) and winged to the end, glabrate; spikes opposite the leaves, arched, rather large (5×100 mm.); peduncle thick and short (scarcely 10 mm.), glabrate; bracts large, deltoid-peltate, brown tomentulose; flowers sessile, perfect; stigmas 3, large, slightly stalked.

Type locality: Panama: — Cerro de Garagara, Sambu Basin Darien (Pittier 5677, the type).

Piper polytrichum C. DC., *Candollea*. 1: 110. 1923.

Flowering internodes relatively stout and very short (1.5 cm.), densely yellowish-villous; leaves broadly lance-oblong, inequilateral, gradually acuminate, cordulate at the broad base with one lobe covering the petiole, moderately large (5×14 – 15 cm.), pinnately nerved from below the middle, the nerves 5×2 , appressed-villous, the long slender hairs from large white bases; petiole very short (under 5 mm.), villous; spikes opposite the leaves, rather slender and short (before flowering 2×35 mm.); peduncle slender, short (5 mm.), loosely villous; bracts round-subpeltate, ciliolate; flowers sessile.

Type locality : Costa Rica : — Cânas Gordas (Pittier 11071, the type).

Piper pseudodilatatum C. DC., *Candollea*. I : 271. 1923.

Keyed out on p. 96 as a variety of *P. dilatatum*.

Piper pseudopropinquum.

Noted in the index to the *Clavis Piperacearum* of Casimir de Candolle as a new species, but it is antedated by *P. pseudopropinquum* of Costa Rica, C. DC., *Linnaea*. 37 : 341. The Panama material (El Boquete, Chiriqui, Pittier 3023) differs from this latter in its larger leaves, and stigmas on a short style, thus fitting the description of *P. papyraceum*, Trelease ined.

Piper Richardianum var. **glabrifolium** C. DC., *Candollea*. I : 75. 1923.

Type locality : Cuba : — Santiago, Oriente (Britton, Britton and Cowell 12850) ; Puerta Piedra (Britton, Britton and Cowell 12492).

Piper Richardianum var. **latilimum** C. DC., *Candollea*. I : 75. 1923.

Type locality : Cuba : — Santiago, Oriente (Britton, Britton and Cowell 12625, the type).

Piper Rudgeanum (Miq.) C. DC., *Prodr.* 16¹ : 373. 1869.

This is from Guinea and not from Guiana as stated in *Candollea*. I : 168. 1923.

Piper salinasanum var. **verbenanum** C. DC., *Candollea*. I : 275. 1923.

Keyed out on p. 97. It appears in the index (p. 284) as *P. verbenaceum*.

Piper scabrilimum C. DC., *Candollea*. I : 121. 1923.

Flowering internodes slender and short (2-3 cm.), dingy-tomentulose and subhirsute ; leaves oblong- or ovate-lanceolate ; rather long-acuminate, slightly unequally rounded at base or shallowly cordulate, rather large (6×18—8×22 cm.), pinnately nerved from below about the

middle, the nerves about 5×2 , cancellately veined, scabrous ; petiole rather short (scarcely 10 mm.), tomentose scabrid, winged at base ; spikes opposite the leaves, elongated (when young 2×80 mm.), somewhat arcuate ; peduncle rather short (10 mm.), sparsely velvety ; bracts triangular-subpeltate, ciliolate ; flowers sessile, perfect.

Type locality : Southeastern Panama : — Boca de Pauarandô. Sambu River. Darien (Pittier 5584, the type).

Piper tithymaloides (Vahl) Dietr.. *Sp.* 1, 152 ; *Prodr.* n. 239. Not « Sw. » as stated in *Clavis* p. 412.

Piper tuberculatum var. **minus** C. DC., *Candollea.* 1 : 142. 1923.

Published in *Prod.* 16¹ : 266. 1869.

Piper tuberculatum var. **obtusifolium** C. DC., *Candollea.* 1 : 142. 1923.

Published in *Bot. Gaz.* 19 : 8. 1894.

Piper umbellatum var. **tomentellum** C. DC., *Candollea.* 1 : 170. 1923.

Type locality : Costa Rica : Nicoya (based on Tonduz 13688).

Piper verbenaceum C. DC., *Candollea.* 1 : 284. 1923.

This is a misprint for *P. verbenanum*. Keyed out on p. 97.

Key, p. 81 (25) " Folia multinervia " should key out through 26 and " Folia multiplinervia " through 46.
