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Guido Mathieu & Martin W. Callmander

Abstract

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An upcoming taxonomic treatment accepts 60 species of *Peperomia* Ruiz & Pavón (*Piperaceae*) from the state of Veracruz in Mexico. A total of 19 species needed a nomenclatural act. Lectotypes of four species were designated previously and the remaining 15 species are lectotypified here. Each of them is discussed in detail. Ten of these species were described by Casimir de Candolle (1836-1918) and some comments on the G herbaria, housing most of Candolle's types, are provided.

Keywords

PIPERACEAE – *Peperomia* – Lectotypification – Nomenclature – Mexico – Veracruz – C. de Candolle – G-DC

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Introduction

In preparation of a treatment of *Peperomia* Ruiz & Pavón (Piperaceae) for the Flora of Veracruz, Mexico, it became evident that 19 out of the 60 species that occur in the state (VERGARA-RODRÍGUEZ et al., 2017) are in need of lectotypification. The lectotypification of four Veracruzian *Peperomia* was published earlier: *P. asarifolia* Schltdl. & Cham., *P. dendrophila* Schltdl. & Cham., *P. deppeana* Schltdl. & Cham., and *P. edulis* Miq. (MATHIEU & CALLEJAS-POSADA, 2006; HEUCHERT et al., 2017).

The lectotypifications of the remaining 15 species are presented below: *P. berlandieri* Miq., *P. bracteata* A.W. Hill, *P. botterii* C. DC., *P. camptotricha* Miq., *P. cobana* C. DC., *P. donaguiana* C. DC., *P. drusophila* C. DC., *P. huatuscoana* C. DC., *P. liebmännii* C. DC., *P. nigropunctata* Miq., *P. schiedeii* C. DC., *P. subblanda* C. DC., *P. tenerima* Schltdl. & Cham., *P. tlapacoyoensis* C. DC., and *P. urocarpoides* C. DC.

Ten of the 15 designated lectotypes refer to species published by Casimir de Candolle (1836–1918), who worked extensively on the Piperaceae family (BRIQUET, 1940). The herbarium referring to this plant family, with many type specimens, is part of the closed Candolle herbarium (G-DC) alongside the *Prodromus* and the *Monographia Phanerogamarum* herbaria. Taxa are arranged alphabetically by genera. Duplicates of these collections are often included in various acquisitions of G: the Benjamin Delessert (1773–1847) herbarium, the foundation of the general herbarium (G) given to the City of Geneva in 1869 [see CALLMANDER et al. (2017) for a brief summary of the Geneva herbaria history], the Candolle herbarium that was not originally used for the *Prodromus*, the Moise-Etienne Moricand (1779–1854) herbarium and the William Barbey-Boissier (1842–1914) herbarium.

Acronyms of cited herbaria follow INDEX HERBARIORUM (2017) and scans of the cited protologues and designated lectotypes are accessible online via the TRGP [Taxonomic Repertory of the Genus *Peperomia*] (MATHIEU, 2001-).

Nomenclature

Peperomia berlandieri Miq. in Syst. Piperac. 158. 1843.

Lectotypus (designated here): **MEXICO**: Hunsteca, VI.1827, *Berlandier 933* (G [G00438572]!; isolecto-: BM [2 sheets]!, G [G00438571, G00341704]!, G-DC [G00317285]!, HAL [HAL0101724]!, U!, W1889-0114062!, W0024314!).

Notes. – Of the type collection, *Berlandier 933*, two duplicates (in B and G) were cited in the protologue. The B specimen was lost during World War II. A picture is not part of J. Francis Macbride's Types photographs kept in F (see GRIMÉ & PLOWMAN, 1986). Three specimens of this collection are extant in G originating from the Delessert herbarium

[G00438572], the Moricand herbarium [G00438571]) and the Barbey-Boissier herbarium [G00341704]. There is also a duplicate in G-DC [G00317285], mounted together with *Pittier 354*. The specimen from the Delessert herbarium [G00438572], mentioned in the protologue, is the only one that bears an annotation label in the handwriting of Friedrich Anton Wilhelm Miquel (1811–1871). It is designated here as the lectotype.

Peperomia botterii C. DC. in J. Bot. 4: 145. 1866.

Lectotypus (designated here): **MEXICO**: Orizaba, 1855, *Sallé s.n.* (G-DC [G00208262]!; isolecto-: G [G00341701, G00341706]!). **Syntypus**: **MEXICO**: *sine loc.*, 1856, *Botteri s.n.* (G-DC [G00208263]!) (Fig. 1).

Notes. – Two syntypes were designated in the protologue: *Botteri s.n.* and *Sallé s.n.*, both in G-DC (Fig. 1). They are mounted together on the same sheet. The *Sallé* collection, mounted to the right side, better shows the characteristics of the species and is designated here as the lectotype. Two duplicates in G are considered part of the original material: one originating from the Barbey-Boissier herbarium and labeled as: “Orizaba, M. Sallé 1855” [G00341701] and the other one originating from the Moricand herbarium [G00341706] and labeled as: “Plantes du Mexique récoltés par M. Sallé aux environs d’Orizaba en 1854–1855”. The latter specimen mentions a number “50”, but it is unclear whether this is a collection number. Other *Peperomia* collected by *Sallé* are extant in the G herbaria (all to be determined as *P. subblanda* despite former identifications) there is only one specimen that bears a number whereas apparent duplicates remained unnumbered: *Sallé 122* [G00341709] originating from the Moricand herbarium; *Sallé s.n.* [G00341707] from the Barbey-Boissier herbarium and two *Sallé s.n.* specimens from the G-DC herbarium [G00208247, G00208264].

Peperomia bracteata A.W. Hill in Ann. Bot. (Oxford) 21: 155. 1907.

Lectotypus (designated here): **GUATEMALA. Dept. Huehuetenango**: Todos los Santos, 11.IX.1896, *Seler 2731* (GH!). **Syntypus**: **GUATEMALA. Dept. Huehuetenango**: Estancia de la Virgen, 13.IX.1896, *Seler 2743* (GH!).

Notes. – Two syntypes were designated in the protologue: *Seler 2731* and *2743* (both in B). These B specimens were lost during World War II and pictures are not extant in F (see above). TRELEASE (1922: 138) cited *Seler 2743* as type material but mentions it with the collection locality of *Seler 2731* (as



Fig. 1. – The two syntypes of *Peperomia botterii* C. DC. mounted together on the same sheet in the C. de Candolle's *Piperaceae* herbarium in G-DC. The designated lectotype, Sallé s.n. (G-DC [G00208262]), is mounted to the right side.

“Sactos”). This cannot be accepted as an implicit lectotypification. *Seler 2743* is designated here as the lectotype. This collection is mounted together with *Seler 2743* in GH.

Peperomia camptotricha Miq., Syst. Piperac. 144. 1843.

Lectotypus (designated here): **MEXICO**: Hacienda de la Laguna, VIII.1829, *Schiede s.n.* [9] (HAL [HAL0101723]!; isolecto-: P [P00438827]!, U181752!).

Notes. – *Schiede s.n.* [9] at B was designated as the holotype in the protologue. The B specimen was lost during World War II and no picture is extant in F (see above). A drawing is extant in G-DC [G00317989]. The duplicate in HAL, bearing an annotation label in Miquel's handwriting, is designated here as the lectotype.

Peperomia cobana C. DC. in Bot. Gaz. 19: 260. 1894.

Lectotypus (designated here): **GUATEMALA. Alta Verapaz**: near Coban, 1400 m, VI.1879, *von Türckheim 78* (US [00104430]!; isolecto-: GOET [GOET009426]!, JE [JE00012657]!, W [2 sheets]!).

Notes. – *Von Türckheim 78* was designated as type in the protologue with no mention of herbaria. Two duplicates (GOET and US) bear the handwriting of C. de Candolle. The US duplicate is the most complete specimen and is designated here as the lectotype. No duplicates have been located in the G herbaria.

Peperomia donaguiana C. DC. in Linnaea 37: 382. 1872.

Lectotypus (designated here): **MEXICO. Oaxaca**: Trapiche de la Concepcion, VII.1842, *Liebmann 145* (C [C10016449]!; isolecto-: F667444!). **Syntypus**: **MEXICO. Oaxaca**: Donaguia, VIII.1842, *Liebmann 144* (C [C10016450]!, G-DC [G00328438]!).

Notes. – Two syntypes were designated in the protologue: *Liebmann 144* and *145* (both in C). The latter exhibits plenty of informative material and is designated here as the lectotype.

Peperomia drusophila C. DC. in Linnaea 37: 372. 1872.

Lectotypus (designated here): **MEXICO**: El Mirador, *Liebmann 133* (C [C10016452 right specimen numbered “1”]!; isolecto-: G-DC [G00328434]!). **Syntypi**: **MEXICO**: Potrero de Consoquitla, X.1841, *Liebman 138* (C!); Sto Antonio Huatusco, 1841, *Liebmann 146* (G [G00328439]!); Sto Antonio Huatusco, III.1842, *Liebmann 147* (M!).

Notes. – Four syntypes were designated in the protologue, i.e. *Liebmann 133*, *138*, *146* and *147*, all deposited in C. Duplicates of *Liebmann 133* and *138* were also cited in G-DC. *Liebmann 147* was not located in C but a duplicate was found in M. The specimen *Liebmann 133* deposited in C bears an annotation “ms” and “Determ. C.DC. 1871”. It is designated here as the lectotype. It is mounted in the right half of the sheet and annotated “1”. On the same sheet is mounted *Liebmann 134*, in the left half and annotated “2”. The G-DC isolectotype is mounted together with *Liebmann 139* [G00328433] and *146* [G00328439].

Peperomia huatuscoana C. DC. in Linnaea 37: 383. 1872.

Lectotypus (designated here): **MEXICO**: “Inter Totutla et Huatusco, Dos Puentes”, VIII.1841, *Liebmann 129* (C [C10016459]!; isolecto-: F667445!, G-DC [G00329863]!, K [K000324533]!, UPS!). **Syntypus**: **MEXICO**: San Antonio Huatusco, VIII.1841, *Liebmann 128* (C [C10016460]!, GH [GH00004973]!).

Notes. – Two syntypes were designated in the protologue: *Liebmann 128* and *129* (both in C, the latter also in G-DC). *Liebmann 129* deposited in C bears an annotation “ms” and “Determ. C.DC. 1871”. It is designated here as the lectotype.

Peperomia liebmannii C. DC. in Linnaea 37: 383. 1872.

Lectotypus (designated here): **MEXICO. Oaxaca**: Trapiche de la Concepcion et Comaltepu, VI.1842, *Liebmann 104* (C [C10016464]!; isolecto-: G-DC [G00314155]!). **Syntypus**: **MEXICO. Oaxaca**: Trapiche de la Concepcion et Comaltepu, VII.1842, *Liebmann 105* (C [C10016465]!, G-DC [G00314156]!).

Notes. – Two syntypes were designated in the protologue: *Liebmann 104* and *105* (both in C, the latter also in G-DC). *Liebmann 104* is designated here as the lectotype because it includes the most complete material of the species. *Liebmann 104* and *105* are mounted on the same sheet in G-DC.

Peperomia nigropunctata Miq., Syst. Piperac. 188. 1843.

Lectotypus (designated here): **FRANCE. Dept. d'outre-mer Martinique**: s.d., *Sieber 6* (HAL [HAL0101719]!; isolecto-: BM [BM000839201]!, BR!, GH [00005076]!, GOET!, L!, M!, MO2055682!, MPU [MPU019287] image seen, P [P00624765]!, PRC [2 sheets]!, W1889-0067811!, W1889-0187269!, W1189-0272259!, W1889-0272263!).

Notes. – *Sieber 6* in B was designated as the holotype in the protologue. However, that specimen was lost during WWII and no picture is extant in F (see above). Of the several duplicates only the one from HAL bears an annotation label in the handwriting of Miquel and is designated here as the lectotype. Some specimens with the same number have to be excluded (G [G00341708]!, JE!, K!, P [P00624766]!, W [W0024326]!). They appear to belong to *P. hirtella* Miq. A specimen in Miquel's herbarium at U (now in L) is very likely a clastotype. It bears an annotation label in Miquel's handwriting and mentions Sieber as the collector without collecting number.

Peperomia schiede C. DC. in Candollea 1: 340. 1923.

Lectotypus (designated here): **MEXICO. Veracruz:** Xalapa, *Schiede s.n.* [6] (P mounted to the left side!; isolecto-: MO-2090834 mounted to the left side!, W mounted to the left side!).

Notes. – Original material has been located at P, MO and W and all show a mix gathering. To the left side is mounted what is considered as the real *P. schiede*, described by CANDOLLE (1923: 340) as: “repens aut scandens”. Mounted to the right side is a much more fragmentary specimen with erect habit. It shows a thick stem, leaves with a different shape, different nervation pattern and shorter petioles. The specimen to the left side on *Schiede s.n.* [6] in P is designated here as the lectotype.

Peperomia subblanda C. DC. in Annuaire Conserv. Jard. Bot. Genève 21: 320. 1920.

Lectotypus (designated here): **MEXICO. San Luis Potosi:** Las Canoas, 7.VIII.1891, *Pringle 3906* (G [G00438810]!; isolecto-: BM!, BR [BR852965, BR822513]!, CM [CM0454]!, E [E00504333]!, ENCB!, F [V0066921F]!, G [G00341705]!, GH [00222636]!, GOET [GOET009444]!, HBG [HBG517755] image seen, ISC!, JE [JE00012644]!, K!, KFTA [KFTA0003150] image seen, M!, MEL [MEL2391347] image seen, MEXU!, MO3453877!, NY [NY00689013, NY00689014]!, P [P00463560, P00438846]!, PH [PH00047135, PH00021217]!, S-G-7841!, US [US00900375, US00900376]!, VT [UVMVT100506] image seen, W1892-0009633!).

Notes. – Two syntypes were designated in the protologue: *Pringle 3906* from Mexico and *Bang 1819* [distr. by Britton & Rusby] from Bolivia in B. Both were lost during WWII. No picture is extant in F (see above). *Bang 1819* is excluded because it appears to be close to or even identical with the

South American *P. rotundata* Kunth described from Colombia. *Pringle 3906* on the other hand represents a different species that appears to be endemic to Mexico. The collection has ample duplicates but only the two in G have been seen by C. de Candolle. The most complete sheet is designated here as the lectotype.

Peperomia tenerrima Schltdl. & Cham. in Linnaea 6: 353. 1831.

Lectotypus (designated here): **MEXICO. State Veracruz:** “Cuesta grande de Jalacingo reg. temp.”, XII.1828, *Deppe & Schiede s.n.* [1107] (HAL [HAL0101707]!; isolecto-: BM!, L!, LE [LE00001516] image seen, W0024369!, W0024370!).

Notes. – The type collection was not designated in the protologue but its locality was clearly mentioned as “Cuesta grande de Jalacingo reg. temp.”. The publication title is: *Plantarum Mexicanarum Schiede et Deppe collectarum* (SCHLECHTEN-DAL & CHAMISSE, 1831) and the protologue is preceded by number 1107. Specimens of *Deppe & Schiede* “1107” have been located at BM, HAL, LE and W. The HAL specimen bears a collection label in Schiede's handwriting and an identification annotation “*Peperomia tenerrima* n. sp.” in Chamisso's handwriting. It is designated here as the lectotype. The specimens in HAL, LE and W (W0024370) bear the number 1107, most probably added after publication of the species. The BM specimen does not show this number but has an identical collecting label as the lectotype. The specimen is mounted together with another *Schiede s.n.* collection, not considered as original material as it was collected on July 1829. A second specimen at W (W0024369) also shows an identical collecting label as the lectotype. Here an annotation “94 Schiede et Deppe” was added later. A clastotype annotated by Miquel in his herbarium in U (now in L) mentions Schiede as the collector without number.

Peperomia tlapacoyoensis C. DC. in Linnaea 37: 376. 1872.

Lectotypus (designated here): **MEXICO. Oaxaca:** St. Maria Tlapacoyo, V.1841, *Liebmann 102* (C [C10016496]!; isolecto-: G-DC [G00321697]!). **Syntypus:** **MEXICO. Oaxaca:** St. Maria Tlapacoyo, V.1841, *Liebmann 101* (C [C10016495]!).

Notes. – Two syntypes were cited in the protologue: *Liebmann 101* and *102* (both in C and in G-DC). *Liebmann 101* was not located in G-DC nor in G. *Liebmann 102* deposited in C is designated here as the lectotype as it is more complete than the G-DC sheet.

Peperomia urocarpoides C. DC. in Candollea 1: 362. 1923.

Lectotypus (designated by SCHROEDER, 1926: 135; second step designated here): **PANAMA**: Cerro de Garagara, Sambu Basin, S. Darien, 500–974 m, 2.II.1912, *Pittier 5670* (G-DC [G00321968]!; isolecto-: US [US00104928]!).

Notes. – As for the many new species described in key format by C. de Candolle [see CANDOLLE (1923) for an example], no type was designated. SCHROEDER (1926: 135) designated *Pittier 5670* from Panama as type collection but with no indication of a herbarium where the specimen was stored. A second-step lectotypification is therefore necessary. Both duplicates located in G-DC and in US were seen by C. de Candolle. The G-DC is designated here as the lectotype because it is the most complete collection.

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