SYNOPSIS AND TYPIFICATION OF NEW WORLD MEMBERS OF THE TRIBE CHIOCOCCEAE (RUBIACEAE, DIALYPETALANTHOIDEAE)

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ABSTRACT

The tribe Chiococceae *sensu* Paudyal et al. (2018) is a monophyletic group of 30 genera and ca. 210 species. The tribe has amphi-Pacific geographical disjunction between the Neotropics and the West Pacific, with ca. 160 species present in the Greater Antilles, which represents its center of diversity, ca. 25 species present in Central and South America, and 28–30 species in the South Pacific (Philippines, New Caledonia, Marianas to Melanesia and Tonga Islands). The tribe has been shown to be monophyletic by numerous molecular phylogenetic studies. Members of the Chiococceae are highly variable in habit, ranging from subshrubs, erect or scandent shrubs, vines, treelets to tall trees. Their flowers are also highly variable in shape and dimensions, with corolla tubes ranging from ca. 3 mm long (e.g., *Erithalis*) to 27 cm long (e.g., *Osa*), with stamens inserted near or at the base of corolla tube or on the disc, and with spinulose pollen. Fruits of this tribe are also variable, as they can be capsular, drupaceous, or baccate, and the seeds can be flat, polygonal or globose, included in pyrenes or not. A synopsis of the Neotropical taxa of the tribe is here presented. The generic delimitations adopted in this synopsis follow those of Paudyal et al. (2018). The objective of this synopsis is to present a complete synonymy and typification of all the names involved, and to provide the identity of all the names of Neotropical taxa. A total of 83 lectotypifications, 20 neotypifications, and 1 epitypification, are here presented. The new combinations **Coutaportla campanilla** (DC.) Delprete, **Scolosanthus crucifer** ssp. **microphyllus** (Borhidi) Delprete, **Solenandra coriacea** (Poir.) Delprete, **Solenandra parviflora** (Bonpl.) Delprete, and the new species **Scolosanthus nipensis** Borhidi ex Delprete, are here published. In the Neotropics, 27 genera, 183 species, 8 subspecies, and 2 varieties, are here recognized in the tribe, of which 16 genera, 83 species, 5 subspecies, and 1 variety occur in Cuba.

Key Words: Neotropics, Condamineeae, Catesbaeeae, nomenclature, Rubiaceae, typification

RESUMEN

La tribu Chiococceae *sensu* Paudyal et al. (2018) es un grupo monofilético de 30 géneros y ca. 210 especies. La tribu tiene una disyunción geográfica anfipacífica entre el Neotrópico y el Pacífico Occidental, con ca. 160 especies presentes en las Antillas Mayores, que representa su centro de diversidad, ca. 25 especies presentes en América Central y del Sur, y 28–30 especies en el Pacífico Sur (Filipinas, Nueva Caledonia, Marianas a Melanesia y las Islas Tonga). Se ha demostrado que la tribu es monofilética mediante numerosos estudios filogenéticos moleculares. Los miembros de Chiococceae son muy variables en hábito, desde subarbustos, arbustos erectos o escandentes, enredaderas, arbolitos hasta árboles altos. Sus flores también son muy variables en forma y dimensiones, con tubos de corola que van desde ca. 3 mm de largo (p. ej., *Erithalis*) a 27 cm de largo (p. ej., *Osa*), con estambres insertados cerca o en la base del tubo de la corola o en el disco, y con polen espinuloso. Los frutos de esta tribu también son variables, ya que pueden ser capsulares, drupáceos o bacados, y las semillas pueden ser planas, poligonales o globosas, incluidas en pirenos o no. Aquí se presenta una sinopsis de los taxones neotropicales de la tribu. Las delimitaciones genéricas adoptadas en esta sinopsis siguen las de Paudyal et al. (2018). El objetivo de esta sinopsis es presentar una sinonimia y tipificación completa de todos los nombres involucrados, y proporcionar la identidad de todos los nombres de los taxones neotropicales. Aquí se presenta un total de 83 lectotipificaciones, 20 neotipificaciones y 1 epitipificación. Se publican aquí las nuevas combinaciones **Coutaportla campanilla** (DC.) Delprete, **Scolosanthus crucifer** ssp. **microphyllus** (Borhidi) Delprete, **Solenandra coriacea** (Poir.) Delprete, **Solenandra parviflora** (Bonpl.) Delprete y la nueva especie **Scolosanthus nipensis** Borhidi ex Delprete. En el Neotrópico, se reconocen 27 géneros, 183 especies, 8 subespecies y 2 variedades de la tribu, de las cuales 16 géneros, 83 especies, 5 subespecies y 1 variedad se encuentran en Cuba.

Palabras claves: Neotrópico, Condamineeae, Catesbaeeae, nomenclatura, Rubiaceae, tipificación

The tribe Chiococceae *sensu* Paudyal et al. (2014, 2018) is a monophyletic group of 30 genera and about 210 species (Delprete & Motley 2003; Delprete 2004; Motley et al. 2005; Negron-Ortiz 2005; Borhidi 2007, 2008; Borhidi et al. 2009; Manns & Bremer 2010; Barrabé et al. 2011; Alejandro et al. 2014; Jardim et al. 2015; Franck

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et al. 2017; Paudyal et al. 2014, 2018). The tribe has amphi-Pacific geographical disjunction between the Neotropics and the West Pacific. Members of the Chiococceae are primarily distributed in the Neotropics, with a center of diversity in the Greater Antilles, where ca. 160 species are found; and ca. 25 species are distributed in Central and South America. Several species are widespread in the Neotropics and subtropical areas (e.g., *Chiococca alba* (L.) Hitchc., *Coutarea hexandra* (Jacq.) K. Schum.).

In the West Pacific, the Chiococceae are represented by *Bikkia* Reinward (1828:8), *Thiollierea* Montrouzier (1860:217), and *Badusa* A. Gray (1859:308). These three genera include a total of ca. 28–30 species, ranging from the Philippines, New Caledonia, Marianas to Melanesia and Tonga Islands (Motley et al. 2005; Manns et al. 2012; Govaerts et al. 2017; Barrabé et al. 2011; Paudyal et al. 2014, 2018; Barrabé & Fleurot 2021). The Pacific genera are not treated in the present synoptic treatment.

Motley et al. (2005) performed a molecular phylogenetic analysis of the Catesbaeeae-Chiococceae complex (CCC) using ITS and *trnL-F* sequences. They sampled 61 species, representing 24 of the 28 genera that they recognized in the CCC. The phylogenies obtained could not fully determine many relationships owing to poor branch support and polytomies. Their phylogenies confirmed the monophyly of *Catesbaea*, *Isidorea*, *Portlandia*, and *Scolosanthus*, and retrieved *Exostema*, *Solenandra*, *Bikkia*, and *Chiococca* as polyphyletic.

Manns and Bremer (2010), according to their molecular phylogenies, delimited the Chiococceae including *Strumpfia* with 26 other genera, supporting the conclusions of Bremer and Eriksson (2009). In that study, they tentatively included *Ceuthocarpus* and *Thogsennia* in the tribe, but did not include *Shaferocharis* Urb., although these three taxa were previously included in the group by Motley et al. (2005). They included *Eosanthe* in the Chiococceae, which was not included in the tribe by Motley et al. (2005).

Paudyal et al. (2014) studied the genetic divergences among the tribes of subfamily Dialypetalanthoideae (sensu Razafimandimbison & Rydin 2024, as "Cinchonoideae"), using *trnL-F* data, analyzed using maximum likelihood and Bayesian inference methods, and provided additional evidence for excluding *Strumpfia* from the Chiococceae, along with the striking morphological peculiarities, and included it in the monotypic tribe Strumpfieae. In *Strumpfia* the flowers are protogynous, buzz-pollinated, the anthers united into a synandrum, opening by a common apical pore, and the pollen grains have a verrucose exine. In the Chiococceae the flowers are not buzz-pollinated, the anthers are free from each other, and the pollen grains have a spinulose exine. In Paudyal et al. (2014), the tribe Chiococceae was re-delimited to include 29 genera, *Badusa*, *Bikkia*, *Catesbaea* (including *Phyllacanthus*), *Ceratopyxis*, *Ceuthocarpus*, *Chiococca* (including *Asemnantha*), *Coutaportla*, *Coutarea*, *Cubanola*, *Eosanthe*, *Erithalis*, *Exostema*, *Hintonia*, *Isidorea*, *Lorencea*, *Morierina*, *Nernstia*, *Osa*, *Phialanthus*, *Portlandia*, *Salzmannia*, *Schmidtottia*, *Scolosanthus*, *Shaferocharis*, *Siemensia*, *Solenandra*, *Thogsennia*, and *Thiollierea*.

Paudyal et al. (2018) performed the most comprehensive phylogenetic study of the Chiococceae using two nuclear (ETS, ITS) and two plastid (petD, *trnL-F*) datasets analyzed with Bayesian and Maximum Likelihood (ML) methods. The phylogenetic trees generated from the analyses of the combined dataset (all markers) resulted in the most fully resolved phylogeny. The majority rule consensus tree was used by Paudyal et al. (2018:fig. 3) for taxonomic decisions. That tree has four well-supported main clades, designated A to D. Each clade is discussed in detail below.

In Paudyal et al.'s (2018:fig. 3) analysis, clade A was strongly supported (BPP = 1.0, BS = 100) as sister to the remainder of Chiococceae. In this clade are positioned *Coutaportla* and *Lorencea*, genera endemic to Mexico and northern Central America. It should be noted that in the analyses using the combined dataset they were placed on a strongly supported clade, while in the analyses using only plastid data, these two genera were positioned on separate clades.

Clade B of Paudyal et al. (2018:fig. 3) included all the genera with capsular fruits and wind-dispersed seeds of the Chiococceae *sensu* Paudyal et al. (2014, 2018), namely *Coutarea*, *Exostema*, *Hintonia* and *Solenandra*. The monophyly of clade B was well supported (BPP = 0.93, BS = 62), and the monophyly of *Hintonia* was strongly supported, along with its close relationship with *Exostema sensu* McDowell (1996) and *Coutarea*. In the phylogenetic study of Paudyal et al. (2018:fig. 3), *Coutarea* and *Exostema* were not resolved as

monophyletic. Following the monophyletic groups detected within Clade B, Paudyal et al. (2018) recircumscribed three of these four genera (except *Hintonia*, which was maintained as traditionally delimited) and named three additional small genera, *Coutareopsis* Paudyal & Delprete, *Motleyothamnus* Paudyal & Delprete, and *Adolphoduckea* Paudyal & Delprete. In clade B, *Exostema*, as traditionally delimited, was confirmed to be paraphyletic, and required most taxonomic changes. In the well-supported (BPP = 0.86, BS = 63) subclade B1 were retrieved the species of *Exostema* with axillary inflorescences. This result agrees with the morphology-based delimitation of *E.* sect. *Exostema* of McDowell (1996). Because *E. caribaeum* (Jacq.) Roem. & Schult. is the type of the genus, Paudyal et al. (2018) treated the species of this clade as *Exostema* s.str., a genus of 8 species that occur in Cuba and Hispaniola, with the exception of *E. caribaeum*, which is also present in other Antillean islands, southern Florida, Mexico and Central America. The presence of axillary vs. terminal inflorescences is a significant character that has been used to define many genera in the Rubiaceae, and axillary inflorescence represents a strong morphological synapomorphy for *Exostema* s.str.

Still within clade B of Paudyal et al. (2018), a subset of the species traditionally positioned in *Exostema* were retrieved on the strongly supported (BPP = 1) subclade B4, which are all the species with terminal inflorescences, many short flowers per inflorescence, and (except for one species) represent the species of the "*E.* sect. *Pitonia*" of McDowell (1996). Paudyal et al. (2018) merged all the species present on subclades B4a and B4b into the expanded genus *Solenandra s.l.*, and published the necessary new combinations. The monophyly of *Solenandra* sensu Borhidi (2002) was retrieved in previous molecular studies (McDowell & Bremer 1998; McDowell et al. 2003; Manns & Bremer 2010; Manns et al. 2012). *Solenandra*, as delimited by Paudyal et al. (2018), is a genus of 22 species, characterized by terminal inflorescences, infundibular, white corollas, capsular fruits basipetally septicidal, placentas linear, narrowly ellipsoid to lanceolate, and winged seeds acropetally, centripetally or basipetally aligned. Paudyal et al. (2018) divided *Solenandra s.l.* into two sections: *S.* sect. *Solenandra* (12 spp.), with corollas 0.6–2.2(–3.0) cm long, turning pale yellow after anthesis, and *S.* sect. *Pitonia* (DC.) Paudyal & Delprete (10 spp.), with corollas 4–21 cm long, turning pink to maroon after anthesis.

Greuter and Rankin-Rodríguez (2021, 2022a) interpreted the clades within Clade B of Paudyal et al. (2018: fig. 3) differently than Paudyal et al. (2018), and instead of recognizing the phylogenetically and morphologically well supported genera, as delimited by Paudyal et al. (2018), opted to treat the entire Clade B as the broadly expanded, morphologically diverse genus *Exostema*. Their wide circumscription submerged the long-established genera *Coutarea* and *Hintonia*, as well as Paudyal et al.'s (2018) recently recognized segregated genera into a very broadly delimited *Exostema*. Because the genus *Coutarea* is positioned within Clade B, Greuter and Rankin-Rodríguez (2021) published a formal proposal (2831) to conserve the name *Exostema* against *Coutarea*, as the latter has nomenclatural priority.

Delprete and Paudyal (2023) in a rebuttal to Greuter and Rankin-Rodríguez's (2021, 2022a) proposal expressed their strong disagreement with naming the entire Clade B of Paudyal et al. (2018) as a widely expanded, highly heteromorphic *Exostema*, and their preference to recognize of the phylogenetically and morphologically well-supported genera of clade B. Greuter and Rankin-Rodríguez (2021), in their proposal, argued that the use of the name *Exostema* for all the species of clade B would require fewer new combinations than using the name *Coutarea* for the whole clade. Several additional arguments presented by Greuter and Rankin-Rodríguez (2021, 2022a) to recognize their expanded delimitation of *Exostema* are supported by erroneous information, and are amply discussed and contrasted in Delprete and Paudyal (2023). Greuter and Rankin-Rodríguez (2021, 2022a) supposed that the wide morphological variation present in their broadly delimited *Exostema* is mainly due to shift in pollination syndromes, without taking into account the strong set of additional morphological features that characterize each subclade within Paudyal et al.'s Clade B: inflorescence position, flower merosity, corolla symmetry, ovary placentation, style morphology, among many other characters. The rebuttal of Delprete and Paudyal (2023) to Greuter and Rankin-Rodríguez's proposal, was summarized as follows: "(1) The wide expansion of *Exostema* and the proposal to reject *Coutarea* vs. *Exostema* proposed by Greuter and Rankin-Rodríguez (2021, 2022a) is causing and will continue to produce disruption

in nomenclatural stability of traditional and current usage of generic and specific names within the Chiococceae; (2) The broad synonymization under *Exostema* s.l. proposed by Greuter and Rankin-Rodríguez (2021, 2022a) entails the lumping of six genera (*Adolphoduckea*, *Coutarea*, *Coutareopsis*, *Hintonia*, *Motleyothamnus*, *Solenandra*) under a broadly distributed, widely polymorphic genus, decreasing the value of the diagnostic information of each monophyletic taxon present in Paudyal et al.'s (2018) Clade B and reduces the systematic and morphological information of the species, as members of smaller monophyletic genera; (3) All the internal clades of clade B retrieved in Paudyal & al.'s (2018) phylogenies are well- to strongly supported, and each of them corresponds to a genus characterized by a unique set of morphological characters; (4) Paudyal & al.'s (2018) genera have been accepted by numerous Rubiaceae specialists and managers of specialized websites; (5) The broad circumscription of *Exostema* proposed by Greuter and Rankin-Rodríguez (2021, 2022a) does not fulfill the principle of maximizing the ease of identification of the ca. 40 species included in such a highly polymorphic genus, and therefore increases the difficulty of species identification by the botanical community." Following the above considerations, which are in agreement with the basic principles of classification adopted by the Angiosperm Phylogeny Group (1998), Delprete and Paudyal (2023) advised the Nomenclature Committee to reject Greuter and Rankin-Rodríguez's (2021) proposal to conserve the generic name *Exostema* against *Coutarea*. Whether the proposal to reject *Coutarea* vs. *Exostema* published by Greuter and Rankin-Rodríguez (2021) is recommended or not, and whether those authors will eventually proceed in publishing new combinations in either *Coutarea* or *Exostema*, to our knowledge, most Rubiaceae specialists will continue to recognize the genera of Clade B as delimited by Paudyal et al. (2018), with the obvious disruption in nomenclatural stability and in the traditional usage of generic names in this group.

Several examples of acceptance of the genera of Clade B as delimited by Paudyal et al. (2018) have been recently published. Borhidi et al. (2018) in an article focusing on additions and corrections to their floristic treatment of Cuban Rubiaceae (Borhidi et al. 2017), followed all generic delimitations proposed by Paudyal et al. (2018), recognizing the genera *Solenandra sensu* Paudyal & Delprete, *Exostema sensu* Paudyal & Delprete, *Adolphoduckea*, and *Motleyothamnus*. Torres-Montúfar et al. (2022) in a synopsis of the Chiococceae occurring in Mexico, recognized *Coutarea*, *Exostema*, *Hintonia*, and *Solenandra* as delimited by Paudyal et al. (2018). Torres-Montúfar et al. (2023) recognized the South-American genera *Adolphoduckea*, *Coutareopsis*, and *Motleyothamnus* as delimited by Paudyal et al. (2018). The multi-authored internet site *Flora e Funga do Brasil* (2024) recognized *Adolphoduckea* and *Coutarea* occurring in Brazil as delimited by Paudyal et al. (2018). The multi-authored website *Plants of the World Online* (POWO, 2024) accepted all the genera of the Chiococceae as delimited by Paudyal et al. (2018). The generic delimitations of Paudyal et al. (2018) in clade B, are followed in the present treatment.

Clade C of Paudyal et al. (2018:fig. 3), also called the *Catesbaea-Portlandia* clade, was strongly supported (BPP = 1.0, BS = 100) as monophyletic and comprised *Catesbaea*, *Cubanola*, *Isidorea*, *Nernstia*, *Osa*, *Phyllacanthus*, and *Portlandia*. Based on a phylogenetic analysis using morphological characters, Delprete (1996) included these seven genera into an expanded Catesbaeeae, with eight other genera of Chiococceae, i.e., *Bikkia*, *Ceuthocarpus*, *Coutaportla*, *Coutarea*, *Hintonia*, *Schmidtottia*, *Siemensia* and *Thogsennia*. However, *Thogsennia* has not been included in any molecular phylogenetic studies, including that of Paudyal et al. (2018), because it is an extremely rare, monotypic genus from eastern Cuba, only known by a few old collections. The genera of clade C were already resolved as one clade in several previous studies (Rova et al. 2002; Motley et al. 2005; Robbrecht & Manen 2006; Manns & Bremer 2010; Manns et al. 2012). Aiello (1979) segregated *Osa* from *Hintonia*, and *Cubanola* and *Nernstia* (as *Cigarrilla*) from *Portlandia* based mainly on placentation and seed characters. She distinguished *Osa* from *Hintonia* as having large wingless seeds (vs. small winged seeds in *Osa*) with tuberculate testa (vs. reticulate) and persistent funicle (vs. non-persistent), long trumpet-shaped corollas (vs. funnelform) and large leaves with attenuate apex (vs. medium-sized leaves with acute to acuminate apex). Similarly, Aiello (1979) distinguished *Cubanola* from *Portlandia* in having reticulate to foveate seeds (vs. tuberculate in *Portlandia*) and non-persistent funicle (vs. persistent), loculicidally and septicidally dehiscent capsule (vs. basipetally loculicidally dehiscent), placenta circular in cross section (vs.

linear and adnate to septum), and chartaceous to subcoriaceous leaves (vs. coriaceous). *Nernstia* is distinguished from *Portlandia* in having colliculate seeds (vs. tuberculate) with acropetally imbricate arrangement and non-persistent funicle (vs. persistent) and large, spongy placenta (vs. linear, adnate to the septum). All Aiello's segregations are supported by the molecular phylogenies of Paudyal et al. (2018). The monotypic *Nernstia*, endemic to Mexico, and *Osa*, endemic to Central America, are resolved on a strongly supported clade (subclade C2), sister to the *Catesbaea-Portlandia-Isidorea* clade. *Cubanola*, a genus of two species endemic to Cuba and Hispaniola, was placed as sister to all the other genera of the clade. These relationships are similar to those retrieved in the molecular phylogenetic trees of Motley et al. (2005) and Manns & Bremer (2010).

Catesbaea, a genus of 17 species occurring in the Florida Keys, Bahamas, and the Antilles, in Paudyal et al. (2018) formed a strongly supported clade (BPP = 1.0, BS = 100) with *Phyllacanthus* Hook.f. nested in it, corroborating several previous molecular phylogenetic studies (Rova et al. 2002; Motley et al. 2005; Robbrecht & Manen 2006; Manns & Bremer 2010; Manns et al. 2012). *Phyllacanthus* was segregated from *Catesbaea* by Hooker (1871) because of its large, laterally flattened, triangular thorns and uniseriate ovules. Aside from these characters, the two genera are morphologically similar. Although the analysis of Paudyal et al. (2018) using combined data resolved a different relationship, based on their *trnL-F* results and morphological similarity with *C. flaviflora* Urb., which has flowers almost identical to those of *P. grisebachianus* Hook.f., *Phyllacanthus* is here treated as a synonym of Catesbaea.

Portlandia, positioned in subclade C4, is a genus of six species endemic to Jamaica (Delprete & Motley, 2003). In Paudyal et al.'s (2018) study it formed a strongly supported monophyletic clade (BPP = 1.0, BS = 100), sister to the *Isidorea* clade. The sister relationship of *Portlandia* and *Isidorea* was already shown in previous phylogenetic studies (Delprete 1996; Rova et al. 2002; Delprete & Motley 2003; Motley et al. 2005; Robbrecht & Manen 2006; Manns & Bremer 2010).

Isidorea, retrieved in subclade C5 of Paudyal et al.'s (2018) study, is a genus of 13 species endemic to Cuba and Hispaniola. It was strongly supported to be monophyletic (BPP = 1.0, BS = 100). It differs from *Portlandia* in having stiff, pungent, coriaceous leaves and stipules divided at the base into two units, looking like four, apically pungent, stipules per node (Aiello, 1979). Paudyal et al. (2018) included ten *Isidorea* species in their study, six of which were not included in previous phylogenetic analyses. The *Isidorea* clade was divided into two subclades, one with the species from Cuba (subclade C5a), and the other with the species from Dominican Republic (subclade C5b).

Clade D of Paudyal et al. (2018) was strongly supported (BPP = 1.0, BS = 100) as monophyletic, and included 14 genera, namely *Badusa*, *Bikkia*, *Ceratopyxis*, *Ceuthocarpus*, *Chiococca*, *Eosanthe*, *Erithalis*, *Morierina*, *Phialanthus*, *Salzmannia*, *Schmidtottia*, *Scolosanthus*, *Siemensia* and *Thiollierea*. These genera were retrieved in five strongly supported subclades (subclades D1–D5). Several genera of this clade are endemic to Cuba (*Ceratopyxis, Ceuthocarpus, Eosanthe, Schmidtottia, Siemensia*), some others occur in Cuba and other Antilles (*Erithalis, Phialanthus, Scolosanthus*), two are widespread in the Neotropics (*Chiococca*, *Salzmannia*), and four occur in the western Pacific region (*Badusa*, *Bikkia, Morierina*, *Thiollierea*). Corolla shapes, sizes and fruit types vary greatly among members of this clade, showing no distinct pattern in the evolution of these characters and supporting the evolutionary plastic nature of them. Although clade D is strongly supported as monophyletic (BPP = 1.0, BS = 100), the relationships between the five subclades were not well supported in Maximum Likelihood analysis (ML; BS < 70), and these subclades formed an unresolved grade. The genera mentioned above are also grouped as a monophyletic alliance in most of the previous molecular studies (Rova et al. 2002; Motley et al. 2005; Robbrecht & Manen 2006; Manns & Bremer 2010; Manns et al. 2012); however, they did not form a monophyletic group in Bremer & Eriksson (2009).

In Paudyal et al.'s (2018) molecular analysis, the genera previously included in the Chiococceae by Hooker (1873a) are found on clade D, which divided into two separate clades: clade D5, with *Chiococca* (including *Asemnantha*), *Erithalis*, *Salzmannia* and *Scolosanthus*; and clade D2, with *Phialanthus*, *Ceratopyxis*, *Ceuthocarpus*, *Eosanthe* and *Schmidtottia* (the last four endemic to Cuba). The four genera from the western Pacific islands, *Badusa*, *Bikkia*, *Morierina* and *Thiollierea*, were found in two separate clades (subclades D1 and

D4). *Morierina* and *Thiollierea*, endemic to New Caledonia, formed a strongly supported monophyletic clade (BPP = 1.0, BS = 100; subclade D1) with the morphologically distinct *Morierina* nested in *Thiollierea*. *Morierina montana* Vieill. is a large tree with narrowly tubular corollas, found in forested area, whereas *Thiollierea* species are shrubs with large, colorful, campanulate flowers, growing in scrub coastal vegetation on ultrabasic soils (Motley et al. 2005). Bremer (1992) and Delprete (1996), due to the overall morphological similarity of *Morierina* and *Exostema*, e.g., corollas with long-narrow tube and reflexed lobes, in their phylogenetic analyses using morphological data retrieved the two genera as sister taxa. Motley et al. (2005) were the first to include *Morierina* in a molecular phylogenetic analysis and found it to be nested in the *Thiollierea* clade. *Thiollierea* was resurrected by Barrabé et al. (2011) to include ten species endemic to New Caledonia, which were previously placed in *Bikkia*. They amended *Thiollierea* mostly following the molecular analysis of Motley et al. (2005), further supported by the morphological data presented in Barrabé et al. (2011). The characters that they used to distinguish *Thiollierea* from *Bikkia s.s.* are: anthers that twist at anthesis (vs. not twisting in *Bikkia*), sheathing, truncate stipules (vs. free, acuminate), flat ovules (vs. globose), drooping inflorescence (vs. erect) and flat seeds (vs. angular or diamond-shaped). Despite acknowledging the fact that *Morierina* in molecular phylogenetic trees is nested in *Thiollierea*, Barrabé et al. (2011) refrained from adequately addressing its systematic position within *Thiollierea*, as shown by Motley et al. (2005). Paudyal et al. (2018) were unable to include in their study the second species of *Morierina*, *M. propinqua* Brongn. & Gris, which is probably extinct. However, they felt that *Morierina* is another example of extreme morphological variation in a single genus present in this tribe. Although only one species was included in their analysis, Paudyal et al. (2018) transferred both *Morierina* species to *Thiollierea*, and published the necessary new combinations.

The molecular phylogenies of Paudyal et al. (2018) resolved the four Cuban endemics *Ceuthocarpus*, *Ceratopyxis*, *Eosanthe* and *Schmidtottia* and the West Indian genus *Phialanthus* on the strongly supported subclade D2 (BPP = 1.0, BS = 92). This result supported the same relationships retrieved in the molecular studies of Rova et al. (2002), Motley et al. (2005), Bremer and Eriksson (2009), and Manns and Bremer (2010), although it contradicted the phylogenetic trees produced by Robbrecht and Manen (2006), in which *Eosanthe* was placed in a different position.

Urban (1923a) segregated *Schmidtottia* from *Portlandia* because of its terminal inflorescence (vs. lateral in *Portlandia*), sheathing, truncate stipules (vs. interpetiolar, triangular), septicidal capsules (vs. loculicidal) and ovate to obovate placenta (vs. linear). Paudyal et al. (2018) included seven *Schmidtottia* species in their phylogenetic study. Those species were found on a strongly supported (BPP = 1.0, BS = 100) clade along with *Ceuthocarpus involucratus* (Wernham) Aiello. Because *Ceuthocarpus* was nested within the *Schmidtottia* clade, Paudyal et al. (2018) returned *Ceuthocarpus* to *Schmidtottia*, in agreement with Alain (1959).

Paudyal et al. (2018) confirmed the placement of *Ceratopyxis* within the Chiococceae, another Cuban endemic monotypic genus, as sister to the *Phialanthus-Eosanthe* clade. *Ceratopyxis* has been positioned as sister to *Phialanthus* in most previous studies, except those produced by Manns & Bremer (2010), where *Schmidtottia* and *Phialanthus* were retrieved as sister genera, with no support value stated. *Phialanthus*, a genus of 22 species occurring in the Bahamas and the Greater and Lesser Antilles, was already positioned in the Chiococceae *s.s.* by Hooker (1873a). Bremer (1992) excluded it from the amended Chiococceae citing the presence of free filaments, but later Rova et al. (2002) showed that it is closely related to other members of Chiococceae. In Motley et al. (2005), *Phialanthus* was supported to be monophyletic.

Paudyal et al. (2018) included nine species of *Phialanthus* in their phylogenetic study, and in both combined and separate analyses using plastid and nuclear datasets, this genus was retrieved as non-monophyletic. Eight species of *Phialanthus* were found on one clade forming a trichotomy with *Eosanthe* and *Phialanthus hispaniolae* Alain & R.G.García as sister taxa in a strongly supported Subclade D2c (BPP = 1.0, BS = 100). Delprete (1999a), based on morphological observations, pointed out that *Eosanthe* is similar to *Phialanthus* because of the sheathing stipules, axillary inflorescence, persistent four-lobed calyx, filaments not connate to the corolla tube and the two-seeded indehiscent fruits. Delprete (1999a) also indicated that due to the resinous branches, thick coriaceous leaves, foliose calyx lobes, ridged corolla tube, and linear-oblong anthers,

Eosanthe is also similar to *Schmidtottia*. *Eosanthe* differs from *Schmidtottia* by the solitary, axillary flowers and two-seeded pseudosamaras, whereas the latter has terminal, few-flowered inflorescence and many-seeded capsules. The molecular phylogenies of Paudyal et al. (2018) are in agreement with Delprete's morphological observations, but they were able to include only the sequence data of *Eosanthe* of two DNA regions in their analyses. *Eosanthe* is an extremely rare, monospecific genus, endemic to eastern Cuba (Sierra de Cristal, 1200–1300 m), known only from the type specimens and one additional collection from the same locality, collected in 1916 and 1922, respectively, with foliaceous, bright orange-red calyx lobes, yellow corolla, and fruits that are narrowly winged pseudo-samaras (due to the persistent calyx lobes), which is a unique fruit type in the tribe. Whereas, all species of *Scolosanthus* have minute, green calyx lobes, white (rarely yellowish-white) corollas, and fleshy drupes with woody pyrenes. Paudyal et al. (2018) due to the limitation in sequence data and the striking difference in flower and fruit morphology of these two genera, preferred to keep *Eosanthe* separated from *Phialanthus*.

The molecular phylogenies of Paudyal et al. (2018) were unable to fully ascertain the phylogenetic position of *Siemensia*, a monotypic genus endemic to western Cuba. Their phylogenetic analysis contradicted some earlier morphological studies (Aiello 1979; Delprete 1996) that positioned *Siemensia* as associated with *Portlandia*. In their subclade D3 of the combined analysis, *Siemensia* was resolved as sister to the *Badusa-Bikkia* clade, although not strongly supported by the ML analysis. It was instead strongly supported as sister to the *Thiollierea-Morierina* clade in the phylogenetic trees using nuclear datasets. Whereas, in the phylogenetic trees using plastid datasets, it was resolved in a trichotomy with the *Badusa-Bikkia* clade and *Chiococca-Scolosanthus* clade as sister clades. The ML analysis also placed *Siemensia* as sister to *Thiollierea-Morierina* clade but with poor support (BS = 37), which placed *Siemensia* together with Pacific genera in an unresolved grade with the other genera in the clade. The same contrasting relationships were retrieved by Motley et al. (2005) in separate analyses using *trnL-F* and ITS sequences.

In Paudyal et al.'s (2018) phylogenetic analysis, the widespread genera of the western Pacific islands, *Badusa* and *Bikkia s.s.* (excluding the species transferred to *Thiollierea*) were positioned on a strongly supported subclade D4 (BPP = 1.0, BS = 100). *Badusa* is morphologically distinct from *Bikkia* in having short-tubular, pentamerous flowers and fusiform capsules, whereas *Bikkia* has large, funnel-shaped, tetramerous flowers and subcylindrical, costate capsules (Fosberg et al. 1993; Motley et al. 2005). Ridsdale (1982) and Delprete (1996) associated *Badusa* with *Exostema* and *Morierina* based on a set of morphological characters, e.g., tubular flowers with narrowly oblong imbricate corolla lobes, anthers basally attached to filaments, and dorsoventrally flattened seeds, but this was not supported in Paudyal et al.'s (2018) analysis.

Chiococca, as traditionally delimited, is a genus of about 25 species occurring throughout the Neotropics, with the center of diversity in Mexico, Central America, and the Caribbean Region. Motley et al. (2005) and Manns & Bremer (2010) indicated that *Chiococca* is paraphyletic with *Asemnantha* nested in it. Borhidi (2011), following those molecular phylogenies and additional morphological observations, synonymized *Asemnantha* with *Chiococca*, and proposed the new name *C. motleyana* Borhidi. Paudyal et al.'s (2018) results, as expected, supported that merging ["merging" is ok, but I would prefer "merger"]. In addition, by increasing taxa sampling to 17 species, Paudyal et al. (2018) retrieved new relationships in *Chiococca*. Their phylogenetic analysis showed that *Chiococca* (including *Asemnantha*) is not monophyletic, and retrieved a well-supported monophyletic group, subclade D5, with *Erithalis*, *Salzmannia* and *Scolosanthus*. In Paudyal et al.'s (2018) analysis, 14 species of *Chiococca* were resolved in subclade D5a. At the same time, three species of *Chiococca*, i.e , *C. cubensis* Urb. (endemic of Cuba), *C. naiguatensis* Steyerm. (from coastal cordillera of Venezuela) and *C. plowmanii* Delprete (from coastal dunes of Brazil; Delprete 2005), were found on a strongly supported (BPP = 1.0, BS = 93) clade (subclade D5a), along with two species of *Salzmannia* (coastal dunes of Brazil; Jardim et al. 2015, sympatric with *C. plowmanii*). Hence, Paudyal et al. (2018) made the necessary new combinations to unite these species under *Salzmannia*.

Paudyal et al. (2018), include 12 species of *Scolosanthus* in their analysis, which, within clade D, further confirmed the monophyly of this genus, in the strongly supported (BPP = 1.0, BS = 99) in subclade D5e, as

already suggested by Motley et al. (2005). *Scolosanthus* is a genus of about 27 species occurring in the Bahamas and Greater and Lesser Antilles.

Chiococca cubensis, a species endemic to Cuba, in Paudyal et al.'s (2018) analysis was retrieved on the strongly supported (BPP =1) subclade D5d, as a sister taxon to *Scolosanthus*, in the combined and nuclear phylogenies, while in those using the plastid dataset *C. cubensis* was nested within the *Scolosanthus* clade. In their analyses, the *Scolosanthus*-*C. cubensis* clade is sister to the *Salzmannia* clade. *Chiococca cubensis* is similar to *Salzmannia*, as delimited by Paudyal et al. (2018), by the tubular-subcylindrical corollas, from which it differs by the branches without resinous exudate (vs. with resinous exudate), cymose inflorescence (vs. subcapitate or small racemes), corollas deep purple-brown outside and yellow inside (vs. white, pale yellow, yellow orangish-yellow to greenish) and by being endemic to Cuba (vs. occurring in coastal cordillera of Venezuela and coastal Brazil). *Chiococca cubensis* differs from *Scolosanthus* by being a scandent or climbing shrub lacking thorns [vs. erect shrubs with bifurcate or trifurcate thorns (rarely unarmed) in *Scolosanthus*]. In addition, *C. cubensis* can be distinguished from most *Chiococca* species in having corollas tubular-subcylindrical, purple-brown outside and yellow inside (vs. campanulate to funnelform, white, cream-white to pale yellow throughout in *Chiococca*, with the exception of *C. rubriflora* Lundell, from southern Mexico and Guatemala, which has corollas red outside and orange inside). Hence, Paudyal et al. (2018) transferred *C. cubensis* to the new genus *Ramonadoxa* Paudyal & Delprete, along with the necessary new combination, and treated it as a sister genus of *Scolosanthus*.

In clade D of Paudyal et al. (2018), *Erithalis* was retrieved as monophyletic on the strongly supported subclade D5b (BPP = 1.0, BS = 98), corroborating previous phylogenetic analyses (Negron-Ortiz & Watson 2002, 2003; Motley et al. 2005; Manns & Bremer 2010).

In conclusion, Paudyal et al. (2018), according to the results of the molecular phylogenetic analyses, recognized the following Neotropical genera in the Chiococceae: *Adolphoduckea* Paudyal & Delprete (1 sp.), *Catesbaea* L. (including *Phyllacanthus* Hook.f., 17 spp.), *Ceratopyxis* Hook.f. (1 sp.), *Chiococca* P. Browne (22 spp.), *Coutaportla* Urb. (5 spp.), *Coutarea* Aubl. (2 spp.), *Coutareopsis* Paudyal & Delprete (3 spp.), *Cubanola* Aiello (2 spp.), *Eosanthe* Urb. (1 sp.), *Erithalis* (9 spp.), *Exostema* (Pers.) Rich. (8 spp.), *Hintonia* Bullock (3 spp.), *Isidorea* A. Rich. ex DC. (13 species), *Lorencea* Borhidi (1 sp.), *Motleyothamnus* Paudyal & Delprete (1 sp.), *Nernstia* Urb. (1 sp.), *Osa* Aiello (1 sp.), *Phialanthus* Griseb. (22 spp.), *Portlandia* P. Browne (6 spp.), *Ramonadoxa* Paudyal & Delprete (1 sp.), *Salzmannia* DC. (4 spp.), *Schmidtottia* Urb. (including *Ceuthocarpus* Aiello, 11 spp.), *Scolosanthus* Vahl (27 spp.), *Shaferocharis* Urb. (3 spp.), *Siemensia* Urb. (1 sp.), *Solenandra* Hook.f. *s.l.* (14 spp.), and *Thogsennia* Aiello 1 sp.). The Paleotropical genera included in the Chiococceae by Paudyal et al. (2018) are *Badusa* A. Gray (3 spp.), *Bikkia* Reinw. (11 spp.), and *Thiollierea* Montrouz. (including *Morierina* Vieill., 12 spp.), and are not addressed in the present synopsis.

Members of the Chiococceae *sensu* Paudyal et al. (2014, 2018) are highly variable in habit, ranging from subshrubs, erect or scandent shrubs, vines, treelets to tall trees. This group is also highly variable in flower shape and dimensions, having corolla tubes ranging from ca. 3 mm long (e.g., *Erithalis* P. Browne) to 27 cm long (e.g., *Osa* Aiello). This wide corolla variation is sometimes present even within the genus *Catesbaea* L. (including *Phyllacanthus* Hook.f.), as some of its species have large, funnel-shaped corollas with tubes 13–20 cm long (e.g., *C. spinosa* L.) and, at the other extreme, some species have small, campanulate corollas with tubes 5–7 mm long (e.g., *C. parviflora* Sw.). Fruits in this tribe are also highly variable, as they can be capsular, drupaceous, or baccate. Seeds can be flat, polygonal or globose, included in pyrenes or not, and winged or unwinged.

There is no single morphological synapomorphy to distinguish the Chiococceae *sensu* Paudyal et al. (2014, 2018), and only a combination of two homoplasious characters can be used to define this group: (1) stamens inserted near or at the base of corolla tube or on the disc and (2) presence of spinulose pollen (Huysmans et al. 2000; Motley et al. 2005). However, neither of these characters is peculiar to this tribe. Basal stamen insertion, although a rare character state in Rubiaceae, is also found in other groups in subfamily Dialypetalanthoideae (sensu Razafimandimbison & Rydin 2024), e.g., in the tribe Hamelieae, in *Chione* DC.

(tribe Chioneae; Razafimandimbison & Rydin 2024), and in *Neobertiera* Wernham (tribe Sipaneeae; Delprete 2015a, 2022). Other Rubiaceae taxa also have spinulose pollen, e.g., some species in the tribe Spermacoceae (Dessein et al. 2002), in subfamily Rubioideae (sensu Razafimandimbison & Rydin 2024).

Placocarpa J.D. Hook. is a monospecific genus endemic to Mexico, which remains with dubious position within the Rubiaceae, as it was included or excluded from the Chiococceae by different authors. Joseph Dalton Hooker (1873a:107–108) published *Placocarpa* Hook.f. with a sole species, *P. mexicana* Hook.f., and cited the material studied as "Mexici incola, prope Orizaba, a Broterio detecta." The collector of the material cited is the naturalist Matteo Botteri (1808–1877). Hooker positioned *Placocarpa* in the Chiococceae, where it was maintained by Robbrecht (1988, 1994). Delprete (1996) based on a phylogenetic analysis using morphological characters, positioned it in the Chiococceae-Catesbaeeae-*Exostema* complex, as a genus related to *Scolosanthus*. Huysmans et al. (1999), based on palynological characters, excluded *Placocarpa* from the Chiococceae-Catesbaeeae-*Exostema* complex because of the reticulate-columellate exine, while the genera of the Chiococceae have microechinate pollen grains. The sheet of *Botteri 913* at K, barcode K000432683, has a several pencil sketches by J.D. Hooker, depicting the foliaceous calyx lobes, corollas with cylindrical tube and four round lobes, stamens inserted near the corolla mouth, and ovary with two pendulous ovules. Borhidi (2006, 2012) treated *Placocarpa* in his two editions of *Rubiáceas de México*. In the first edition, Borhidi (2006) included it in the Chiococceae. In the second edition (Borhidi 2012), he did not suggest any systematic position, and described its fruits as splitting into two indehiscent cocci. *Placocarpa* has never been included in any molecular phylogenetic analysis. Because of pollen grains with reticulate-columellate exine (i.e., not microechinate), and the fruit splitting into two indehiscent cocci, I exclude it from the Chiococceae sensu Paudyal et al. (2014, 2018), and its systematic position within the Rubiaceae remains to be tested.

MATERIAL AND METHODS

The generic delimitations this synopsis follow those of Paudyal et al. (2018). This study is based on examination of herbarium specimens, material preserved in 60% ethanol, and field observations. Herbarium specimens were studied either on site or through loans from the B, B-W, BBS, BM, BR, BRB, C, CAY, COL, F, FI, G, G-DC, HAC, HAJB, HAL, IAN, INPA, K, L, LINN-SM, M, MBM, MG, MO, MPU, NY, P, P-AD, P-BONPL, P-JJR, P-JU, P-LA, R, RB, U, UMP, US, and VEN herbaria. Digital images of herbarium specimens were analyzed through the following websites:

- Jstor Global Plants (https://plants.jstor.org/),
- Reflora – Brazilian Plants: Historic Rescue and Virtual Herbarium for Knowledge and Conservation of the Brazilian Flora (http://reflora.jbrj.gov.br/reflora/PrincipalUC/PrincipalUC.do?lingua=en),
- INCT – Herbario Virtual da Flora e Fungos (http://inct.splink.org.br/),
- JACQ (https://www.jacq.org/#),
- Smithsonian National Museum of Natural History (https://collections.nmnh.si.edu/search/botany/),
- NYBG C.V. Starr Virtual Herbarium (https://sweetgum.nybg.org/science/vh/),
- CJBG – Conservatoire et Jardin de la Ville de Genève (https://www.ville-ge.ch/musinfo/bd/cjb/chg/advanced.php?lang=fr),
- BoGART – The Inventory Database of the Botanical Garden of Berlin-Dahlem (https://ww2.bgbm.org/bogartdb/BogartPublic.asp),
- BR virtual herbarium Plantentuin Meise (https://www.botanicalcollections.be/#/en/search/specimen),
- virtual herbarium of the Muséum National d'Histoire Naturelle of Paris (https://science.mnhn.fr/institution/mnhn/collection/p/item/search/form?lang=en_US),
- Type Database of the Herbarium of Göttingen (https://gwdu64.gwdg.de/pls/herbar/typen$.startup),
- Sweden's Virtual Herbarium (http://herbarium.emg.umu.se/index.html).

Barcode numbers of herbarium specimens, when available, are cited in square brackets after the herbarium code; when the barcode number is not available, the accession number, is cited preceded by "No." in square brackets.

Important information about the history of Cuban herbaria and their codes, collection numbers, accession numbers, and series numbers of specimens preserved in them is available in Regalado Gabancho et al. (2008). The HAC herbarium specimens do not have barcode numbers or accession numbers. Hence the HAC type specimens are here described in detail, in order to distinguish the type specimens of the same gathering

in HAC. The LS and SV herbaria have been integrated in HAC, with some duplicates in HAJB. The original herbaria of LS and SV is specified when citing type specimens, to unequivocally indicate a given specimen. Many botanical collectors who worked in Cuba did not use collection numbers. Specimens without collection number that were included in HAJB, were assigned HAJB accession numbers and barcode numbers.

Information about collecting localities in Cuba was obtained from the *Diccionario Geográfico de Cuba* (Comisión Nacional de Nombres Geográficos, 2000).

All specimens cited have been examined, unless indicated by "n.v." (not seen) after the herbarium code.

Information about collection dates and localities of specimens gathered by Martius in Brazil were obtained from the text and the maps available in Spix and Martius (1976). Pohl's collection dates and localities in Brazil were obtained by Pohl's (1976) travel diary.

SYSTEMATIC TREATMENT

ADOLPHODUCKEA

Poeppig (1841:31–32) published *Exostema maynense* Poepp. and provided a detailed description of the species. Among the numerous features described, he wrote that this species is a beautiful tree, to 60 feet tall (ca. 18 m tall), with very hard, reddish wood, persistent, ovate stipules, terminal, corymbose inflorescences, corolla tube 4.5 inches long (ca. 11.5 cm long), with tube distally infundibuliform and linear lobes, exserted stamens and style, obovate capsules with persistent calyx, and oblong, compressed, winged seeds.

In the phylogenetic study of Paudyal et al. (2018:fig. 3), *Exostema maynense* was retrieved on a strongly supported clade with *Coutarea hexandra*. These two species are similar in having terminal inflorescences and 6-merous flowers; the former differs from the latter by having cymose inflorescences (vs. simple or compound dichasia in *C. hexandra*), actinomorphic flowers (vs. zygomorphic), oblong corolla lobes (vs. ovate-deltoid), equal stamens (vs. unequal, sigmoidal), and capsules weakly laterally compressed (vs. strongly laterally compressed), occurring at 120–500(–1100) m from Ecuador to Bolivia (vs. from near sea level to 500 (–850) m, distributed throughout the Neotropics, from Mexico to Argentina). Based on these differences, Paudyal and Delprete transferred *Exostema maynense* to the monospecific genus *Adolphoduckea* Paudyal & Delprete, a name dedicated to Adolpho Ducke (1876–1959), the famous naturalist who worked in the Amazon Basin for most of his life, and collected and described hundreds of insects and plants.

Adolphoduckea can be distinguished from *Exostema sensu* Paudyal et al. (2018) by its terminal inflorescences (vs. axillary in *Exostema*), 6-merous flowers (vs. 4- or 5-merous), calyx lobes broad, long, with obtuse tip (vs. short, with acute tips), strongly flattened capsules (vs. slightly flattened), and by being a tree 10–30 tall, found in the lowland forests of the western Amazon basin (vs. shrubs or small trees, 1–6(–10) m tall, occurring in Cuba and Hispaniola, and *E. caribaeum*, distributed in other Antilles, Mexico, and Central America). For a complete description of the genus, see Paudyal et al. (2018:385).

Adolphoduckea is similar to *Solenandra sensu* Paudyal et al. (2018) in having terminal inflorescence and narrowly cylindrical corolla tubes; the former differs from the latter in having 6-merous flowers (vs. 5-merous), laterally compressed capsules (vs. not laterally compressed, terete), and seeds acrobasipetally arranged (vs. acropetally, centripetally or basipetally arranged), and by being a large tree growing in the western Amazon Basin (vs. subshrubs, shrubs or trees ranging from Mexico and Central America, to the Greater and Lesser Antilles).

Adolphoduckea is also similar to *Motleyothamnus* Paudyal & Delprete in having terminal inflorescence, laterally compressed capsules and acrobasipetal seed arrangement; the former differs from the latter in having 6-merous flowers (vs. 5-merous), corollas that turn pink to maroon with age (vs. turning pale yellow), and by being a tall tree that grows in the forests in lowland or at low elevations of the western Amazon Basin (vs. shrub growing in open places and shrublands of the Andes, at 1000–2800 m elevation).

Adolphoduckea is a monospecific genus, endemic to Amazonian lowlands of Ecuador, Peru, and Bolivia, occurring at 120–500(–1100) m elevation

Adolphoduckea Paudyal & Delprete, Bot. J. Linn. Soc. 187:384. 2018. Type: *Adolphoduckea maynense* (Poepp.) Paudyal & Delprete

1. Adolphoduckea maynense (Poepp.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:385. 2018. *Exostema maynense* Poepp. (as '*Exostemma*'), Nov. Gen. Sp. Pl. 3(3–4):31, tab. 237. 1841; Delprete in Andersson, Fl. Ecuador 62:51–53, f. 17. 1999 (as *Exostema maynense*). Type: PERU. Loreto: "crescit in sylvis primaevis provinciae Maynas et Yurimaguas," 1831, *E.F. Poeppig 2392* (lectotype (Delprete 1999b:51): NY [00077350]; isolectotypes: W-Rchb. [No. 1189-0294658], W [No. W0049010]).

***Distribution.*—**Ecuador, Peru, and Bolivia.

CATESBAEA

Linnaeus (1753:109) described *Catesbaea spinosa* L., and dedicated the genus name to Mark Catesby (1683–1749), the famous English naturalist, who studied plants and animals (mostly birds) in North America and the West Indies. *Catesbaea* was historically treated as a member of the tribes Gardenieae (e.g., Candolle, 1830; Baillon, 1880, 1881) or Catesbaeeae (e.g., Hooker, 1873a; Verdcourt, 1958), due to its multi-seeded, succulent fruits. Robbrecht and Puff (1986) excluded it from Gardenieae, and Robbrecht (1988) listed it among the "genera incerte sedis." Delprete (1996) included it in the *Portlandia* group, in which it is an eccentric genus. Huysmans et al. (1999) confirmed its position within the Catesbaeeae-Chiococceae-*Exostema* complex because of its spinulose pollen. Its position in the Chiococceae and its monophyly (including *Phyllacanthus*) was shown by Paudyal et al. (2014, 2018). *Catesbaea* has never been the subject of a monographic treatment. It displays a wide variation in shape and size of the corollas, the smallest are found on *C. parviflora* Sw., which has corolla tubes 5–7 mm long, and the largest ones in *C. spinosa* L , which has corollas tubes 13–20 cm long. Liogier (1962, 1995) published keys to the nine species occurring in Cuba (1962), and to the seven species occurring in Hispaniola (1995). Borhidi (2017) in *Rubiáceas de Cuba*, stated that *Catesbaea* is genus of about 30 species, 9 of them occurring in Cuba. In the present study, it is recognized as a genus of 17 species, 10 of which occurring in Cuba, of shrubs, with acicular thorns at nodes, and baccate, multi-seeded fruits, ranging from southern Florida, the Bahama Archipelago, to the Greater and Lesser Antilles.

Catesbaea L., Sp. Pl. 109. 1 May 1753; Standley, N. Amer. Fl. 32(3):209–214. 1934; Liogier, Fl. Cuba 5:68–70. 1962; Correll & Correll, Fl. Bahama Arch.: 1380–1383. 1982; Howard, Fl. Lesser Antill. 6(3):396–397. 1989; Liogier, Fl. Española 7:225–230. 1995; Borhidi et al., Rubiáceas Cuba 59–64. 2017; Borhidi et al., Acta Bot. Hung. 60(3–4):292–294. 2018. Type: *Catesbaea spinosa* L.

Catesbya Cothenius, *orth. var.*, Disp. 6. Jan–May 1790.

Phyllacanthus Hook. f., Hook. Icon. Pl. 11:77. 1871. [*Phyllacantha* Hook. f. in Bentham & J.C. Hooker, Gen. Pl. 2:78. 1873]. Type: *Phyllacanthus grisebachianus* Hook. f.

Echinodendrum A. Rich. in R. de la Sagra, Hist. Fis. Cuba 11:18. 1850. Type: *Echinodendrum campanulatum* (Sagra ex. DC.) A. Rich. [= *Catesbaea campanulata* Sagra ex DC., Prodr. 4:401. 1830]

1. Catesbaea ekmaniana Urb., Ark. Bot. 20A(5):54. 1926. Type: HAITI: Massif de la Selle, Monte Cabaio, Roberjot, 1700 m, 23 Aug 1924, *E.L. Ekman H-1587* (**lectotype, here designated:** S [No. S10-12160]; isolectotypes: F [No. 710735 (frag. ex US)], S [No. S-R-7815], US [00138219]).

***Distribution.*—**Haiti (Massif de la Selle).

***Notes.*—**Urban (1926:54–55), in the protologue of *Catesbaea ekmaniana* Urb., cited the material studied as "Massif de la Selle in faucibus Morne Cabaio prope Roberjot rarissima et parce 1,700 m alt., m. Aug flor.: [Ekman] n. H-1587," without citing the herbarium of deposit. The original material at B was destroyed during WWII. In S there is a specimen, with accession number S10-12160, that has a label with the annotation "Catesbaea Ekmaniana Urb." handwritten by Urban. The specimen consists of a ramified branch with numerous leaves and a small branch with a flower in anthesis, and is here designated as the lectotype of this name.

2. Catesbaea flaviflora Urb., Symb. Antill. 9:157. 1923. Type: CUBA: Santiago de Cuba, in declivibus calcareis, 25 Sep 1916, *E.L. Ekman 7731* (**lectotype, here designated:** S [No. S-R-7824]; isolectotype: K [K000173530]).

***Distribution.*—**Cuba (Santiago de Cuba, Holguín).

***Notes.*—**Urban (1923a:157), in the protologue of *Catesbaea flaviflora* Urb., cited the gathering *Ekman 7731*, without citing the herbarium of deposit. The original material at B was destroyed during WWII. Borhidi et al. (2017:60; 2018:293) cited the type of this name as "[…] *Ekman 7731*; Holotipo: B†; lectotipo: S!" According

to the *International Code of Nomenclature for algae, fungi, and plants* (Turland et al. 2018; hereafter the *Code*), starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017, 2018) lectotype citations are not valid.

In S there is a specimen of *Ekman 7731*, with accession number S-R-7824, which has a label with the annotation "Catesbaea flaviflora Urb." handwritten by Urban. This specimen consists of a ramified branch with numerous long thorns subtended by minute leaves, without flowers. This specimen is here designated as the lectotype of *Catesbaea flaviflora*.

In K there is a specimen of *Ekman 7731*, with barcode K000173530, which has a label with annotation "Catesbaea flaviflora Urb. […], det. I. Urban […]" handwritten by an unknown author. It consists of a branch with pairs of long thorns at each node, subtended by minute leaves, with numerous flowers in anthesis. This specimen is an isolectotype.

3. Catesbaea foliosa Millsp., Publ. Field Mus., Bot. 2:312. 1909. TYPE: BAHAMAS: Caicos Islands, West Caicos, 20 Dec 1907, *P. Wilson 7761* (HOLOTYPE: F [No. 221880]).

Distribution.—Bahamas, Cayman Islands.

4. Catesbaea fuertesii Urb., Symb. Antill. 7:402. 1912. TYPE: DOMINICAN REPUBLIC. BARAHONA: "in sylvis apertis," Nov. 1910, *M. Fuertes 641* (**NEOTYPE, here designated:** GH [00058995]; ISONEOTYPES: A [00105428], BM n.v., F [No. 768291], M [M-0187158], MO [No. 707104, barcode MO-03687], NY [00115054], US [No. 658445]).

Distribution.—Dominican Republic.

Notes.—Urban (1912:402–403), in the protologues of *Catesbaea fuertesii* Urb., cited the gathering *Fuertes 641*, without indicating the herbarium of deposit. The original material at B was destroyed during WWII. Four specimens of this gathering were found in A, GH, M, and NY, all of them without proof that they were studied by Urban. Hence a neotype needs to be designated. The GH specimen, with barcode 00058995, consists of a much-ramified branch, with numerous leaves subtended by acicular thorns, and numerous flowers in anthesis. This specimen is here designated as the neotype of this name.

5. Catesbaea gamboana Urb., Symb. Antill. 9:524. 1928. TYPE: CUBA. LAS TUNAS: Gamboa, in moist forest, 26 Aug 1922, *E.L. Ekman 14950* (**LECTOTYPE, here designated:** S [No. S-R-7823]; ISOLECTOTYPES: F [No. 604767], G [G00439777], NY [00115055]).

Distribution.—Cuba (Las Tunas, Granma).

Notes.—Urban (1928:524), in the protologue of *Catesbaea gamboana* Urb., cited the gathering *Ekman 14950*, without indicating the herbarium of deposit. The original material at B was destroyed during WWII. Borhidi et al. (2017:60; 2018:293) cited the type of this name as "*Ekman 14950*; Holotipo: B†; lectotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al. (2017:60; 2018:293) lectotype designations are not valid.

A specimen in S, with accession number S-R-7823, has a label with the annotation "Catesbaea gamboana Urb. (typus)" handwritten by Urban. The specimen consists of two ramified branches with numerous acicular thorns subtended by pairs of minute leaves. This specimen is here designated as the lectotype of this name.

6. Catesbaea glabra Urb., Symb. Antill. 7:401. 1912. TYPE: DOMINICAN REPUBLIC. SANTIAGO: Llanos de Rafael, 200 m, 12 May 1887, *H.F.A. Eggers 1912* (**NEOTYPE, here designated:** BM [000081474]; ISONEOTYPES: F [No. 776379 (frag.)], G [3 sheets, G00423003, G00423004, G00423005]).

Distribution.—Haiti, Dominical Republic.

Notes.—Urban (1912:401), in the protologue of *Catesbaea glabra* Urb., cited several syntypes from Haiti (*Picarda 80; Ehrenberg 97; Picarda 1341b; Picarda 335; Picarda 853*), and Dominican Republic (*Rob. Schomburgk 22; Rob. Schomburgk 118; Eggers 1912*). The original material at B was destroyed during WWII. A specimen in BM with barcode 000081474, has a label with the heading "Eggers: Flora Indiae Occid. Exs." and the annotations "[Nr.] 1912, Rubiaceae sp. [Santo Domingo] in fruticetis. Llanos de Rafael, 200 m, 12.V.1887" handwritten by an unknown author. The specimen consists of a densely ramose branch with three acicular thorns at each node, and is here designated as the neotype of *C. glabra*.

7. Catesbaea grayi Griseb., Pl. Wright. 2:503. 1862 [preprint of Mem. Amer. Acad. Arts, n.s. 8(2):503. 1863]. TYPE: CUBA. HOLGUÍN: Monte Verde, "frutex orgyalis, baccis albis, in sylvis at Monte Verde," s.d. [1860–1864], *C. Wright 371* (**LECTOTYPE, here designated:** GOET [GOET010202]; ISOLECTOTYPES: BR [000000557709], G [4 sheets, G00389798, G00389799, G00389800, G00389801], GH n.v., GOET [GOET010203], HAC [ex SV No. 951], HAC, K [2 sheets, K000173531, K000173532], MO [No. 2091978], P [P00559101], PH [0001648], S [No. S-R-7822, S10-12237], UC n.v., YU [YU.066110]).

Distribution.—Cuba (Las Tunas, Granma, Guantánamo, Holguín, Santa Clara).

Notes.—Grisebach (1862:503) in the protologue of *Catesbaea grayi* Griseb., cited the gathering *Wright 371*, without citing the herbarium of deposit. Borhidi et al. (2017:61; 2018:293) cited the type of *Catesbaea grayi* as "Tipo: […] *Wright 371*; Holotipo: GOET; isotipo: GH!" According to the *Code* (Turland et al. 2018), starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017:61; 2018:293) type citations cannot be treated as an inadvertent lectotype designation.

According to Stafleu and Cowan (1979:1007) most of Grisebach's types are in GOET. In GOET there are two specimens of *Wright* 371 annotated with this name. The specimen with barcode GOET010202, has a label with the annotation "C. Grayi m." handwritten by Grisebach. The specimen consists of two branches with numerous leaves, and one of them with a few flowers in anthesis, and is here designated as the lectotype of *Catesbaea grayi*.

The GOET specimen with barcode GOET010203, has a label with the annotation "C. Grayi Gr." handwritten by Grisebach. The specimen consists of two sterile branches, and is an isolectotype.

8. Catesbaea holacantha C. Wright ex Griseb., Cat. Pl. Cub. 122. 1866. TYPE: CUBA: "Cuba Occ., pr. Mayari abajo," s.d. [1860–1864], *C. Wright 2657* (HOLOTYPE: GOET [GOET010204]; ISOTYPES: BM [000081495 (specimen on right side of the sheet)], G [2 sheets, G00389796, G00389797], GH [00058989], HAC [ex LS], HAC, K [K000173533], MO [No. 2091979], NY [00115056], P [P00559100], S [No. S-R-7821], UC n.v., YU [YU.001726]).

Distribution.—Cuba (Las Tunas, Holguín, Granma, Guantánamo, Camagüey, Santi Spiritus, Villa Clara).

Notes.—Grisebach (1866:122) in the protologue of *Catesbaea holacantha* Wright ex Griseb., cited the gathering *Wright 2657*, without citing the herbarium of deposit. According to Stafleu and Cowan (1979:1007), the GOET herbarium contains most of his types. Borhidi et al. (2017:61; 2018:293) stated that the holotype of this name is at GOET. In GOET there is a single specimens of *Wright 2657*, barcode GOET010204, which has a label with the annotation "Catebaea holocantha" handwritten by Grisebach. The specimen consists of a much ramified branch, with dense sturdy thorns, subtended by minute leaves, and with numerous flowers in anthesis. This specimen is the holotype of this name.

In BM there is a sheet, with barcode 000081495, which has two different gatherings affixed on it. This barcode is assigned to the specimen on the left side of the sheet. On the right side of the sheet there is a specimen that has a label with the heading "Plantae Cubenses Wrightianae,,the number "2657" handwritten by an unknown author, and the printed annotation "Coll. C. Wright, 1860–1864." The specimen on the right side of the sheet, to which it should be assigned a different barcode, is an isotype of *Catesbaea holacantha*.

Borhidi et al. (2017:61; 2018:293) spelled the name of this species "*Catesbaea holoacantha* C. Wr. ex Griseb.," but the specific epithet was published as "*holacantha*" in the original publication, and it should be kept as such.

9. Catesbaea longispina A. Rich., in Sagra, Hist. Fis. Cuba, Bot. 11:12. 1850. TYPE: CUBA: ["Jagua, *De la Ossa s.n.*" but the specimen label says "legit *Ramon de la Sagra*, Cienfuegos, 873"] Cienfuegos, s.d., *R. de la Sagra 873* (HOLOTYPE: P [P00559104]; ISOTYPES: F [No. 972513 (frag. ex P), No. 630955 (frag. ex P)]).

Distribution.—Cuba (Cienfuegos, Ciego del Avila, Camaguey, Las Tunas, Holguín, Granma, Santiago de Cuba).

Notes.—Achille Richard (in Sagra 1850:12) in the protologue of *Catesbaea longispina* A. Rich., cited the material studied as "Crescit prope *Jagua*, ubi detexit clar. *De la Ossa*." The attribution of the gathering to De la Ossa is certainly an error because on the label of the specimen in P it is written that it was collected by Ramon de la Sagra. The holotype specimen of *C. longispina* has a label with the heading "Herbarium Richard" handwritten in red ink, the annotation "Catesbaea longispina Nob. Sp. nova" handwritten by Achille Richard, and the annotations "Cuba, legit Ramon de la Sagra" handwritten in red ink. Above that label is affixed another

label with the annotation "Cienfuegos. 873" handwritten by Ramon de la Sagra. The specimen consists of three branches with long, narrow thorns subtended by minute leaves, with several ovaries with the corollas fallen off. On the sheet is also affixed a single corolla in anthesis.

10. Catesbaea macrantha A. Rich., in R. de la Sagra, Hist. Fis. Cuba, Bot. 11:12, tab. 47. 1850. TYPE: CUBA. La Habana: Bacuranao, "Crescit in insula Cuba, prope Potrero de Barreto, Bacuranao," s.d., *R. de la Sagra s.n.* (HOLOTYPE: P [P00559106]).

Non Catesbaea macracantha C. Wright, Anales Acad. Ci. Méd. Fis. Nat. Habana 6:99. 1869 [= *Catesbaea spinosa* L.].

Distribution.—Cuba (La Habana, Cienfuegos, Sancti Spiritus, Las Tunas).

Notes.—Achille Richard (in Sagra 1850:12), in the protologue of *Catesbaea macrantha* A. Rich., cited the material studied as "*Protrero de Barreto* [sic!, i.e. Potrero], *Bacuranao* (*Ramon de la Sagra*)." In P there is one specimen, with barcode P00559106, which has a label with the heading "Herbarium Richard" and the bottom annotation "Scripsit A. Richard," both handwritten in red ink. The label also has the annotations "Catesbaea macrantha Nob. C. latifolia" handwritten by Achille Richard. The specimen consists of two branches with pairs of acicular spines at each nodes, numerous small leaves, and five large flowers in anthesis. This specimen is the holotype of *C. macrantha* A. Rich.

11. Catesbaea melanocarpa Krug. & Urb., in Urban, Symb. Antill. 1:427. 1899. TYPE: PUERTO RICO: Guanica, La Plata, 17 Jan 1886, *P. Sintenis 3786* (**LECTOTYPE, here designated:** BM [000081494]; ISONEOTYPES: US [No. 091360, barcode 00476949], US [No. 958600, without barcode]).

Distribution.—Puerto Rico, Lesser Antilles.

Notes.—Krug and Urban (in Urban, 1899:427–428) in the protologue of *Catesbaea melanocarpa* Krug. & Urb., cited several gatherings from Puerto Rico (*Sintenis 3362*, *Sintenis 3542*), St. Croix (*Eggers s.n.*), and Antigua (*Barber & Tillson 70*, *Wullschlägel 262*). The original material studied by Krug and Urban in B was destroyed during WWII. I was able to trace several specimens of the gatherings cited by Krug and Urban, although none of them are annotated by the authors. A specimen in BM, with barcode 000081494, has a label with heading "P. SINTENIS: PLANTAE PORTORICENSIS," the annotation "3786. Catesbaea parviflora Sw. Guanica, ad La Plata, 17.I.1886" handwritten by an unknown author, and the printed annotation "det. I. Urban." This specimen consists of three branches, all with long, acicular thorns. Two branches have a few leaves and several fruits. The third branch has leaves at all nodes and several fruits. This specimen is here designated as the lectotype of *C. melanocarpa*.

Another specimen of *Sintenis 3786* is in US, with barcode 00476949. It has the same label and the same annotations as the BM specimen. It consists of three branches, all of them with long, acicular thorns, a few leaves, and a few fruits. This specimen is an isolectotype.

Howard (1989:396–397) cited *Catesbaea melanocarpa* as present in Puerto Rico and St. Croix, and reported that various annotations on herbarium specimens suggested that it might be a synonym of *Catesbaea parviflora* Sw. However, I differ from his opinion, and I prefer to recognize it as a distinct species.

12. Catesbaea microcarpa Urb., Symb. Antill. 5:509. 1908. TYPE: HAITI: "Haiti in sylvis apricis ad Petite Rivière de Bajonnais, 100 m," Oct 1905, *W. Buch 1031* (**NEOTYPE, here designated:** GH [00058991]).

Distribution.—Haiti (Gonave Island).

Notes.—Urban (1908:509), in the protologue of *Catesbaea microcarpa* Urb., cited the gathering *Buch 1031*, without citing the herbarium of deposit. The original material at B was destroyed during WWII. A search in numerous herbaria retrieved a sole specimen of *Buch 1031* in GH, with barcode 00058991. There is no evidence on the sheet that it was studied by Urban. It consists of a small branch with pairs of small acicular thorns subtended by pairs of small leaves. No flowers or fruits are present. This specimen is here designated as the neotype of *C. microcarpa*.

13. Catesbaea nana Greenm., in R. Combs, Trans. Acad. Sci. St. Louis 7:428. 1897. TYPE: CUBA. Santa Clara: Distr. Cienfuegos, Cieneguita, on sandy arid savannah, 10 Aug 1895, *R. Combs 406* (HOLOTYPE: GH [00058992]; ISOTYPES: F [2 sheets, No. 358209, No. 17029], G [G00389797], K [K000173541], MO [No. 2091980], NY [00115058], P [P00559102], US [00138221 (frag. ex NY)]).

Distribution.—Cuba (Cienfuegos, Villa Clara, Ciego del Ávila, Camagüey).

Notes.—Greenman (in Combs 1897:428–429), in the protologue of *Catesbaea nana* Greenm., cited the material studied as "Collected by Robert Combs in dry poor soil at Cieneguita, Cuba, August 10, 1895, no. 406. A species related to *C. parviflora* Sw.–Plate XXXV," without citing the herbarium of deposit. According to Stafleu and Cowan (1979:364–365), Greenman's herbarium and types are at "GH, duplicates A, B, DS, E, F, L, MO, MONT, NY, US, W." In GH there is a specimen of *Combs 406*, barcode 00058992, with a label that has the annotations "Catesbaea nana, Greenman, n. sp." handwritten by Greenman. This specimen is the holotype of this name.

Borhidi et al. (2017:62; 2018:293) erroneously cited the type of *Catesbaea nana* as "Cuba, Distr. Cienfuegos, Cieneguita, *Combs 271* (B†, F)."

13. Catesbaea parviflora Sw., Prodr. 30. 1788. *Echinodendrum parviflorum* (Sw.) A. Rich., in R. de la Sagra, Hist. Fís. Cuba, Bot. 11:18. 1855. Type: JAMAICA: without locality, s.d., *Swartz s.n.* (**lectotype, here designated:** S [No. S-R-950]; isolectotypes: B-W [B–W 02800 -01 0], LD [No. 1250417], SBT [SBT13328]).

Distribution.—USA (Southern Florida), Bahamas, Cuba (La Habana, Mayabeque, Artemisa, Matanzas), Jamaica, Puerto Rico, Lesser Antilles.

Notes.—Swartz (1788:30), along with the succinct description of *Catesbaea parviflora* Sw., cited the collection locality as "Jamaica" without citing the herbarium of deposit. According to Stafleu and Cowan (1986: 117) "The Swartz herbarium constitutes, with the Alströlmer herbarium, the basis of […] S. […] The West-Indian collections (1784–1786) at S, however, are not complete." Swartz specimens are present in many herbaria, and, according to Stafleu and Cowan (1986:117), "Swartz was very liberal with his specimens and Swartz types will be found for instance in BM and LD."

Borhidi et al. (2017:62; 2018:293) cited the type of *Catesbaea parviflora* as "Tipo: Jamaica. leg.: Swartz s.n. Holotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype, or a neotype, must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017, 2018) type designations are not valid.

In S there is a specimen, with accession number S-R-950, which, on the verso of the sheet, has the annotations "Catesbaea parviflora Swartz. D. Swartz" and "E Jamaica: Swartz" handwritten by two different authors. The specimen consists of a small branch with pairs of acicular thorns and numerous pairs of small leaves. By the side of the branch are affixed the flowering branches of a *Spermacoce* species, and two medium-sized leaves that do not belonging to any *Catesbaea* species. The branch with acicular thorns is here designated as the lectotype of *Catesbaea parviflora*.

Catesbaea campanulata Sagra ex DC., Prodr. 4:401. 1830. *Echinodendrum campanulatum* (Sagra ex. DC.) A. Rich., in Sagra, Hist. Fís. Cuba, Bot. 11:18, tab. 47bis. 1850. Type: CUBA: Havana, s.d., *R. de la Sagra s.n.* (holotype: G-DC [G00666482]).

Notes.—Candolle (1830:401) cited the material studied of *Catesbaea campanulata* Sagra ex DC. as "in Cuba propè Havanam legit cl. Ramon de la Sagra. An à C. parviflorâ satis differt? (v.s.)." With this citation, he expressed doubts of whether this taxon might differ from *C. parviflora* Sw., and indicated that he saw a herbarium specimen, without citing the herbarium of deposit. In G-DC there is a single specimen, with barcode G00666482, annotated as "Catesbaea campanulata" by Candolle. On the specimen is pinned a label with the annotation "66. Catesbaea campanulata spec. nov. La Havanne Mr. Ramon de la Sagra, fevrier 1829" probably handwritten by Ramón de la Sagra. The specimens consists of a small branch with a few lateral branches, several pairs of though thorns, and congested minute leaves, and is the holotype of this name.

Catesbaea parviflora var. *septentrionalis* Krug & Urb., in Urban, Symb. Antill. 1:429. 1899. Type: USA. Florida: Southern Florida, Bahia Honda Key, s.d., *A.H. Curtiss 1130* (lectotype (Gillis 1974:162): GH [00058994]; isolectotype: A [00105426]).

Notes.—Krug and Urban (in Urban 1899:429), in the protologue of *Catesbaea parviflora* var. *septentrionalis* Krug & Urb., cited several gatherings from Florida, The Bahamas, and Cuba. The original material at B was destroyed during WWII. Gillis (1974:162) cited the type of *C. parviflora* var. *septentrionalis* as "Lectotype: Florida, Bahia Honda Key, *Curtiss 1130* (GH); isotype; GH." There are two specimen of *Curtiss 1130*, one in GH and the other in A. These two herbarium codes belong to specimens present in the Harvard University Herbarium, and Gillis cited both of them as present in GH.

In GH there is a single specimen of *Curtiss 1130*, on which is affixed a label with the typewritten annotation "Lectotype: Catesbaea parviflora var. septentrionalis Krug & Urb., Symb. Antill. 1: 429. 1899. William T. Gillis August 1974." This specimen, with barcode 00058994, has a label with printed heading "Curtiss, North American Plants" and the printed annotations "Shrub 4–6 feet high; fruit white. Bahia Honda Key, South Florida." It consists of two branches densely covered with small leaves, with pairs of acicular thorns at every node, and numerous immature fruits. This is the specimen that Gillis designated as the lectotype of *Catesbaea parviflora* var. *septentrionalis*.

The specimen of *Curtiss 1130* in A, with barcode 00105426, has the same labels of the GH specimen. It is the specimen that Gillis (1974:162) cited as "isotype; GH." The specimen consists of a ramified branch densely covered with small leaves, with acicular thorns at every node, and several immature fruits, and is an isolectotype.

Catesbaea fasciculata Northr., Mem. Torrey Bot. Club 12:66, tab. 16. 1902. TYPE: BAHAMAS: ANDROS: Fresh Creek, 6 Jun 1890, *J.I. Northrop & A.R. Northrop 627* (LECTOTYPE (Gillis 1974:162): F [No. 130711]; ISOLECTOTYPES: A [00058993], G [G00389802], GH [00105427], K [K000173529], NY [00007353]).

Notes.—Alice Northrop (1902:66–67, tab. 16) in the protologue of *Catesbaea fasciculata* Northr., cited the material studied as "Collected in Fresh Creek, Andros, June 6. The same as *Eggers 4508* from Hog Island (627)." The number "627" corresponds to the gathering *Northrop & Northrop 627*. Hence, she cited two gatherings, *Northrop & Northrop 627*, from Andros Insland, and *Eggers 4508*, from Hog Island, without citing the herbarium of deposit. According to Stafleu and Cowan (1981:775), Northrop's herbarium and types are at "F, other material in A, B, G, GH, K, NY, US." Northrop (1902:10) in the chapter entitled "Analysis of the Collections" stated "The type specimens are in the herbarium of Columbia University [now integrated in NY]. Sets are also at Kew, The Royal Botanical Garden at Berlin, the Gray herbarium, and Geneva." Article 9.1 Note 1 of the *Code* (Turland et al. 2018), states, "If the author used only one specimen or illustration, either cited or uncited, when preparing the account of the new taxon, it must be accepted as the holotype, but the possibility that the author used additional, uncited specimens or illustrations (which may have been lost or destroyed) must always be considered." John and Alice Northrop produced various duplicates of their gatherings, which are now at B, F, G, GH, K and NY. Alice Northrop did not prepare the protologue from a single specimen now at NY. The duplicates of *Northrop & Northrop 627* and *Eggers 4508* are syntypes, one of which should be designated as lectotype. Hence, I disagree with Kass (2005) that the specimen *Northrop & Northrop 627* in NY, barcode 00007353, is the holotype of *C. fasciculata*.

Gillis (1974:162) treated *Catesbaea fasciculata* as a synonym of *C. parviflora* Sw. and cited its type as, "Type: Fresh Creek, Andros, *Northrop and Northrop 627* (Lectotype: F-130711; Isotypes: A, GH, NY)." Therefore, Gillis designated the F specimen with accession number 130711 as the lectotype of *C. fasciculata*, which is here followed.

14. Catesbaea parvifolia DC., Prodr. 4:401. TYPE: HISPANIOLA: without locality, s.d. [1819–1820], *C. Bertero s.n.* (HOLOTYPE: G-DC [G00666416]).

Distribution.—USA (Southern Florida), Jamaica, Puerto Rico, Haiti, Dominican Republic, Antigua.

Notes.—Candolle (1830:401) in the protologue of *Catesbaea parvifolia* DC., cited the material studied and previously published names as "in Santo-Domingo legit cl. Bertero. Catesbaea parviflora var. Domingensis Spreng.! syst. 1. p. 416. Gardenia parvifolia Lam. dict. 3. p. 441. ex Roem. et Schult. syst. 5. p. 247.—Randia parvifolia Lam. dict. 3. p. 25 (excl. Sloan. syn.) ill. t. 156. f. 2. huc refer. videtur, etiamsi flos 5-fidus depictus sit. (v.s.)." Just below, Candolle (1830:401) wrote: "*Species exclusae*—[…] C. [Catesbaea] parviflora Lam. = Scolosanthus versicolor." In G-DC, there is a single original specimen, with barcode G00666416, with two labels. One label has the annotation "Randia parvifolia Lam. Catesbaea _____ [meaning *Catesbaea parvifolia*] DC. handwritten by Candolle. The other label has the annotations "Catesbaea parvifolia W. ex Spreng. H. Balbis" handwritten by Candolle, and "S. Doming. Bertero, M. Balbis 1821" handwritten by another author. The specimen consists of a branch with numerous lateral branches, minute leaves, and pairs of acicular thorns at each node. This specimen is the holotype of this name.

15. Catesbaea phyllacantha Griseb., Cat. Pl. Cub. 122. 1866. *Phyllacanthus grisebachianus* Hook. f., Hook. Icon. Pl. 11:77, tab. 1095. 1871. TYPE: CUBA: [Pinar del Río] "Cultivated at Retiro but indigenous on north coast," 1863, *C. Wright 2655* (HOLOTYPE: GOET [GOET010428]; ISOTYPES: GH [00058984], K [K000173528], MO [MO-038765], NY [00115059], S [No. S-R-7820], YU [YU.001746]).

Distribution.—Cuba (Pinar del Río, Toscano, in forests bordering the mangroves towards Inojal). Probably extinct.

16. Catesbaea sphaerocarpa Urb., Symb. Antill. 7:401. 1912. TYPE: HAITI: "Prope André," Apr 1899, *W. Buch 196* (**NEOTYPE, here designated:** GH [00058987]).

Distribution.—Haiti.

Notes.—Urban (1912:401–402) in the protologue of *Catesbaea sphaerocarpa* Urb., cited the material studied as "Hab. in Haiti prope Gonaïves in Plaine, m. Dec. fruct.: Picarda n. 1558, ? prope André m. April. flor. […]: Buch n. 196 […]." The original material at B was destroyed during WWII. As a result of a search in numerous herbaria, a single specimen of *Buch 196* was found in GH, with barcode 00058987. There is no evidence on the sheet that it was studied by Urban. On the sheet are affixed five ramified branches with pairs of acicular thorns, some of them subtended by pairs of minute leaves, and a few flower buds. This specimen is here designated as the neotype of *C. sphaerocarpa*.

17. Catesbaea spinosa L , Sp. Pl. 109. 1 May 1753. TYPE: [icon.]: "*Frutex Spinosus Buxi foliis, plurimis simul nascentibus; flore tetrapetaloide, pendulo, sordide flavo, tubo longissimo; fructu ovali croceo, semina parva continente*" in Catesby, Nat. Hist. Carolina p. 100, tab. 100. 1743. (lectotype (Dandy *Sloane Herbarium*: 112. 1958). Voucher: Herb. Sloane 232:21 (BM-SL; collected by Catesby near Nassau, New Providence, The Bahamas).

Distribution.—Cultivated in southern Florida, Bahamas, Cuba (the whole island).

Notes.—Linnaeus (1753:109–110), in the protologue of *Catesbaea spinosa* L., cited "*Catesb. carol.* 2. *p.* 100. *t.* 100. *Habitat in Providencia*." With the expression "*Catesb. carol.*," he meant Catesby's publication *Natural History of Carolina*, and specifically referred to volume 2, page 100, table 100. Dandy (1958:112) in his publication *Sloane Herbarium*, cited the same reference provided by Linnaeus, which is associated with the specimen in the Sloane Herbarium No. 232: 21 at BM-SL.

Catesbaea latifolia Lindl., Bot. Reg. 10:Tab. 858. 1825 ["1824"]. TYPE: [icon.]: Tab. 858 of Lindl., Bot. Reg. 10:1825 ["1824"] (**LECTOTYPE**, **here designated**).

Notes.—Lindley (1825:Tab. 858) cited the material studied of *Catesbaea latifolia* Lindl., as "Received from the West Indies by Mr. Colville, in whose Nursery our drawing was made this summer." In Lindley's plate 858 in the *Botanical Register* is depicted a branch with pairs of long acicular thorns, subtended by pairs of medium-sized leaves. On the branch are inserted two flowers in anthesis with large corollas, exserted stamens and style. All the elements depicted in this plate are sufficient for the application of the name. Hence, in absence of original specimens associated with this name, Table 858 is here designated as the lectotype of this name.

Catesbaea longiflora Sw., Prodr. 30. 1788, *nom. superfl.*

Notes.—Swartz (1788:30) below *Catesbaea longiflora* Sw. cited *C. spinosa* L. (as "*ipinosa*"). Hence *C. longiflora* is a superfluous name.

Catesbaea macracantha C. Wright, Anales Acad. Ci. Méd. Habana 6:99. 1869. TYPE: CUBA. Sancti Spíritus: "En el Potrero Manatí jurisdiccion de Trinidad cerca de los manglares," s.d., *C. Wright 3575* (**LECTOTYPE, here designated:** GH [00058990]; ISOLECTOTYPES: NY [00115057], US [0138220]).

Notes.—Wright (1869:99) in the protologue of *Catesbaea macracantha* C. Wright, cited the collection locality and his own collection number, without citing the herbarium of deposit.

Borhidi et al. (2017:61–62; 2018:293) cited the type of *C. macracantha* as "Cuba. Oriente, Potrero Manatí, Wright 3575. Holotype: GH; isotype, HAC!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al. (2017:61–62; 2018:293) lectotype designations (as "holotype") are not valid.

As a result of a general search in numerous herbaria, three specimens of *Wright 3575* were retrieved. The specimen in US, barcode 0138220, has a label with the annotation "Catesbaea macracantha Wr." handwritten by Wright. The specimen consists of two branches. The branch on the left side of the sheet is densely ramified, densely spinose, with several minute leaves, without fruits or flowers. The branch on the right side is sparsely spinose, with longer spines, subtended by minute leaves, and has a ripe fruit.

The NY specimen of *Wright 3575*, with barcode 00115057, has a label with the annotation "Catesbaea macracantha Wr." handwritten by Wright. The specimen consists of four branches. All of them with sparse long spines, often subtended by minute leaves, and a ripe fruit.

The GH specimen of *Wright 3575*, with barcode 00058990, has a label with the annotation "Catesbaea macracantha Wr." handwritten by an unknown author. On the left side of the sheet is affixed a label with the annotation "Catesbaea, Mar 15, Fruticosis 10-15 f. Fr. pallido. Low lands near Mangrove swamps, Potrero Manati. Trinidad." handwritten by Wright. The specimen consists of two branches, one unbranched, with sparse, long spines and numerous minute leaves. The other branch is densely ramified, with sparse, long spines, and has one ripe fruit. The material on this sheet is here designated as the lectotype of *Catesbaea macracantha*.

Borhidi et al. (2017:61–62; 2018:293), treated *Catesbaea macracantha* C. Wr. as a distinct species. This name is a synonym of *C. spinosa*.

CATESBAEA EXCLUDED TAXA

Catesbaea elliptica Spreng. ex DC., Prodr. 4:401. 1830. TYPE: Pro syn. *Catesbaea vavassorii*.

= *Exostema spinosum* (Le Vavass) Krug & Urb. (See below).

Catesbaea erecta Sesse & Mociño ex DC., Prodr. 4:401. 1830. TYPE: Based on unpublished illustration for Fl. Mex.

= *Bouvardia erecta* (Sesse & Mociño ex DC.) Standl., in N.L. Britton et al. (eds.), N. Amer. Fl. 32:110. 1921.

Catesbaea inermis Spreng., Syst. Veg., ed. 16, 1:416. 1825 ["1824"]. TYPE: Not traced.

= *Rondeletia inermis* (Spreng.) Krug & Urb., in Urban, Symb. Antill. 1:416. 1899.

Notes.—Sprengel (1825:416), in the protologue of *Catesbaea inermis* Spreng., cited the locality and collector as "*Portorico.* Bertero" without citing the herbarium of deposit. He described *C. inermis* as "C. foliis oblongis obtusis mucronatis venoso-lineatis, floribus

axillaribus solitariis." The original material studied by Sprengel at B was destroyed during WWII. As a result of a general search in TO, G, G-DC, M, W, and the Jstor Global Plants and Jacq virtual herbaria, no original material was found. Hence, a neotype for this name needs to be designated. Krug and Urban (1899:416–417) transferred *C. inermis* to *Rondeletia*, as *R. inermis* (Spreng.) Krug. & Urb., under which they recognized four varieties.

Catesbaea parahybensis Vell., Fl. Flum. 54. 1829 [1825"]. [Fl. Flum. Icon. 1:Tab 145. 1831 ["1827"]] [Protologue] "*Florentem vidi Sept. ad ripas fluvii vulgó dieti Parahyba prope locum 15 Ilhas denominatum*."
= *Faramea* sp.

Notes.—Vellozo (1829:54) in the protologue of *Catesbaea parahybensis* Vell., described the collection locality near the Rio Parahiba, southern Brazil. Vellozo's herbarium has been lost, and the plates published in *Flora Fluminensis Icones* were published two years after the description (Vellozo, 1831), hence they are not original material. The original drawings incommended by Conceicao Vellozo and included in the *Florae Fluminensis Icones* are preserved in two institutions: 1) the Manuscript Section of the National Library in Rio de Janeiro (https://bndigital.bn.gov.br/acervodigital), which is a complete set of the original plates, bound in 11 volumes, with each plate identified by a unique catalogue number; and 2) the Archives of the Torre do Tombo, Lisbon (https://digitarq.arquivos.pt/results?t=florae+fluminensis), which is an incomplete set, with only volumes 6, 7, 8, 9, and 11, and with the drawings slighty different from those in the

Manuscript Section of the Brazilian National Library. The typification of *C. parahybensis* Vell. is not attempted in this treatment.

Catesbaea triacantha Spreng., Neue Entdeck. Pflanzenk. 3:47. 1822. *Chomelia triacantha* (Spreng.) Griseb., Cat. Pl. Cub.:133. 1866. *Guettarda triacantha* (Spreng.) F. Maza, Anales Soc. Esp. Hist. Nat. 23:290. 1894.
= *Scolosanthus triacanthus* (Spreng.) DC. (See below).

Cinchona spinosa Vavass , Observ. Phys. 37(2):243, tab. 2. 1790. *Catesbaea vavassorii* Spreng., Syst. Veg. 1:416. 1825, nom. nov.
= *Exostema spinosum* (Le Vavass.) Kr. & Urb. (See below under *Exostema spinosum*).
https://gallica.bnf.fr/ark:/12148/bpt6k9603516s/f257.item (Just after page 320)

CERATOPYXIS

Joseph Dalton Hooker (1872:24, tab. 1125) described the genus *Ceratopyxis* Hook.f., with a sole species, *C. verbenacea* (Griseb.) Hook.f., which is based on *Rondeletia verbenacea* Griseb. He did not explain the etymology of the genus name. From the Greek, cerato- (κέρατο, horn) and pixys (πήεης, capsule), could mean either horny capsule or capsule with horns. *Ceratopyxis* has traditionally been included in the Chiococceae (Bremer 1992; Delprete 1996; Robbrecht 1988, 1994). It is distinguished from other genera within the tribe by the composition of the following characters: erect shrub, resinous at nodes, stipules large, ovate, intrapetiolar, persistent, inflorescence terminal, frondose, thyrsiform, cylindrical, densiflorous, ovaries 2-locular, with one pendulous ovule per locule, fruits capsular, subcoriaceous, laterally compressed, septicidal, seeds pendulous, oblong-subreniform, and laterally compressed. Its position in the Chiococceae was confirmed by the molecular phylogenies of Rova et al. (2002) and Paudyal et al. (2018). *Ceratopyxis* is a monotypic genus endemic to the Cuban province of Pinar del Río.

Ceratopyxis Hook.f , Hook. Icon. Pl. 12:24, tab. 1125. 1872; Liogier, Fl. Cuba 5:89. 1962; Vales & Babos, Acta Bot. Acad. Sci. Hung. 23(1–2):275–283. 1977; Borhidi et al., Rubiáceas Cuba 64–65, f. 12. 2017. TYPE: *Ceratopyxis verbenacea* (Griseb.) Hook. f.

1. Ceratopyxis verbenacea (Griseb.) Hook. f., Hook. Icon. Pl. 12(1):24, tab. 1125. 1872. *Rondeletia verbenacea* Griseb., Cat. Pl. Cub. 130. 1866. TYPE: CUBA: "Cuba occ.," Pinar del Río, s.d., *C. Wright 2695* (HOLOTYPE: GOET [GOET010206]; ISOTYPES: G [2 sheets, G00389794, G00389738], GH [00095875 (without collection number)], K [1 sheet, K000432658, K000432659], MO [No. 2091124], NY [02200784], S [No. S05-990], YU [YU.001727]).

Distribution.—Cuba (Pinar del Río: Sierra de los Órganos).

Notes.—Grisebach (1866:130) in the protologue of *Rondeletia verbenacea* Griseb., wrote "Habitu accedit Lercheam et probabiliter novum genus formabit.—Cuba occ. (Wr. [Wright] 2695). E." In GOET, where Grisebach worked, there is a sole specimen, with barcode GOET010206, which has two labels with the annotation "Rondeletia ? verbenacea m." followed by a detailed description handwritten by Grisebach. The specimen consists of a small branch with several leaves and two inflorescences with numerous dehisced capsules. This specimen is the holotype of this name.

CHIOCOCCA

Patrick Browne (1756:164) described the genus *Chiococca*, without mentioning a species, and cited the vernacular name as "The climbing Snow-berry." Accordingly, he derived the genus name from the Greek, chion- (κιών, snow) and -kokkos (κόκκος, berry), referring to the white fruits. Paudyal et al.'s (2018) included 17 species of *Chiococca* in their molecular phylogenetic study. In the phylogenies obtained, 14 species were resolved on one clade, while two species, *C. naiguatensis* Steyerm. (Venezuela) and *C. plowmanii* (coastal dunes of Brazil), were found on a strongly supported separate clade, along with two entries of *Salzmannia nitida* (coastal dunes of Brazil). In Paudyal et al.'s (2018) phylogenies, another species of *Chiococca*, *C. cubensis* Urb., was found on yet another strongly supported clade, as sister taxon to the *Scolosanthus* clade. Hence, they transferred *C. cubensis* to the monospecific genus *Ramonadoxa* (See below). *Chiococca* is the type genus of the tribe Chiococceae, and has variable habit, ranging from small shrub to vine to lianas, small, deeply lobed flowers, usually white or yellow corollas (rarely red outside), and 2-seeded (rarely 1- or 3-seeded) spongy drupes. *Chiococca* (including *Asemnantha*) is here recognized as genus of 22 species occurring throughout the Neotropics, and in subtropical regions, with the center of diversity in Mexico and Central America, with 2–3 species in the Greater Antilles, and a few species in South America.

Chiococca P. Browne, Civ. Nat. Hist. Jamaica 164. 1756; Standley, N. Amer. Fl. 32(4):285–290. 1934; Liogier, Fl. Cuba 5:93–94. 1962; Steyermark, Mem. New York Bot. Gard. 23:373–384, f. 63. 1972; Steyermark, in Lasser & Steyermark, Fl. Venezuela 2:870–888, f. 140–142. 1974; Correll & Correll, Fl. Bahama Arch. 1383–1386, f. 603–604. 1982; Liogier, Fl. Española 7:231–233. 1995; Lorence, Fl. Mesoamericana 4.2:47–51. 2012; Borhidi et al., Rubiáceas Cuba 68–73, f. 14–15. 2017. TYPE: *Chiococca alba* (L.) Hitchc.

Asemnantha Hook.f., in Bentham & Hooker, Gen. Pl. 2(1):106. 7–9 April 1873] [Hook.f., in Hooker's Icon. Pl. 12:40, pl. 1145. April 1873 (as "*Asemnanthe*")] TYPE: *Asemnantha pubescens* Hook.f., in Bentham & Hooker, Gen. Pl. 2(1):107. 7–9 April 1873 [Hook.f. in Hooker's Icon. Pl. 12:40, pl. 1145. April 1873 (as "*Asemnanthe pubescens*")] [= *Chiococca motleyana* Borhidi, Acta Bot. Hung. 53:268. 2011].

Notes.—The genus *Asemnantha* Hook.f. was published by Joseph Dalton Hooker in 1873, in both Bentham and Hooker's *Genera Plantarum* (as "*Asemnantha*") and *Hooker's Icones Plantarum* (as "*Asemnanthe*"). Stafleu and Cowan (1970:294–296), for the entry of *Hooker's Icones plantarum*, on page 294, supplied the date of publication for volume 12 as 1876, which is the date reported on the title page of the volume. However, on page 296, they gave different dates for the four parts of volume 12. Stafleu and Cowan (1970:296) reported that page 40 and plate 1145 of *Asemnantha pubescens* Hook.f. (as "*Asemnanthe pubescens*") are included in the second part of volume 12, which was published in April 1873 (Hooker, 1873b). This was determined from notes in the copies in BM and K. Article 31.1 of the *Code* (Turland et al. 2018) makes the exception that proof establishing the date of publication supersedes the date on the title page. Because both publications were published on April 1873, it is impossible to establish which of them has priority. As the publication of *Genera Plantarum* vol. 2, part 1, has the date of 7–9 April 1873 (Hooker, 1873a), it is here treated as the first publication of those names, and name *Asemnantha* is retained for this genus.

1. Chiococca alba (L.) Hitchc., Report Missouri Bot. Gard. 4:94. 1893. *Lonicera alba* L., Sp. Pl. 175. 1753. TYPE: [protologue] "Jamaica, St. Catherine Parish, savanna, towards Two-mile-Wood," [icon.] "Jasminum forte," Sloane, Voy. Jamaica 2, tab. 188, fig. 3. 1725 (LECTOTYPE (Franck et al. 2021:45); EPITYPE (Franck et al. 2021:45): "Jamaica," *H. Sloane s.n.* (BM [000594058].

Distribution.—From Southern USA (Texas & Florida), Mexico to Argentina.

Notes.—This is the most widespread species in the genus, ranging throughout the Neotropics, and extending in subtropical regions of southern USA and northern Argentina. As here delimited, it is a very variable species, in terms of vegetative and reproductive characters. It has a variable habit ranging from shrub, vine, or liana, climbing on trees up to 15 m from the ground. A detailed study of specimens from throughout the range of this species might reveal that some of the names here listed in synonymy might deserve to be recognized as distinct species or infraspecific taxa.

Chiococca racemosa L., Syst., Nat., ed. 10, 2:917. 1759, *nom. superfl.* (*Lonicera alba* L. (1753) is cited in synonymy).

Chiococca brachiata Ruiz & Pav., Fl. Peruv. 2:67, pl. 219b. 1799. TYPE: PERU: Chinchao, ["in nemoriibus Chinchao Quebrada ad Macora praedium"], s.d., *H. Ruiz López & J.A. Pavón Jiménez s.n.* (LECTOTYPE (Franck et al. 2021:45): MA [MA815658]; ISOLECTOTYPE: MA [MA815659]).

Chiococca pubescens Humb. & Bonpl. ex Schult., in Roemer & Schultes, Syst. Veg., ed. 15[bis], 5:202. 1819. *Chiococca anguifuga* Mart. var. β *pubescens* (Humb. & Bonpl. ex Schult.) DC., Prodr. 4:483 (1830). TYPE: VENEZUELA: Cumaná, ["Habitat in America meridionali"], s.d., *A.J.A. Bonpland & F.W. Humboldt s.n.* (**LECTOTYPE, here designated:** B-W [B –W 04141 -01 0]).

***Notes.*—**Josef August Schultes (in Roemer & Schultes, 1819:202) attributed the name *Chiococca pubescens* to Humboldt and Bonpland, and in the protologue he also cited "Reliqu. Willd. MS." meaning that the specimen was previously studied by Willdenow. In B-W there is a folder [Willdenow folder B –W 04140] with the label "Pentandria Monogynia, Chiococca parviflora […] Habitat in Cumana" handwritten by Willdenow. Inside the folder, there are two sheets, both of them with the annotation "Ch. parviflora" handwritten on the upper right corner. Specimen with barcode B –W 04141 -01 0, kept inside that folder, is here designated as the lectotype of *Chiococca pubescens* Humb. & Bonpl. ex Schult.

Chiococca parviflora Humb. & Bonpl. ex Schult., in Roemer & Schultes, Syst. Veg., ed. 15 [bis] 5:202. 1819. Type: VENEZUELA: Cumaná, s.d., *A.J.A. Bonpland & F.W. Humboldt s.n.* (lectotype (Franck et al. 2021:45): B-W [B –W 04140 01 0]; possible isolectotypes: B-W [B –W 04140 02 0], HAL [0113824]).

***Notes.*—**Schultes (in Roemer & Schultes, 1819:202) attributed the name *Chiococca parviflora* to Humboldt and Bonpland, and in the protologue he also cited "Reliqu. Willd. MS." meaning that the specimen was previously studied by Willdenow. In B-W there is a folder [Willdenow folder B –W 04140] with the label "Pentandria Monogynia, Chiococca parviflora […] Habitat in Cumana" handwritten by Willdenow. Inside the folder, there are two sheets, both of them with the annotation "Ch. parviflora" handwritten on the upper right corner. Specimen with barcode B –W 04140 01 0, kept inside that folder, was designated as the lectotype of *C. parviflora* Humb. & Bonpl. ex Schult. by Franck et al. (2021:45).

Chiococca paniculata Hoffm. ex Schult., in Roemer & Schultes, Syst. Veg., ed. 15[bis]. 5:203. 1819, not validly published.

Chiococca anguifuga Mart., Denkschr. Königl. Akad. Wiss. München 1824:93, tab. 9, figs. 20–21. 1824. Type: BRAZIL. Minas Gerais: "Crescit in sylvis primaevis ad Praesidium S. Ioannis Baptistiae et alibi in parte orientali Provinciae Minas Gerais," s.d., *C.F.P. Martius s.n.* [Martius Obs. 1088] (**lectotype, here designated:** M [M-0187149]).

***Notes.*—**Martius (1824:93) in the protologue of *Chiococca anguifuga* Mart., cited the collection locality of a gathering collected by himself, without citing his collection number or the herbarium of deposit. Müller Argoviensis (1881:51) synonymized *C. anguifuga* Mart. under *C. brachiata* var. β *genuina* Müll. Arg. [= *C. alba*]. In M there is a specimen, barcode M-0187149, which has a label with the heading "Dr. Martius Iter Brasil." and the handwritten annotations "Chiococca anguifuga Mart., Raiz preta Bras. Habitat in sylvis aboriginibus ad Presid. S. Joannis Babtistae, Provinciae Minarum, Observ. 1088." The specimen consists of a branch with several leaves and several inflorescences with filiform rachis and sparse, secundiflorous secondary branches. On the inflorescences are present several fruits. This specimen, collected and described by Martius, is here designated as the lectotype of *C. anguifuga*.

Chiococca densifolia Mart., Denkschr. Königl. Akad. Wiss. München 1824:93, tab. 6. 1824. *Chiococca brachiata* var. κ *densifolia* (Mart.) Müll. Arg., in Martius et al., Fl. Bras. 6(5):53. 1881. Type: BRAZIL. Bahia: "Habitat in sylvis primaevis ad Almada et Ferradas nec non alibi in saltu illo vacatissimo, montium maritimorum tractum in Provincia Bahiensi laeta et aeterna fronde tegente," s.d., *C.F.P. Martius Herb. Bras. 603* (**lectotype, here designated:** M [M-0187142]; isolectotypes: GH [00257765], HAL [HAL0113133], W [Reicherbach fil. No.W1889-0287615]).

***Notes.*—**Martius (1824:93), in the protologue of *Chiococca densifolia* Mart., cited the collection locality of a gathering collected by himself, without mentioning the collection number or the herbarium of deposit. Müller Argoviensis (1881:51) published the new combination *C. brachiata* var. κ *densifolia* (Mart.) Müll. Arg. [= *C. alba*], under which he cited, among other gatherings, "*Martius Hb. Flor. Bras. n. 602, 603*." In M there is a specimen, barcode M-0187142, which has a label with the handwritten annotation "Chiococca densiflora [! sic] Mart. var. (Ch. anguifuga in herb. Mart.)," the printed annotation "Martii Herbar. Florae Brasil. No.," and the handwritten number "603." This specimen consists of two branches with numerous leaves and several axillary inflorescences. Because this specimen was collected and described by Martius, it is here designated as the lectotype of *C. densifolia*.

Chiococca racemosa Jacq. var. β *scandens* DC., Prodr. 4:482. 1830. Type: PORTO RICO: without locality, 1827, *H. Wydler 368* (**lectotype, here designated:** G-DC [G00666532]).

***Notes.*—**Candolle (1830:482), in the protologue of *Chiococca racemosa* var. β *scandens* DC., cited "In Jamaicâ, ins. Stae.-Crucis. Brown. jam. 164. n.2. Swartz obs. var. β (v.s.)." In G-DC there is a single specimen associated with this name, which is annotated as "Chiococca racemosa β scandens Sw. Pers." by Candolle. This specimen, with barcode G00666532, has a label with the annotation "H. Wydler. Portorico. 1827. N° 368, Chiococca racemosa." This specimen is here designated as the lectotype of *C. racemosa* var. *scandens*.

Chiococca racemosa Jacq. var. γ *laxiflora* DC., Prodr. 4:482. 1830. Type: cultivated: ["v.s. cult. in hort. Calc."], 1819, *N. Wallich s.n.* (lectotype (Franck et al. 2021:45): G-DC [G00666534]).

Chiococca racemosa Jacq. var. δ *longifolia* DC., Prodr. 4:482. 1830. Type: GUADALOUPE: ["In Guadalupâ legit cl. Badier. (v.s.)."], without locality, s.d. [1780–1790], *Badier s.n.* (lectotype, (Franck et al. 2021:45): G-DC [G00666535]; possible isolectotype: P-LA [P00308513]).

***Notes.*—**Candolle (1830:482), in the protologue of *Chiococca racemosa* var. γ *laxiflora* DC., cited the material studied as "In Guadalupâ legit cl. Badier. (v.s.)." In G-DC there is a sheets with two specimens affixed on it. On the bottom right corner is pinned a label with the annotation "Chiococca racemosa γ laxiflora DC." handwritten by Candolle. The specimen on the right side of the sheet, with barcode G00666535, was designated as the lectotype of *C. racemosa* var. *longifolia* by Franck et al. (2021:45).

In P-LA, there is a specimen with barcode P00308513, which has the two labels affixed on the bottom right corner. The bottom label has the annotation "Chiococca racemosa L." handwritten by an unknown author, and the label just above has the annotation "de la Guadeloupe coll. Badier. This specimen is a possible isolectotype of *C. racemosa* var. *longifolia*.

Chiococca racemosa Jacq. var. ε *floridana* DC., Prodr. 4:482. 1830. *Chiococca floridana* (DC.) Raf., Alsogr. Amer. 75. 1838. TYPE: USA. FLORIDA: locality unknown, s.d., *F.-A. Michaux s.n.* (**LECTOTYPE, here designated:** G-DC [G00666526]; PROBABLE ISOLECTOTYPES: P [P00320364, P03920880]).

Notes.—Candolle (1830:482), in the protologue of *Chiococca racemosa* var. ε *floridana* DC., cited the localities as "in Floridae et Mexici maritimis. Chiococca racemosa Mich! fl. bor.-am. 1. p. 103. (v.s.)." Franck et al. (2021:45) designated as the lectotype of *Chiococca racemosa* var. *floridana*, a specimen in P with barcode P00320364. This specimen has a label with the annotation "Chiococca. Ici se termine les plantes des climats froids et des climats chauds de l'Amerique. 15-1" handwritten by Michaux. There is no evidence on the sheet that this specimen was studied by Candolle. Hence Franck et al.'s (2021:45) lectotypification is here superseded.

In G-DC there is a single sheet annotated with this name by Candolle, on which are pinned two specimens. Specimen with barcode G00666525, pinned on the lower portion of the sheet, has a label with the annotation "BERLANDIER. Tampico de Tamaulipas. (1827). N.° 125." Specimen with barcode G00666526, pinned on the upper portion of the sheet, has a label with the handwritten annotation "Chiococca. Florida. Michaux fil." and is here designated as the lectotype of *C. racemosa* var. *floridana*.

Chiococca racemosa Schltdl. & Cham., Linnaea 5:166. 1830, *nom. superfl.* (The name *Chiococca racemosa* L. is cited in synonymy).

Chiococca densifolia Mart. var. *cubensis* DC., Prodr. 4:482. 1830. *Chiococca racemosa* var. *cubensis* (DC.) Müll.Arg. in Martius et al., Fl. Bras. 6(5):54. 1881. TYPE: CUBA: ["In Ins. Cubâ legit cl. Ramon de la Sagra. (v.s.)."], s.d., *R. de la Sagra s.n.* (LECTOTYPE (Franck et al. 2021:45): G [G00389833]; POSSIBLE ISOLECTOTYPE: G [G00389834]).

Notes.—Candolle (1830:482), in the protologue of *Chiococca densifolia* var. *cubensis* DC., cited the material studied as "In Ins. Cubâ legit cl. Ramon de la Sagra. (v.s.)." In G (ex Herb. Moricand), there are two specimens associated with this name. Specimen with barcode G00389833, has a label with the annotations "Pent. monog. Chiococca densifolia β cubensis DC! Prodr. 4. p. 482. N° 2. Havane. Mr. Ramond de la Sagra." On this sheet is affixed a branch with numerous leaves and several inflorescences with numerous flowers in anthesis. This specimen was designated as the lectotype of *C. densifolia* var. *cubensis* by Franck et al. (2021:45).

The other G specimen, with barcode G00389834, has a label with the printed text "Plantas de Cuba, Récoltées par Ramon De La Sagra, Don de M. le Général Paris, à Dinard, le 21 avril 1899." On the sheet are affixed two branches with numerous leaves, with inflorescences with flowers in anthesis. This specimen is a possible isolectotype.

Chiococca parvifolia Wullschl. ex Griseb., Fl. Brit. W. I. 337. 1861. *Chiococca alba* var. *parvifolia* (Wullschl. ex Griseb.) Urb., Symb. Antill. 8:675. 1921. *Chiococca alba* subsp. *parvifolia* (Wullschl. ex Griseb.) Steyerm., Acta Bot. Venez. 6:138. 1972 ["1971"]. TYPE: JAMAICA: Fairfield, 1849, *H.R. Wullschlaegel 856* (FIRST-STEP LECTOTYPE (Steyermark 1972a ["1971"]:138), SECOND-STEP LECTOTYPE (Franck et al. 2021:49): M [M-0187133]).

Notes.—Grisebach (1861:337) in the protologue of *Chiococca parvifolia* Wullschl. ex Griseb., cited the following gatherings: *Wullschlagel s.n.* and *March s.n.* from Jamaica, *Wullschlagel s.n.* from Antigua, and "*Cr.*" from Trinidad. Steyermark (1972a ["1971"]:138; 1972b:381) treated *C. parvifolia* as a subspecies of *C. alba*, and cited the type as "Jamaica, Wullschlagel." Along with that citation, Steyermark (1972b:381) wrote "I have examined a collection of *March* from Jamaica in 1765 deposited at NY. It is an isosyntype and is mentioned by Grisebach in his original citation of specimens examined." According to the *Code* (Turland et al. 2018), Steyermark's citation of *March* from Jamaica of NY specimen, barcode NY00099444, as an isosyntype cannot be corrected. Footnote 1 to Art. 9.4 of the *Code* defines an isosyntype as a duplicate of a syntype, which means that Steyermark used the term correctly. Therefore, it cannot be corrected because, according to Art. 9.10 of the *Code*, a term denoting a type can only be corrected when it is used in a sense other than in which it is defined. According to Art. 9.17 of the *Code*, Steyermark's (1972a ["1971"]:138) citation of the type for *C. alba* subsp. *parviflora* as, "Type. Jamaica, *Wullschlaegel*" is a first-step lectotypification. In M there is a specimens of *Wullschlaegel 856*, barcode M-0187133, with the handwritten annotations "856. Chiococca […] Fairfield Jamaica Wullschlaegel 1849." It consists of two small branches with numerous small leaves, and numerous inflorescences with flowers in anthesis. This specimen was designated as the second-step lectotype of this name by Franck et al. (2021:49).

Steyermark (1972:380–384) treated *Chiococca parvifolia* as a subspecies of *C. alba*. He distinguished subsp. *alba* from subsp. *parvifolia* by having inflorescences generally 3.5–8.5 cm long, the peduncles generally 1.2–3 cm long (vs. inflorescences 0.5–3.5 cm long, the peduncle 0.4–1.5 cm long in subsp. *parvifolia*); flowers usually (6–)9–27 (–39) in an inflorescence (vs. flowers usually 5–8 in an inflorescence); leaves 4.8–11 × (1.2–)2–4.5 cm, usually (1.6–)2–4 times longer than broad, acute or acuminate (vs. leaves 2–6 × 0.9–3, 1.5–2.5(–2.8) times longer than broad, often obtuse at apex). Borhidi et al. (2017:70–71) in the key to the Cuban species of *Chiococca*, distinguished *C. parvifolia* from *C. alba* by the leaves obtuse, smaller (vs. acute to acuminate in *C. alba*), stipules 1.5 mm long (vs. 2–2.5 mm long), corollas white or purple (vs. yellow), corolla tubes 2.5–4 mm long (vs. 4–8 mm long). A comparison of numerous specimens from throughout the geographic distribution, showed that the caracters used by Steyermark and Borhidi to distinguish them as separate taxa are amply intergarding. Hence, *C. parvifolia* and *C. alba* are here treated as synonymous, without any infraspecific taxa recognized.

Franck et al. (2021:45), in a key to *Chiococca* species from Florida, distinguished *C. parviflora* from *C. pinetorum* by being a "plant 0.1–3.5 m tall; longer stems usually > 1.5 m long; larger leaves >3 cm long, >13 mm wide, mostly 2.5–5 cm; inflorescence peduncle + rachis 0.5–4 cm long; of hammocks, swamps, pinelands, and prairies; and *C. pinetorum* by being a "plant 0.1–0.5(–1) m tall; longer stems <1 (1.5) m long; larger leaves >3.1(3.8) cm long <13 mm wide, mostly 1–3 cm long; inflorescence peduncle + rachis 0.5–2 cm long; of pine rockland."

Chiococca racemosa var. *jacquiniana* Griseb., Fl. Brit. W. I.:337. 1861.

***Notes.*—**Grisebach (1864:337) intended *Chiococca racemosa* var. *jacquiniana* Griseb. as the typical variety, but the typical variety of this species is var. *racemosa*.

Chiococca latifolia Raf., Alsogr. Amer. 75. 1838. Type: CUBA: without locality, s.d., *Jalambic s.n.* (lectotype (Franck et al. 2021:46): DWC n.v.).

Chiococca macrocarpa M. Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 11(1):230. 1844. Type: MEXICO. Vera Cruz: Mirador, Jun.–Oct 1840, *H. Galeotti 7064* (holotype, BR [000000530537]).

***Notes.*—**Martens and Galeotti (1844:230–231), in the protologue of *Chiococca macrocarpa* M. Martens & Galeotti, cited the gathering *Galeotti 7064*, and the locality "Mirador," without citing the herbarium of deposit. In BR there is a sole specimen, with barcode 000000530537, annotated with this name, which is the holotype.

Chiococca brachiata var. α *grandifolia* Müll. Arg. in Martius et al., Fl. Bras. 6(5):50. 1881. Type: PERU: Tarapoto, 1855–1856, *R. Spruce 3933* (**lectotype, here designated:** G [G00389863]; isolectotypes: BR [2 sheets, 000000557803, 000000557738]).

Chiococca brachiata var. β *genuina* Müll. Arg., in Martius et al., Fl. Bras. 6(5):51. 1881. Type: BRAZIL. São Paulo: without locality, s.d., *W.J. Burchell 3214* (**lectotype, here designated:** BR [000000558529]; isolectotype: GH [00257763]).

Chiococca brachiata var. γ *valida* Müll. Arg. in Martius et al., Fl. Bras. 6(5):51. 1881. Type: BRAZIL. Bahia: without locality, 1834, *J.S. Blanchet 1156* (**lectotype, here designated:** G [G00389835]).

Chiococca brachiata var. δ *conjungens* Müll. Arg., in Martius et al., Fl. Bras. 6(5):51. 1881. Type: BRAZIL. Rio de Janeiro: Without locality, s.d., *L. Riedel 368* (**lectotype, here designated:** BR [000000530739, specimen on the right side of the sheet)]).

Chiococca brachiata var. ε *intercedens* Müll. Arg., in Martius et al., Fl. Bras. 6(5):52. 1881. Type: BRAZIL. Minas Gerais: Lagoa Santa, s.d., *E. Warming s.n.* (holotype: G [G00389862]).

Chiococca brachiata var. ζ *biformis* Müll. Arg., in Martius et al., Fl. Bras. 6(5):52. 1881. Type: BRAZIL. Rio de Janeiro: without locality, Sep 1836, *Ildephonso Gomez [A.I. Gomes de Freitas] 23* (**lectotype, here designated:** G [G00389876]).

Chiococca brachiata var. η *intermedia* Müll. Arg., in Martius et al., Fl. Bras. 6(5):52. 1881. Type: BRAZIL. Minas Gerais: "Prope Fachada," Nov 1824, *L. Riedel 854* (**lectotype, here designated:** BR [000000530741]).

Chiococca brachiata var. θ *diplomorpha* Müll. Arg., in Martius et al., Fl. Bras. 6(5):52. 1881. Type: BRAZIL. Goiás: "prope urbem Goyaz" [town of Goiás], s.d., *W.J. Burchell 6524* (**lectotype, here designated:** BR [000000530674]; isolectotype: GH [00257762]).

Chiococca brachiata var. ι *rigidula* Müll. Arg., in Martius et al., Fl. Bras. 6(5):53. 1881. Type: BRAZIL. Bahia: "parte meridionali prov. Bahia," 1840, *J.S. Blanchet 3108A* (**lectotype, here designated:** G [G00389843]; isolectotypes: G [G00389885], W [No. W0027947]).

Chiococca brachiata var. λ *acutifolia* Müll. Arg., in Martius et al., Fl. Bras. 6(5):53, tab. 7. 1881. Type: BRAZIL. Rio de Janeiro: Without locality, s.d., *A.F.M. Glaziou 3034* (**lectotype, here designated:** BR [000000530506]).

Chiococca brachiata var. μ *microphylla* Müll. Arg., in Martius et al., Fl. Bras. 6(5):53. 1881. Type: BRAZIL. Bahia: without locality, s.d., *J.S. Blanchet 3276* (**lectotype, here designated:** BR [000000530678]).

Chiococca brachiata var. ν *acuminata* Müll. Arg., in Martius et al., Fl. Bras. 6(5):53. 1881. Type: BRAZIL. Mato Grosso: Cuiabá, "ubi ab incolis Caringa nuncupatur," 1832, *M. da Silva Manso 24* (**lectotype, here designated:** G [G00389881]).

Chiococca brachiata var. ξ *subrhombea* Müll. Arg., in Martius et al., Fl. Bras. 6(5):54. 1881. Type: BRAZIL. Rio de Janeiro: "prope Rio de Janeiro," s.d., *W.J. Burchell 2774* (**lectotype, here designated:** BR [000000530677]).

Chiococca brachiata var. ο *lanceolata* Müll. Arg., in Martius et al., Fl. Bras. 6(5):54. 1881. Type: BRAZIL. Minas Gerais: Caldas, "opp. Caldas in cafioes," Dec 1854, *A. Lindberg 97b* (**lectotype, here designated:** BR [000000530708]).

Chiococca brachiata var. π *petiolaris* Müll. Arg., in Martius et al., Fl. Bras. 6(5):54. 1881. Type: BRAZIL. Bahia: "ad Igreja Velha," 1841, *J.S. Blanchet 3276* (**lectotype, here designated:** G [G00389853]; isolectotype: BR [000000530711).

Chiococca brachiata var. *tenuifolia* Müll. Arg., in Martius et al., Fl. Bras. 6(5):458. 1881. Type: BRAZIL. Rio de Janeiro: without locality, s.d., *A.F.M. Glaziou 10941* (**lectotype, here designated:** G [G00389837]).

Chiococca micrantha J.R. Johnst., Proc. Amer. Acad. Arts 40:696. 1905; Proc. Bot. Soc. Nat. Hist. 34:t. 29, f. 3a-c. 1909. *Chiococca alba* (L.) Hitchc. var. *micrantha* (J.R. Johnst.) Steyerm., Acta Bot. Venez. 6:139. 1971. Type: VENEZUELA. Nueva Esparta: Island of Margarita, San Juan Mountains, woods above South Hill, 27 Jul 1903, *J.R. Johnston 115* (lectotype (Howard 1989:399, as "holotype"): GH [00057576]; isolectotypes: F [No. 1745174], G [2 sheets, G00389832], K [000432648], NY [00099439], US [00138518]).

***Notes.*—**Johnston (1905:696–697), in an article entitled "New plants from the Islands of Margarita and Coche, Venezuela," described *Chiococca micrantha* J.R. Johnst. In the protologue, he cited the material studied as "San Juan Mts., in woods above South hill, alt. 400 m, Johnston, no. 115, July 27, 1903," without citing the herbarium of deposit. Howard (1989:399) cited the type of this name as "Type: Johnston 115 (holotype GH!). Although Johnston's label on the holotype indicates a collection from the Island of Margarita, Steyermark (Fl. Venezuela 9:886. 1974) attributes the collection to Cerro de San Juan, Edo. Nueva Esparta, Venezuela." Howard's correction is accurate, as the label of the GH specimen has the heading "Plants of the Island of Margarita, Venezuela."

Chiococca bermudiana S. Br., Proc. Acad. Nat. Sci. Philadelphia 61:493. 1910. Type: BERMUDA: north shore, near Flatts, Mt. Langdon, 31 Aug.–20 Sep 1905, *S. Brown & N.L. Britton 181* (holotype: PH [00005273]; isotypes: A [00057578], F [No. 203773], GH [00057577], PH [00005272]).

Chiococca racemosa var. *yucatana* Loes., Repert. Spec. Nov. Regni Veg. 18(524/530):361. 1922. Type: MEXICO. Yucatan: "im distrikt Ticul, auf der Hacienda Yaxché im Walde," *E. Seler & C. Seler 5591* (B, destroyed). MEXICO: Yucatan: 4 km W of Buctzotz, sobre la carrera Tizimin–Merida, 21°11′N, 88°49′W, 24 Jul 1987, *E.F. Cabrera C. & H. Cabrera 13715* (**neotype, here designated:** MO [No. 3927696, barcode MO-508961]).

Notes.—Loesener (1922:361) in the protologue of *Chiococca racemosa* var. *yucatana* Loes., cited the gathering *Seler 5591*, without citing the herbarium of deposit. According to Stafleu and Cowan (1981:141), Loesener's original material was at B. That material was destroyed during WWII. A general search in numerous herbaria did not retrieve any original specimen. Hence, a neotype needs to be designated for this name. The specimen *Cabrera & Cabrera 13715* at MO, accession number 3927696, barcode MO-508961, is here designated as the neotype of this name.

Chiococca alba ssp. *parvifolia* var. *micrantha* f. *pilosa* Steyerm., Acta Bot. Venez. 6:141. 1972 ["1971"]. Type: VENEZUELA. Lara: Cercanías de Barquisimento, near la Ruesga, Aug 1923, *J. Saer 4* (holotype: VEN [No. 15153]; isotype: US [00138510]).

Chiococca parviflora R.O. Williams & Cheesman, in R.O. Williams, Fl. Trinidad & Tobago 2:29. 1928, *orth. var.* of *Chiococca parvifolia*

Chiococca petenensis Lundell, Wrightia 5(1):7. 1972. *Chiococca petensis* Lundell, Wrightia 5(1):7. 1972, *orth. var.* Type: GUATEMALA. Peten: Dolores, forest on Santo Toribio, 7 Jun 1961, *E. Contreras 2439* (holotype: LL [00000270]; isotypes: LL [00373120], S [2 sheets, Nos. S10-24110, S05-995]).

Chiococca trisperma Hook. f., Trans. Linn. Soc. London 20:219. 1847. Type: ECUADOR. Galapagos Islands: Chatam Island, Sep 1835, *C.R. Darwin 109* (lectotype (Porter 1980): CGE n.v.; isolectotypes: K [one sheet, K000432644, K000432646]).

Notes.—Joseph Dalton Hooker (1847:219), in the protologue of *Chiococca trisperma* Hook. f., cited the material studied as "*Hab.* Chatam Island, *Charles Darwin, Esq.*," without citing the herbarium of deposit. Porter (1980) designated as lectotype of this name a specimen in CGE. In K there is one sheet, on which are affixed two specimens. The specimen on the upper portion of the sheet, with barcode K000432646, has a label with the handwritten annotation "109. Chiococca trisperma Nob. Galapagos." The specimen on the left side of the sheet, barcode K000432644, has the stamp "Herbarium Hookerianum" and the handwritten annotation "Chatam Island, Galapagos, C. Darwin" handwritten by Hooker. These two K specimens, affixed on the same sheet, are isolectotypes of *C. trisperma*.

Chiococca trisperma f. *angustifolia* Andersson, Kongl. Vetensk. Acad. Handl. 1853:193. 1855 ["1853"]. Type: ECUADOR. Galapagos Islands: Albermarle Island, "insula A bermarle a Dr Macroe lectam," s.d., *Macroe s.n.* (not found).

2. Chiococca auyantepuiensis Steyerm., Mem. New York Bot. Gard. 23:374. 1972. Type: VENEZUELA. Bolívar: Auyán-tepui, near Río Lomita Camp, 1800 m, 10 May 1964, *J.A. Steyermark 93652* (holotype: VEN [No. 15495]).

Distribution.—Venezuela (Auyán-Tepui).

3. Chiococca belizensis Lundell, Amer. Midl. Naturalist 29:492. 1943. Type: BELIZE. ["British Honduras"]. Toledo Distr.: Cow Pen, near Monkey River, 2 Sep 1942, *P.H. Gentle 4115* (holotype: MICH [1210532]; isotypes: A [00057582], F [No. 1258120], LL [00000266], MO [No. 1253527], NY [00099446], US [00138511]).

Distribution.—From southern Mexico to Colombia and Peru.

Chiococca durifolia Dwyer, Ann. Missouri Bot. Gard. 67:87. 1980. Type: PANAMA: Coclé: La Mesa, above El Valle, 3 Jan 1974, *J.D. Dwyer 11865* (holotype: MO [No. 2188155]; isotypes: GH [00257767])

4. Chiococca capitata Wernham, J. Bot. 51:323. 1913. Type: JAMAICA: without locality, s.d., *W. Wright s.n.* (holotype: BM [000551619]). https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.bm000551619

Distribution.—Jamaica.

Notes.—Wernham (1913:323) distinguished *Chiococca capitata* Wernham by the congested subcapitate cymes and the tubulose-infundibular corolla with minute lobes reflexed at anthesis. He described the congested inflorescences as "Heads barely 1 cm in diameter, even including the corollas." Adams (1972), in *Flowering Plants of Jamaica*, did not mention this name. The combination of congested inflorescences, which is unique within the genus, and the narrowly tubular corollas, is diagnostic in recognizing it as distinct species. To my knowledge, this species is only known by the holotype specimen in BM, with barcode 000551619.

5. Chiococca caputensis D.H.Lorence & C.M.Taylor, Novon 5:201. 1995. Type: PANAMA. Panama: Cerro Jefe, NE of Panama City, 850–900 m, 12 Jul 1986, *G. McPherson 9744* (holotype: MO [No. 3624428]; isotype: PMA [No. 035797]).

Distribution.—Panama (Cerro Jefe).

6. Chiococca coriacea M. Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 11(1):231. 1844. *Chiococca racemosa* var. *coriacea* (M. Martens & Galeotti) Oerst., Vidensk. Meddel. Dansk. Naturhist. Foren. Kjobenhavn 1852 (2–4):40. 1853. Type: MEXICO. Vera Cruz: environs de Vera Cruz, s.d., *J.J. Linden 423* (holotype: BR [000000530743]; isotype: BR [000000530570]).

Distribution.—Mexico (Tamaulipas, Veracruz).

7. Chiococca filipes Lundell, Contr. Univ. Michigan Herb. 7:53. 1942. Type: MEXICO. Chiapas: Nuevo Amatenango, 1300 m, 17 Jul 1941, *E. Matuda 4783* (holotype: MICH [1210533]; isotypes: A [00057583], LL [00000267], MEXU [MEXU00084035], MO [No. 1219325], NY [00099445], US [00138516]).

Distribution.—Mexico (Chiapas, Oaxaca).

8. Chiococca grandiflora Lorence & T.Van Devender, in D.H. Lorence, T.R. Van Deventer & G.M. Ferguson, Phytokeys 98:74, figs. 1–3. 2018. TYPE: MEXICO. SONORA: Mun. Alamos, near Tepopa, NNW of Chirobo, 1100–1400 m, 22 Aug 1992, *P.S. Martin, P. Comtois, C. Lindquist, S.A. Meyer, B. Risner, & D.A. Yetman s.n. sub P. Jenkins 92-135* (HOLOTYPE: ARIZ [309922]; ISOTYPES: ARIZ [383348], PTBG [105887]).

Distribution.—Mexico (Sonora).

9. Chiococca henricksonii M.C.Johnst., Madroño 28:30. 1981. TYPE: MEXICO. COAHUILA: 1–2 km N of Puerto Colorado, near crest at SW end of Sierra de La Fragua, above 1750 m, 2 Sep 1941, *I.M. Johnston 8738* (HOLOTYPE: LL [00000268]; ISOTYPES: F [No. 1723223], GH [00057580], MICH n.v.).

Distribution.—Mexico (Coahuila).

10. Chiococca lucens Standl. & Steyerm., Fieldiana, Bot. 28:571, fig. 122. 1953. TYPE: VENEZUELA. BOLÍVAR: Sororopán-tepui, between quebrada and summit, 2130–2250 m, 15 Nov 1944, *J.A. Steyermark 60184* (HOLOTYPE: F [No. 1182124]; ISOTYPES: F [No. 118191], US [00138517], VEN [No. 25401]).

Distribution.—Venezuela (Bolívar).

11. Chiococca motleyana Borhidi, Acta Bot. Hung. 53:268. 2011. *Asemnantha pubescens* Hook.f., in Hook. Icon. Pl. 12:40. Apr 1873 (as "*Asemnanthe pubescens*"). *Asemnantha pubescens* Hook.f., in Bentham & J.D. Hooker, Gen. Pl. 107. 7–9 Apr 1873. TYPE: MEXICO. YUCATÁN: "in sylvis humidis Yucatan ad Chiapas lecta," s.d., *J.J. Linden 1264bis* (HOLOTYPE: K [K000432633]).

Distribution.—Mexico (Campeche, Quintana Roo, Yucatán), Guatemala, Belize.

12. Chiococca nitida Benth., Hooker's J. Bot. 3:236. 1841. [Delprete, Rev. Biol. Neotrop. 1:4–10. 2005 ["2004"]; Jardim et al., Phytotaxa 202(1):15–25. 2015]. TYPE: GUYANA: near Mt. Roraima, 1839, *Rob.H. Schomburgk ser. I, 1055* (**LECTOTYPE, here designated:** K [K000173187]; ISOLECTOTYPES: BM [000551614], F [No. 767823], G [G00389943], L [L0057946], NY [00099436], photo-K at NY).

Distribution.—Venezuela, Guyana, French Guiana, Brazil (Amazonas, Pará, Rondônia, Bahia), and Peru.

Chiococca nitida Benth. var. *amazonica* Muell. Arg. in Martius et al., Fl. Bras. 6(5):50. 1881. TYPE: BRAZIL. PARÁ: Caripi, juxta Pará [now city of Belém], Aug 1849, *R. Spruce s.n.* (HOLOTYPE: G [G00389944]; ISOTYPES: GH [00257766], M [M-0187135], TCD [TCD0005809]; photo-G at NY).

Chiococca erubescens Wernham, J. Bot. 51:322 (1913). TYPE: FRENCH GUIANA: without locality, s.d., *J. Martin s.n.* (LECTOTYPE (Steyermark 1972:376): K [K000432651]; ISOLECTOTYPE: K [K000432650]).

Chiococca cordata Cowan, Brittonia 7:411. 1952. *Chiococca nitida* Benth. var. *amazonica* Muell. Arg. f. *cordata* (Cowan) Steyerm., Mem. New York Bot. Gard. 23:373 (1972). TYPE: GUYANA: Kanuku Mts., Soirntau, 725 m, Sep 1948, *G. Wilson-Browne 230* (*Forest Dept. 5707*) (HOLOTYPE: NY [00099441]; ISOTYPE: K [K000432649])

Notes.—Cowan (1952:411–412), in the protologue of *Chiococca cordata* Cowan, cited the type as "Type: *Wilson-Browne 230* (*F. D. 5707*) (NY)." The NY specimen with barcode 00099441 has an isotype label, and "holotype" handwritten in pencil. It is the only specimen of *Wilson-Browne 230* at NY and is the holotype of this taxon.

Chiococca multipedunculata Steyerm., Mem. New York Bot. Gard. 23:373. 1972. TYPE: GUYANA: Potaro Distr., Mt. Kanaima, 485 m, 20 Aug 1959, *B.A. Whitton 120* (HOLOTYPE: NY [00099438]; ISOTYPE: U [U0099834]).

Chiococca nitida var. *chimantensis* Steyerm., Mem. New York Bot. Gard. 23:376. 1972. TYPE: VENEZUELA. BOLÍVAR: Chimantá Massif, SW facing portion of Chimantá-tepui, 1410 m, 15 May 1953, *J.A. Steyermark 75406* (HOLOTYPE: VEN [No. 71471]; ISOTYPES: BM [000551618], F n.v., MO [2 sheets, Nos. 2012043, 2011333], NY [00099434], WIS [v 0262263 WIS]).

13. Chiococca oaxacana Standl , Publ. Field Mus. Nat. Hist., Bot. Ser. 22:383. 1940. TYPE: MEXICO. OAXACA: Cerro San Antonio, 1650 m, 26 Jun 1906, *C. Conzatti 1418* (HOLOTYPE: F [No. 579006]; ISOTYPES: GH [00244641 (frag.)], MEXU [2 sheets, MEXU00033025, MEXU00534928], US [00289016]).

Distribution.—Mexico (Morelos, Oaxaca, Puebla, Tamaulipas).

14. Chiococca pachyphylla Wernham, J. Bot. 51:323. 1913. TYPE: MEXICO. VERACRUZ: Between Acatlán and Chiconquiaco, Sep 1829, *C.J.W. Schiede & F. Deppe s.n.* (HOLOTYPE: BM [000551613]).

Distribution.—Mexico, Belize, Guatemala, Honduras, El Salvador, and Nicaragua).

Chiococca mexicana Lundell, Wrightia 5:71. 1974. TYPE: MEXICO. PUEBLA: Tespilco, Mun. Zacapoaxtla, 1800 m, 23 Apr 1970, *F. Ventura A. 955* (HOLOTYPE: LL [00000269]; ISOTYPES: ENCB [ENCB003697], F [No. 1706520], MICH [1210521]).

15. Chiococca petrina Wiggins, Contr. Dudley Herb. 3:76, tab. 20, fig. 5–13. 1940. TYPE: MEXICO. Sonora: gorge of andesitic rock 23 mi S of Divisadero, 26 Sep 1934, *I.L. Wiggins 7493* (HOLOTYPE: DS [DS No. 263330, CAS barcode 0026742]; ISOTYPES: A [00257760], ARIZ [ARIZ-BOT-0004895], F [No. 11108857], LL [00000271], UC [UC 665454], US [00138519]).

Distribution.—Mexico (Chihuahua, Coahuila, Sinaloa, Sonora).

16. Chiococca phaenostemon Schltdl , Linnaea 9:594. 1835. TYPE: MEXICO. VERACRUZ: Hacienda de la Laguna, July 1829, *C.J.W. Schiede & F. Deppe s.n.* (**LECTOTYPE, here designated:** HAL [HAL 163504]; POSSIBLE ISOLECTOTYPES: HAL [HAL 163502 ("Sep 1828")], HAL [HAL 163513 ("Sep 1828")]).

Distribution.—Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama.

Notes.—Schlechtendal (1835:594–595), in the protologue of *Chiococca phaenostemon* Schltdl., cited the material studied as "255. *Chiococca phaenostemon* n. sp., "Chiococca racemosa Linn. V. 166, n. 382" (p. 594), and "In sylvis Jalapae, ad Hac. d. l. Laguna" (p. 595). As indicated in his citation, the gathering *Schiede & Dieppe* was previously cited as "382. *Chiococca racemosa* L." by Schlechtendal and Chamisso (1830:166). Schlechtendal organized the gatherings in systematic order according to Kunth's system of classification, not using gathering numbers or order of collection. Therefore, "*382*" is not a gathering number. None of the labels attributed to Schiede have a gathering number, so they are all *Schiede & Deppe s.n.* Labels with the number "*382*" were all prepared by Schlechtendal.

Lorence (1999:35) discussed the original material of this name as "collector not cited (Holotype presumably HAL, n.v.). Note: no actual specimen or collector(s) were cited in Schlechtendal's protologue (1834) [1835] […]. There is a *Schiede 255* specimen in Paris (with duplicate at MO) […], therefore the *Schiede 255* specimens at P and MO are very likely original material, probably isotypes. However, mention of "Jalapa" suggests that Schlechtendal may have been referring to another collection (syntype) as well." Schlechtendal's statement "In sylvis Jalapae, ad Hac. d. l. Laguna" means that the gathering was collected in the forest in the province of Jalapa, near the Hacienda de la Laguna.

In HAL, there are four specimens collected in Mexico by Schiede and Deppe, with labels reporting different collection dates. The specimen with barcode HAL 163503, has a label with the annotation "Chiococca sp. In sylvis Jalapae, Maj 29 [May 1829], Frutex scandent, floribus flavis, fructibus albis" handwritten by Schiede. This specimen is *Schiede & Deppe s.n.*, collected in May 1829. There is no evidence on the sheet that this specimen was studied by Schlechtendal. This specimen consists of three branches with inflorescences with flower buds and flowers in anthesis.

The HAL specimen with barcode HAL 163504, has two labels. One label has the annotation "Chiococca, Haz. de la Laguna, Jul. 29 [July 1829]" handwritten by Schiede. The other label has the annotation "Chiococca racemosa L. Linn. [Linnaea] V. p. 166. n. 382" handwritten by Schlechtendal. This specimen is a possible duplicate of *Schiede & Deppe "382,"* because the collection date reported on the label is July 1829. This specimen consists of three branches with infructescences with young and mature fruits, and is original material. This specimen is here designated as the lectotype of *C. phaenostemon*.

The HAL specimen with barcode HAL 163502, has two labels. One label has the annotation "Ignota, baccis albis, prope H. Laguna, Sept. 28 [September 1828]" handwritten by Schiede. The other label has the annotation "382. Chiococca racemosa L." handwritten by Schlechtendal. This specimen is a possible duplicate of *Schiede & Deppe "382"* with barcode HAL 163504. However, the collection date reported on the label is September 1828. This specimen consists of a single branch with infructescences with young fruits, and is possible original material.

The HAL specimen with barcode HAL 163513, has a single original label with the annotation "382. Mexicis. Chiococca racemosa L. Hacienda de la Laguna Sept. Deppe & Schiede" handwritten by Schlechtendal. This specimen is a duplicate of *Schiede & Deppe "382,"* collected in September. The year of collection is not indicated, but most likely is 1828. This specimen, consists of a medium sized branch and a small branch, both of them with infructescences and small fruits, and is possible original material.

A specimen in NY, barcode 00169716, has a label with the annotation "255. Chiococca phaenostemon n.sp. Schltdl.! in Linnaea 9. p. 594. Chiococca racemosa Cham. & Schltdl.! il. 5. p. 166. In sylvis Jalapae, C. Schiede. Com. ill. de Schlechtendal 1834." The specimen consists of a simple branch with several leaves and two pairs of axillary inflorescences. This specimen is original material.

A specimen in MO, accession number 3576927, has a label with the annotation "255. Chiococca phaenostemon" handwritten by Schlechtendal. The specimen consists of three branches with numerous leaves and axillary inflorescences, some of them with flowers in anthesis.

A specimen in K, barcode K000432657, has a label with the annotations "Chiococca phaenostemon Schltdl. Linnaea 9. 594. Haz. de la Laguna. Jul. 29. C. racemosa viz differt." handwritten by several authors.

The GOET specimen, barcode GOET010209, has a label with the annotation "1. Chiococca phaenostemon n. sp. Prov. Jalapa. Comm. Cl. dr. Schlechtendal 1839." probably handwritten by Schlechtendal.

A specimen in GH, barcode 00057579, has a label with the annotation "Chiococca phaenostemon n. sp. Prov. Jalapa" handwritten by Schlechtendal. The collector or the collection number is not reported on the label. The specimen consists of a small branch with four leaves, and a branch with several leaf pairs and two pairs of axillary inflorescences, with flower buds and flowers in anthesis.

A specimen in BM, barcode 000551612, has a label with the annotation "Chiococca, Haz. de la Laguna, Jul. 29" handwritten by an unknown author (Schiede?). There is no evidence on the sheet that it was studied by Schlechtendal. The specimen consists of a branch with a pair of axillary infructescences with mature fruits.

Chiococca staminea M. Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 11(1):231. 1844. Type: MEXICO. Veracruz: Jalapa ["environs de Xalapa"], s.d., *J. Linden 48* (holotype: BR [000000530710]).

17. Chiococca pinetorum Britton, Publ. Field Columb. Mus., Bot. Ser. 2(3):171. 1906. Type: BAHAMAS: New Providence, near Nassau, 1 Sep 1904, *N.L. Britton & L.J.K. Brace 430* (lectotype (Franck et al. 2021: 53): NY [00099443]; isolectotypes: F [No. 171854], K [K000432652], US [00138520]).

Distribution.—Southern USA (Florida), and Bahama Archipelago.

Notes.—Britton (1906: 171) in the protologue of *Chiococca pinetorum* Britton, cited as type the gathering *Britton & Brace 430* without indicating the herbarium of deposit. At the time he published this name, he was the Director of the New York Botanical Garden. In NY there is a specimen, barcode 00099443, which has a label with the heading "The New York Botanical Garden, Exploration of the Bahamas, New Province" and the annotation "Type. 430. Chiococca pinetorum Britton, Pinelands, Harold Road" handwritten by Britton. Above that label is affixed a field label with the annotation "430. C. pinetorum. Cor. white, veined with purple" handwritten by Britton. The specimens consists of a long branch with numerous lateral branches, numerous small leaves, and several infructescences with mature fruits. This specimen was designated as the lectotype of *C. pinetorum* by Franck et al. (2021:53).

The specimen of *Britton & Brace 430* in F, accession number 171854, has a "holotype" label made by W.T. Gillis in July 1974. It is unknown to me the reasoning of labelling this specimen as "holotype." It consists of a long branch with numerous lateral branches, numerous small leaves, and several infructescences with mature fruits. This specimen is an isolectotype.

18. Chiococca rubriflora Lundell, Wrightia 5:7. 1972. Type: GUATEMALA. Petén: in *corazoal*, W of km 165 of Poptum road, woody vine, flowers dark red outside, orange inside, 10 Sep 1969, *E. Contreras 9110* (holotype: LL [00000272]; isotypes: DUKE [10000635], F [No. 1968054], K [K000432654], LL [00373121], S [2 sheets, Nos. S05-997, S10-24087]).

Distribution.—Mexico (Chiapas) and Guatemala.

19. Chiococca semipilosa Standl. & Steyerm., Publ. Field Mus. Nat. Hist., Bot. Ser. 22:279. 1940. Type: GUATEMALA. Chiquimula: Caracol Mountain, 1.5 mi N of Quezaltepeque, 1200–1400 m, 7 Nov. 1939, *J.A. Steyermark 31406* (holotype: F [No. 1039351]).

Distribution.—Mexico, Guatemala, and Honduras.

Chiococca pubescens var. *peninsularis* Wiggins, Contr. Dudley Herb. 4:24. 1950. Type: MEXICO. Baja California: Sierra de San Francisquito, 18 Oct 1890, *T.S. Brandegee 265* (holotype: DS [No. 20437, barcode CAS0026743]; isotype: UC [UC102610]).

Chiococca pueblensis Lundell, Wrightia 5:7. 1972. *Chiococca pubescens* Standl., Contr. U.S. Natl. Herb. 20:209. 1919, *nom illeg. superfl.* Non Humb. & Bonpl. ex Schult. (Syst. Veg. 5:202. 1819). Type: MEXICO. Puebla: San Luis Tamaulipas, 320 m, Jul 1908, *C.A. Purpus 3334* (holotype: US [No. 810975]; isotypes: E [E00285117], F [No. 244045], G [G0038939]).

Chiococca vestita Lundell, Wrightia 5:8. 1972. Type: GUATEMALA. Petén: Poptun, 2 km E, in hammock in pineland, 13 Jul 1959, *C.L. Lundell 16425* (holotype: LL [00000273]; isotypes: S [No. S10-24103]).

Chiococca vestita var. *glaberrima* Lundell, Wrightia 5:9. 1972. Type: GUATEMALA. Petén: Poptun, 2 km E, in hammock in pineland, 13 Jul 1959, *C.L. Lundell 16425A* (holotype: LL [00000274]; isotypes: S [2 sheets, Nos. S05-998, S10-24114]).

Chiococca gracilis Borhidi, Acta Bot. Hung. 49:63. 2007. Type: GUATEMALA. Izabal: El Estor, margin of open nickel mine, 410 m, 30 Aug 1988, *W.D. Stevens & E. Martínez S. 25227* (holotype: MEXU [MEXU 00490722]; isotypes: MEXU [MEXU 01054938], MO [No. 4293149], PTBG [PTBG 1000000148]).

20. Chiococca sessilifolia Miranda, Anales Inst. Biol. Univ. Nac. México 21:306. 1951. TYPE: MEXICO. CHIAPAS: bajo hacia Las Vistas, N of Berriozábal, 24 Sep 1950, *F. Miranda 6672* (HOLOTYPE: MEXU [MEXU 00033024]; ISOTYPE: MEXU [MEXU 00074340]).

Distribution.—Mexico (Chiapas, Veracruz).

21. Chiococca steyermarkii Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 22:280. 1940. TYPE: GUATEMALA. SAN MARCOS: Río Vega, near San Rafael and Guatemala-Mexico boundary, Volcán de Tacaná, 2500–3000 m, 20 Feb 1940, *J.A. Steyermark 36237* (HOLOTYPE: F [No. 1043222]; ISOTYPES: EAP [EAP94019 (frag. ex F)], F [No. 1043229]).

Distribution.—Guatemala.

22. Chiococca stricta Correll, J. Arnold Arbor. 58:45, fig. 5. 1977. TYPE: BAHAMAS. CAT ISLAND: along trail on coppice-covered hills just N of New Bight, 23 Nov. 1975, *D.S. Correll 46265* (HOLOTYPE: A [00057575]; ISOTYPES: FTG n.v., NY [00099442]).

Distribution.—Bahama Archipelago.

CHIOCOCCA EXCLUDED TAXA

Chiococca alternifolia L., Syst. Nat., ed. 12, vol. 2:165. 1767, *nom. illeg. pro syn.*

Notes.—Linnaeus (1767:165) under *Chiococca racemosa* cited "Chiococca alternifolia *an Cestri species*?" Hence, *C. alternifolia* is an illegitimate name.

= *Cestrum alternifolium* (L.) O.E. Schulz, in Urban, Symb. Antill. 6:270. 1909. (Solanaceae).

Chiococca axillaris Moc. ex DC., Prodr. 4:483. 1830, not validly published.

= *Eumachia acuifolia* Delprete & J.H. Kirkbr., J. Bot. Inst. Texas 9:76. 2015.

Chiococca barbigera D. Dietr., Syn. Plant. 1:777. 1839.

= *Symphoricarpos microphyllus* (Humb. & Bonpl. ex Schult.) Kunth, in Humboldt et al., Nov. Gen. Sp. 3:424. 1820. (Caprifoliaceae).

Chiococca cubensis Urb., Symb. Antill. 9:163. 1921.

= *Ramonadoxa cubensis* (Urb.) Paudyal & Delprete (See below).

Chiococca jefensis Dwyer, Ann. Missouri Bot. Gard. 67:88. 1980. TYPE: PANAMA: Panamá, La Eneida, Cerro Jefe, 1 Jan 1968, *R.L. Dressler 3296* (HOLOTYPE: MO [No. 2228191]).

= *Elaeagia nitidifolia* Dwyer, Ann. Missouri Bot. Gard. 67:157. 1980.

Chiococca naiguatensis Steyerm., Acta Bot. Venez. 6:135, fig. 5. 1971.

= *Salzmannia naiguatensis* (Steyerm.) Paudyal & Delprete (See below).

Chiococca nocturna Jacq , Enum. Syst. Pl.:16. 1760. [*Chiococca nocturna* Moc. & Sessé, Fl. Mex., ed. 2:59. 1994, *nom. illeg. superfl.*]

= *Cestrum nocturnum* L., Sp. Pl.:191. 1753. (Solanaceae).

Chiococca nudiflora D. Dietr., Syn. Plant. 1:777. 1839, *nom illeg. pro syn.*

= *Eumachia acuifolia* Delprete & J.H. Kirkr., J. Bot. Res. Inst. Texas 9:76. 2015.

Chiococca paniculata L.f., Suppl. Pl.:145. 1782. TYPE: [COLOMBIA]: without locality, s.d., *J.C.B. Mutis 37* (LECTOTYPE (Moraes 2012: 19): LINN 233.3)

= *Palicourea paniculata* (L.f.) P.L.R.Moraes & C.M.Taylor, Phytotaxa 41:19. 2012.

Chiococca plowmannii Delprete, Rev. Biol. Neotrop. 1:5, fig. 1. 2005 ["2004"].

= *Salzmannia plowmannii* (Delprete) Paudyal & Delprete (See below).

Chiococca pulcherrima Wernham, J. Bot. 51:322. 1913.

= *Erithalis angustifolia* DC. (See below).

CHIOCOCCA DUBIOUS NAMES

Chiococca anguicida Niederl., Bol. Mens. Mus. Prod. Argent. 3(31):305. 1890. TYPE: Not traced.

Notes.—Although the original material of this name is from Argentina, it is not mentioned in the Rubiaceae treatement coordinated by Cabral and Salas (2022) of the *Flora Argentina*.

COUTAPORTLA

Urban (1923:146) described the genus *Coutaportla* Urb., with a sole species, *C. ghiesbreghtiana* (Baill.) Urb., using the basionym *Portlandia ghiesbreghtiana* Baill. He constructed the generic name from *Coutarea* and

Portlandia, indicating that it is somewhat intermediate between the two genera. Aiello (1979) maintained *Coutaportla* as a monotypic genus. She discussed the identity of *Portlandia guatemalensis* Standl. and positioned it close to *Coutaportla*, without publishing the necessary new combination because of lack of mature fruits. Lorence (1986) transferred *P. guatemalensis* to *Coutaportla*, and Borhidi (2003) transferred it to the monospecific *Locencea* Borhidi, which is here followed (See below). *Coutaportla* is characterized by the interpetiolar stipules, triangular or deltoid, inflorescences terminal, uni- or pauci-florous, 4(5)-merous flowers, laterally compressed hypanthium, white, pink or purple corollas, 2-locular ovary, with (1–)2–5 ovules per locules, placenta subapical, medial or basal, capsules laterally compressed, loculicidal (secondarily septicidal), and seeds dorso-ventrally compressed, wingless (Torres-Montúfar, 2024; Torres-Montúfar et al. 2023). In this genus are here included five species of shrubs or small trees (0.1–)0.5–3 m tall, four of them occurring in Mexico, and one in Venezuela.

Coutaportla Urb., Symb. Antill. 9:146. 1923; Lorence, Syst. Bot. 11(1):209–213. 1986; Villareal, Sida 12(1):223–225, f. 1. 1987; Ochoterena-Booth, Fl. Mesoamericana 4.2:69. 2012; Borhidi, Acta Bot. Hung. 60(1–2):31–45. 2018; Torres-Montúfar et al., Pl. Ecol. Evol. 156(1):5. 2023; Pío-León et al., Acta Bot. Mex. 130:e2167, f. 1–2. 2023; Torres-Montúfar, Acta Bot. Mex. 131:35–52. 2024. TYPE: *Coutaportla ghiesbreghtiana* Urb.

1. Coutaportla ghiesbreghtiana (Baill.) Urb., Symb. Antill. 9:147. 1923. *Portlandia ghiesbreghtiana* Baill., Adansonia 12:300. 1879. TYPE: MEXICO. OAXACA: Hda. Huijastla, 1842–43, *A. Ghiesbreght 27* (FIRST-STEP LECTOTYPE (Lorence 1999: 44), **SECOND-STEP LECTOTYPE, here designated:** P [P002273491]; ISOLECTOTYPES: F [No. 972609], G [G00436041, without collection number], P [P002273492], US [2 sheets, 00997912, 00137327, without collection number]).

Distribution.—Mexico (Oaxaca).

Notes.—Baillon (1879:300) described and discussed *Portlandia ghiesbreghtiana* Baill., but did not cite any collection or herbarium of deposit. Lorence (1999:44) cited the type of *Portlandia ghiesbreghtiana* as "[…] *Ghiesbreght 27* (Holotype P (photos MEXU, PTBG); Isotypes P, 3 sheets (photos MEXU), US (photos MEXU, PTBG))." Because he did not specify which specimen in P is the "holotype," Lorence's citation is a first-step lectotypification. In P, where Baillon worked, there are four specimens of *Ghiesbreght 27*. The specimen with barcode P002273491, has a label with the annotation "Portlandia Ghiesbreghtiana H. B. Sect. Coutaportla, Voy. Adansonia XII" handwritten by Baillon. This specimen is here designated as the second-step lectotype of this name.

The P specimen of *Ghiesbreght 27* with barcode P002273492, has a label with the annotation "Coutarea" handwritten by an unknown author, and "Ghiesbreghtiana H. B." handwritten by Baillon; this specimen is an isolectotype. The P specimens of *Ghiesbreght 27* with barcodes P002273493 and P002273494, have labels with the annotation "Coutarea Ghiesbreghtiana H. B." handwritten by Baillon; these specimens are isolectotypes.

2. Coutaportla helgae Pío-León, Torr.-Montúfar & H. Ávila, Acta Bot. Mex. 130:e2167, p. 3, figs. 1–2. 2023. TYPE: MEXICO: SINALOA: Mun. Cosalá, 600 m E of community Las Mimbres del Padre, 24°17′N, 106°46′W, 300 m, 17 Jan 2022, *J.F. Pío-León & J. Beltrán 289* (HOLOTYPE: CIIDIR n.v.; ISOTYPES: FESC n.v., HCIAD n.v., MEXU n.v., USON n.v.).

Distribution.—Mexico.

3. Coutaportla campanilla (DC.) Delprete, **comb. nov.** *Coutarea campanilla* DC., Prodr. 4:350. 1830. *Coutarea hexandra* var. *campanilla* (DC.) Steyerm., Mem. New York Bot. Gard. 23:297–299. 1972. TYPE: VENEZUELA: near Caracas, s.d., *Vargas s.n.* (HOLOTYPE: G-DC [2 sheets, G00665778 (one flower), G00665780 (two branches)]).

Distribution.—Venezuela (between Caracas and Mérida).

Notes.—In G-DC there are two sheets associated with *Coutarea campanilla* DC., which are kept together. The sheet with barcode G00665778, with a single flower in an envelope, has a label with the annotation "Coutarea campanilla DC" handwritten by Candolle. The sheet with barcode G00665780 does not have a label handwritten by Candolle, and consists of two branches with numerous leaves, one of them with an inflorescence with flower buds, and the other with an infructescence with several dehisced capsules. On top of those branches is affixed a label with the annotation "Vulgó-campanilla-fortaspe [? Illegible] ad gen. cinch. pertinet Barbacoan ad May 26 se halla junto con la pubescens-palida" handwritten by Vargas. According to Art. 8.3 of the *Code* (Turland et al. 2018), because the two sheets are kept together, with Candolle's annotation

on the first sheet, they are here treated as a single specimen with multiple preparations, which is the holotype of *C. campanilla* DC.

Coutaportla campanilla (DC.) Delprete is similar to *Coutarea hexandra* because of its terminal inflorescences and the lenticellate stems; from which it differs by the actinomorphic, 4-merous flowers; while in *C. hexandra* the flowers are zygomorphic, curved, bilaterally symmetrical, and commonly 6-merous. *Coutaportla campanilla* differs from *Coutarea alba* by having terminal inflorescences, while in *C. alba* they are usually axillary or terminal on lateral short shoots. *Coutarea campanilla* is here transferred to *Coutaportla* based on floral characters. Ovaries and fruits are needed, to confirm if they have the same kind of placentation found in the other species of *Coutaportla*, which have 2–5 ovules per locule, basally inserted. The addition of this species to *Coutaportla* extends the geographical range of the genus to Venezuela, while the other species occur in Mexico.

Coutarea lindeniana Baill., Adansonia 12:300. 1879. Type: VENEZUELA. Entre Caracas et Merida, s.d. [1842], *J.J. Linden 376* (holotype: P [P00559103]; isotype: G [G00436038]).

Notes.—Baillon (1879:300) in the protologue of *Coutarea lindeniana* Baill., cited the gathering *Linden 376* collected in Venezuela. In P there is a specimen that has a label with the annotations "Coutarea" handwritten by an unknown author, and "Lindeniana H. B." handwritten by Baillon. The P specimen is the holotype of this name. The specimens of *Linden 376* present in P and G have small, 4-merous, actinomorphic flowers.

4. Coutaportla lorenceana Torr.-Montúfar, Ochot.-Booth & Art. Castro, Pl. Ecol. Evol. 156(1):5. 2023. Type: MEXICO. Sinaloa: Mun. Concordia, El Palmito, alrededores del acceso principal al Santuario Chara Pinta; 23.56444°N, 105.848882°W, 1980 m, 10 Sep 2019, *A. Castro-Castro, Ávila-González & Zavala-Pérez 4532* (holotype: MEXU n.v.; isotypes: CIIDIR n.v., FCME n.v., FESC n.v., IEB n.v., IBUG n.v., MO n.v., PTBG n.v., SLPM n.v.).

Distribution.—Mexico.

Chiococca grandiflora Lorence & T.Van Devender *pro parte*, in D.H. Lorence, T.R. Van Deventer & G.M. Ferguson, Phytokeys 98:74, figs. 1–3. 2018. Paratypes cited in Lorence et al. (2018:76): *T. Walker s.n.* (ARIZ [212520]), *S. Walker s.n.* (UTC [00263027], ARIZ [181630]); *S. Walker 70043* (K).

5. Coutaportla pailensis Villareal, Sida 12:223, fig. 1. 1987. Type: MEXICO. Coahuila: Cerro de Paila, Cañon de Loma Prieta, NW de Hipólito, 25°51′N, 101°30′W, 6 Aug 1986, *J.A Villareal, M.A. Carranza & J. Whebe 3305* (holotype: MEXU [MEXU 00424882]; isotypes: ANSM n.v., ENCB [ENCB003687], TEX [00000020]).

Distribution.—Mexico.

COUTAPORTLA EXCLUDED TAXA

Coutaportla guatemalensis (Standl.) Lorence, Syst. Bot. 11:210. 1986. *Portlandia guatemalensis* Standl., J. Wash. Acad. Sci. 18:162. 1928.

= *Lorencea guatemalensis* (Standl.) Borhidi, Acta Bot. Hung. 45:17. 2003 (See below under *Lorencea guatemalensis*).

COUTAREA

Aublet (1775:314) published the genus *Coutarea* Aubl., with the sole species *C. speciosa* Aubl. [= *C. hexandra* (Jacq.) K. Schum.]. He supplied the French vernacular name "Coutar de la Guiane," suggesting that the generic name was of indigenous origin, which was probably "coutar," "kutar" or something similar. The position and delimitation of *Coutarea* has a complex history. Ochoterena-Booth (1994), completed a master thesis on the revision of *Coutarea*, which remained unpublished. A generic and specific description, with extensive synonymy, was published by Delprete (1999b, 2010, 2024). The genus is unique within the Chiococceae by the following combination of characters: shrubs or trees to 15 m tall (to 30 m tall in the Amazon Basin), young branches commonly lenticellate, inflorescences terminal (terminal on lateral short-shoots in *C. alba*), in simple or compound dichasia, flowers 6-merous, zygomorphic, stamens well-exserted, unequal, stigmatic portion in two lines along the style, capsules strongly laterally compressed, seeds large, winged, vertically imbricate. In the present treatment, two species are recognized in this genus, ranging from Mexico to Argentina.

Coutarea Aubl , Hist. Pl. Gui. Franç. 1:314, pl. 122. 1775; Standley, N. Amer. Fl. 32(2):126–128. 1921; Steyermark, Mem. New York Bot. Gard. 23:297–299. 1972; Steyermark, in Lasser & Steyermark, Fl. Venezuela 9(1):203–209, f. 29. 1974; Delprete in Andersson, Fl. Ecuador 62:44–50, f. 15–16. 1999; Borhidi, Rubiáceas México 145, 147, f. 29. 2006; Borhidi, Rubiáceas México, 2nd Ed 158, 160, f. 33. 2012;

Ochoterena-Booth, Fl. Mesoamericana 4.2:69–70. 2012; Aguirre Arbo & Salas in Zuloaga & Zanotti, Fl. Argentina 19(3):248–250, 2 figs. 2022. TYPE: *Coutarea speciosa* Aubl. [= *Coutarea hexandra* (Jacq.) K. Schum.].

1. Coutarea alba Griseb., Abh. Königl. Ges. Wiss. Göttingen 24:153. 1879. TYPE: ARGENTINA. JUJUY: [Depto. Ledesma], San Lorenzo, Nov. 1873, *P.G. Lorenz & G.H.W. Hieronymus 217* (LECTOTYPE (Aguirre Arbo & R.M. Salas in F.O. Zuloaga & C.A. Zanotti, Fl. Argentina 19(3):248. 2022): CORD [CORD00006240 & CORD00006241]; ISOLECTOTYPES: E [00514966], G [G00436040]).

Distribution.—Venezuela, Bolivia, Brazil, Paraguay, Argentina (Salta, Jujuy).

2. Coutarea hexandra (Jacq.) K. Schum , Fl. Bras. 6(6):196. 1889. *Portlandia hexandra* Jacq., Enum. Syst. Pl. 16. 1760 [Jacq., Select. Stirp. Amer. Hist. 182, f. 20. 1763]. TYPE: COLOMBIA. BOLÍVAR: vicinity of Cartagena, s.d., *Jacquin s.n.* (LECTOTYPE (Delprete 1999b:47): BM [000081660, one flower]).

Distribution.—From Mexico to Argentina (absent in the Greater Antilles).

Coutarea speciosa Aubl., Hist. Pl. Guiane 1:314, t. 122. 1775. *Portlandia speciosa* (Aubl.) Baillon, Hist. Pl. 7:381. 1880. *Coutarea hexandra* var. β *speciosa* K. Schum. in Martius et al., Fl. Bras. 6(6):197. 1889. TYPE: FRENCH GUIANA: "Caïenne & in sylvis Guianae," s.d., *Aublet s.n.* (NEOTYPE (Delprete 2015b:603): P-JU [No. 9927a, branch with flowers]; ISONEOTYPE: P-JU [No. 9927b, fruits and seeds]).

Portlandia acuminata Willd., in Roemer & Schultes, Syst. Veg., ed. 15[bis], 5:23. 1819. TYPE: VENEZUELA: Caracas, s.d., *F. Bredemeyer s.n.* (HOLOTYPE: B-W [B –W 03932 -01 0]).

Exostema souzanum Mart., in Martius & Spix, Reise Bras. 2:789. 1828. *Cinchona souzana* (Mart.) Brign., Mem. Mat. Fis. Soc. Ital. Sci. Modena, Pt. Mem. Fis., ser. 2, 1:63. 1862. TYPE: Not found.

Coutarea flavescens DC., Prodr. 4:350. 1830. TYPE: [icon.]: [MEXICO]. Torner Collection Plate No. 0734, in the Hunt Institute for Botanical Documentation (LECTOTYPE, McVaugh 2000: 463).

Notes.—Augustin Pyramus de Candolle (1830:350) in the protologue of *Coutarea flavescens* DC., stated "C. latiflora (fl. mex. ic. ined.) pediculis pluribus sub floribus ebracteatis, floris diametro longitudine dimidio ferè minore.— In Mexico. Folia superiora interdùm terna, ovalia basi attenuata. Pediculi ternato-verticillati bis bifidi ad ramificationes tautùm bracteati. Flores flavescentes minores et praesertìm angustiores quàm priorum." Therefore, the authority of this name should be attributed solely to him.

There is no original specimen of *Coutarea flavescens* in G, G-DC, or MA. McVaugh (1969, 1972, 1977, 1980, 1982, 1987, 1990, 1998, 2000), discussed in great detail the history, itinerary, herbarium, and illustrations of the Sessé & Mociño Expedition (1781–1803), which is below summarized under *Coutarea latiflora* DC. [= *Hintonia latiflora* (DC.) Bullock].

McVaugh (2000:463) cited the type of *Coutarea flavescens* as follows, "Lectotype: No. 0734 of the Torner Collection, annotated "Coutarea flava" by Alphonse de Candolle. DC. plate 459, as cited in Calques des Dessigns (Field Mus. neg. 30688), is an incomplete copy of Torner 0734. It is annotated "Coutarea flava" and, by Alphonse de Candolle, "Sans doute C. flavescens DC."

Ochoterena-Booth (2012:119) cited the type of "*Coutarea latiflora* Sessé et Moc. ex DC." as "Holotipo: México, Michoacán, *Sessé y Mociño s.n.* (G-DC!)." However, as explained above, the authority of this name should be attributed solely to Candolle, and there is no original specimen associated with this name in G-DC.

Coutarea pubescens Pohl, Pl. Bras. Icon. Descr. 2:148, tab. 200. 1833. *Coutarea hexandra* var. ε *pubescens* (Pohl) K. Schum. in Mart., Fl. Bras. 6(6):198. 1889. *Coutarea hexandra* f. *pubescens* (Pohl) Steyerm., Mem. New York Bot. Gard. 23:298. 1972. TYPE: BRAZIL: without locality, s.d., *J.B.E. Pohl s.n.* (**LECTOTYPE, here designated:** M [M-0187237]).

Coutarea mollis Cham., Linnaea 9:259. 1834. TYPE: BRAZIL: without locality, s.d., *C.F.P. Martius Herb. Fl. Brasil. No. 995* (**NEOTYPE, here designated:** M [M-0187239]).

Notes.—Chamisso (1834:259), in the protologue of *Coutarea mollis* Cham., cited the material studied as "E Brasilia aequinotialis misit Sellow" without citing the herbarium of deposit. A general search in numerous herbaria did not retrieve any original specimen associated with this name. Therefore, a neotype needs to be designated. A specimen in M, with barcode M-0187239, has the handwritten annotations "Coutarea pubescens Pohl, Martii Herbar. Florae Brasil. N° 995." The specimen consists of a ramified branch with lenticellate stems, numerous leaves, and terminal inflorescences with flowers in anthesis. This specimen is here designated as the neotype of *C. mollis*.

Notes about *Bignonia triflora* Vell. (Bignoniaceae)

Bignonia triflora Vell., Fl. Flum. 249. 1829 ["1825"]. TYPE: [icon. ined.] "Didyn. Angiosp. BIGNONIA trifolia [triflora] Tab. 38," Divisão de Manuscritos, Biblioteca Nacional, Rio de Janeiro, No. mss1198655_042 (LECTOTYPE, Nascimento et al. 2024).

Notes.—Delprete (1999b:47), treated "*Bignonia triflora* Pav. ex DC." (1830:148) as a synonym of *Coutarea hexandra*, and cited the type as "Type: Pavón s.n., Peru, Dept. Loreto (MA, not seen)." Alphonse de Candolle (1845:148), in the protologue of *Bignonia triflora*, wrote: "22. B. TRIFLORA (Vell. fl. flum. 6. t. 38), scandens, ramis teretibus; foliis conjugatis, petiolo simpliciter cirrhoso, foliolis ovatis acuminatis basi obtusis, petiolulis petiolo duplo brevioribus, pedunculis axillaribus brevissimis pedicellos 3 elongatos gerentibus, calyce campanulato-oblongo 5-dentato, corolle tubo obconico, lobis subrotundis patentibus, stamimum filamentis villosis. in Brasilis prov. Fluminensi. Caet. ign. B. triflora Pav.! herb. est Rubiacea quaedam." Hence, he treated *B. triflora* as a species of *Bignonia*, in the family Bignoniaceae, and attributed the species name to Vellozo. The phrases following the description can be broken into the following: 1. "in Brasilis prov. Fluminensi."—in the Brazilian province of Rio de Janeiro; 2. "Caet. ign."—

Otherwise unknown; and 3. "B. triflora Pav.! herb. est Rubiacea quadam"—B. triflora Pav.! in the herbarium, is a Rubiaceae. He did not mean that *B. triflora* Vell. was a rubiaceous species; he meant that he had seen, in the herbarium, a specimen of the family Rubiaceae which had been misidentified as this species. Nascimento et al. (2024) proposed to reject the name *Bignonia triflora* Vell. (Bignoniaceae), lectotypified the name, and maintained it in the Bignoniaceae. The Nomenclatural Committee has not yet reported a result for this proposal.

Bignonia triflora Pav. ex A. DC., Prodr. 9:148. 1845 (Rubiaceae), *nom. illeg. superfl.* Type: [icon.]: Drawing of *Bignonia triflora* by Francisco Xavier y Alcocer in the Archives of the Royal Botanical Expedition to the Viceroyalty of Peru, Acc. No. AJB04-D-0980_001 (neotype, **here designated**).

Notes.—Alphonse de Candolle (1845:148) cited this name as "B. [Bignonia] triflora (Vell. fl. flum. 6. t. 38), [*Bignonia triflora* Vell., Fl. Flumin.:249. 1829 ["1825"]; Fl. Flumin. Ic. 6:tab. 38. 1831 ["1827"]. […] In Brasiliae prov. Fluminensi. Caet. ign. B. triflora Pav.! herb. est Rubiaceam quaedam." Hence, *Bignonia triflora* Pav. ex DC. is a superfluous illegitimate name, because this binomial was previously published by Vellozo (1829:249). In the Royal Botanical Garden of Madrid, in the Archives of the Royal Botanical Expedition to the Viceroyalty of Peru made by Hipólito Ruiz & José Pavón, is present the original parchment of *Bignonia triflora* drawn by Francisco Xavier y Alcocer. At the bottom of the sheet there is the handwritten annotation "Xav.1° Cort. y Ale. del., 496, Bignonia triflora." On the plate is depicted a branch with several leaves, a flower in anthesis and a flower bud. At the bottom of the drawing are depicted a flower in anthesis in side view, a pistil with the calyx, a corolla longitudinally dissected, six stamens basally connate in short tube, hypanthium and calyx, a capsule, and a seed. Above the drawing is a label with the printed annotations "REAL JARDIN BOTANICO, CSIC—ARCHIVO, *Real Expedicion Botanica al Virreinado del Peru*, AJB04-D-0980_001." This plate is here designated as the neotype of *Bignonia triflora* Pav. ex DC. (Rubiaceae).

Coutarea scherffiana André, Ill. Hort. 25:120, tab. 321. 1878. Type: [Protologue: "In temperatis provinciae Pasto Neo-Granadensis" (COLOMBIA. Pasto)] [Icon.]: Table 321 of André, Illustration Horticole 25. 1878 (lectotype, **here designated**).

Notes.—Édouard François André (1878:120, tab. 321), in the protologue of *Coutarea scherffiana* André, cited his own collection as "In temperatis provinciae Pasto Neo-Granadensis legi, maio 1876.–E.A." and just below "Le *Coutarea scherffiana*, dont j'ai rapporté les graines, en 1876, de la province de Pasto (Nouvelle-Grenade), où il forme un bel arbrisseau à fleurs blanches dans la région temperée-chaude, est dedié à mon compagnon de voyage, M Fritz de Scherff." ["In the temperate province of Pasto (New Grenada) [Pasto Department, Colombia], from where I brought the seeds in 1876, where it forms a beautiful shrub with white flowers […], I dedicate it to my travel companion, Mr Fritz de Scherff."]. André brought with him the seeds from Colombia, introducing it into cultivation in the greenhouses of the *Jardin de Plantes*, in Paris. However, at the time of the description the plant had not bloomed yet. A search in numerous herbaria did not retrieve any original specimen associated with this name. André distinguished *C. scherffiana* from *C. speciosa* Aubl. [= *C. hexandra*] by its white corollas. In Table 321 it is depicted a branch with several leaf pairs and four large, white flowers in anthesis. This plate is here designated as the lectotype of *C. scherffiana*.

Coutarea hexandra var. γ *amazonica* K. Schum., in Martius et al., Fl. Bras. 6(6):197. 1889. Type: BRAZIL. Amazonas: Manaus, Ponte do Bilhares, 20 Jan 1955, *J. Chagas INPA Herb. No. 686* (neotype, **here designated:** U [U 0100301]; isoneotype: INPA [without barcode]).

Notes.—Schumann (1889:197) in the protologue of *Coutarea hexandra* var. γ *amazonica* K. Schum. cited the sole gathering *Poeppig 2920*. The original material in B was destroyed during WWII. After a general search in numerous herbaria I was unable to retrieve any specimen of *Poeppig 2920*, hence a neotype needs to be designated. The gathering *Chagas INPA Herb. No. 686* is present in at least two herbaria, and the specimen in U, barcode U 0100301, is here designated as the neotype.

Coutarea hexandra var. δ *fluminensis* K. Schum. Martius et al., Fl. Bras. 6(6):197, tab. 108. 1889. Type: BRAZIL. Bahia: "in sepibus et sylvis ad V. Pedra Branca," s.d., *C.F.P. Martius Obs. 1940* (lectotype, **here designated:** M [M-0187240]).

Notes.—Schumann (1889:197) in the protologue of *Coutarea hexandra* var. *fluminensis* K. Schum. cited numerous syntypes. One of them is cited as "ad Villa Branca: Obs. n. 1940." The original material in B was destroyed during WWII. A specimen in M, with barcode M-0187240, has a label with the annotation "Coutarea hexandra K. Sch. β Fluminensis" handwritten by Schumann, and the stamp "determ. C. Schumann." On the bottom left corner of the sheet is affixed a label with the annotations "Coutarea, Mart. Obs. 1940, in sepibus et sylvis ad V. Pedra Branca, [Prov.] Bahiensis, Nov." handwritten by Martius, and the printed annotation "Dr. Martius, Iter Brasil." The specimen consists of a branch with numerous leaves and a terminal inflorescence with flower buds and flowers in anthesis. This specimen is here designated as the lectotype of this varietal name.

Coutarea hexandra f. *tarapotensis* K. Schum., in Martius et al., Fl. Bras. 6(6):198. 1889. Type: PERU. Tarapoto, 1855–1856, *R. Spruce 4943* (first-step neotype (Delprete 1999b: 47), second-step neotype, **here designated:** NY [without barcode]; isoneotypes: BM [2 sheets, 000081663, 000081664], C [without barcode], MPU [MPU021296], TCD [TCD0005625]).

Notes.—Schumann (1889:198) in the protologue of *Coutarea hexandra* f. *tarapotensis* K. Schum., cited the material studied as "Habitat prope Tarapoto in Peruvia orientali: Spruce n. 4943', without citing the herbarium of deposit. The material studied by Schumann in B was destroyed during WWII. Delprete (1999b:47), cited the type of this name as "Type: Spruce 4943; Peru, Tarapoto (BM, NY)," which should be interpreted as a first-step neotype designation. The NY specimen, not annotated by Schumann, and still without barcode, is here designated as a second-step neotype.

Coutarea hexandra var. *calycina* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 4:92. 1904. Type: PARAGUAY: without locality, 1901–1902, *E. Hassler 8021a* (lectotype (Delprete 1999b:47): BM [barcode unknown]; isolectotypes: G [2 sheets, G00307393, G00307394]).

Coutarea hexandra f. *albiflora* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 4:92. 1904. TYPE: PARAGUAY: "Cordillerae centralis," 1900, *E. Hassler 6566* (LECTOTYPE (Delprete 1999b:47): BM [000081658, specimen "a"]; ISOLECTOTYPES: G [2 sheets, G00307410, G00307411].

Coutarea hexandra f. *grandiflora* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 4:92. 1904. TYPE: PARAGUAY: "Paraguaria septentrionalis," 1901–1902, *E. Hassler 7819* (LECTOTYPE (Delprete 1999b:47): BM [000081659, specimen "c"]; ISOLECTOTYPES: G [3 sheets, G00307387, G00307388, G00307389], MPU [MPU021294]).

Coutarea hexandra f. *roseiflora* Chodat & Hassl., Bull. Herb. Boissier, sér. 2, 4:92. 1904. TYPE: PARAGUAY: "Paraguaria centralis," 1901–1902, *E. Hassler 3497* (LECTOTYPE (Delprete 1999b:47): BM [000081658, specimen "d"]; ISOLECTOTYPES: C [without barcode], G [4 sheets, G00307378, G00307379, G00307380, G00307381]).

COUTAREA EXCLUDED TAXA

Coutarea andrei Standl., Publ. Field Mus., Bot. 7:202. 1931.
= *Coutareopsis andrei* (Standl.) Paudyal & Delprete (See below).

Coutarea campanilla DC., Prodr. 4:350. 1830. *Coutarea hexandra* var. *campanilla* (DC.) Steyerm., Mem. New York Bot. Gard. 23:298. 1972.
= *Coutaportla campanilla* (DC.) Delprete, comb. nov. (See above).

Coutarea coutaportloides C.M. Taylor, Novon 20:99. 2010.
= *Coutareopsis coutaportloides* (C.M. Taylor) Paudyal & Delprete (See below).

Coutarea fuchsioides C.M. Taylor, Novon 20:101. 2010.
= *Coutareopsis fuchsioides* (C.M. Taylor) Paudyal & Delprete (See below).

Coutarea lindeniana Baill., Adansonia 12:300. 1879.
= *Coutaportla campanilla* (DC.) Delprete, comb. nov. (See above).

Coutarea mexicana Zucc. & Martius ex DC., Prodr. 4:350. 1830.
= *Nernstia mexicana* (Zucc. & Martius ex DC.) Urb. (See below).

COUTAREOPSIS

Paudyal et al. (2018), as a result of their phylogenetic analysis using molecular data, retrieved *Coutarea andrei* Standl. and *C. fuchsioides* C.M.Taylor on a well-supported clade, distant from *C. hexandra*, and sister to a clade with *Exostema corymbosum*. *Coutarea coutaportloides* C.M. Taylor was not included in the phylogenetic study, and was maintained by those authors as a related species, due to overall morphological similarities. Following their phylogenetic analysis, Paudyal et al. (2018) transferred the three Andean shrubby *Coutarea* species to the genus *Coutareopsis*. They derived the generic name from *Coutarea* and "-opsis," which means "looking like *Coutarea*." The three species of *Coutareopsis* differ from *E. corymbosum* in having 1–3-flowered inflorescences on lateral short shoots (vs. terminal, multiflorous, corymbose in *E. corymbosum*).

Coutareopsis differs from *Coutarea* in having actinomorphic flowers (vs. zygomorphic), pink to red corollas (vs. white to pink to purple), anthers partly or completely included (vs. exserted), shrubs and small trees found in dry vegetation at high elevation on the Andes (vs. widespread throughout the Neotropics, from Mexico to Argentina, from sea level to to 500(–850) m altitude). *Coutareopsis* is a genus of three species of shrubs in dry forests and scrub vegetation, at (1800–)1900–2500 m on the Andes of Ecuador and Peru. Their occurrence in dry areas at higher elevations of the Andes, suggests a recent (ca. 10 Mya) evolutionary radiation corresponding with the Andean uplift.

Coutareopsis Paudyal & Delprete, Bot. J. Linn. Soc. 187:385. 2018; Standley, Publ. Field Mus., Bot. 7:202. 1931; Taylor & Lorence, Novon 20:95–105. 2010. TYPE: *Coutareopsis andrei* (Standl.) Paudyal & Delprete

1. Coutareopsis andrei (Standl.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:385. 2018. *Coutarea andrei* Standl., Publ. Field Mus., Bot. 7:202. 1931. TYPE: ECUADOR. LOJA: Chuquiribamba, 16 Nov 1876, *E. André 4443* (HOLOTYPE: F [No. 533792]; | ISOTYPES: K n.v., NY n.v., Y n.v.).

Distribution.—Ecuador (Loja) and northern Peru.

2. Coutareopsis coutaportloides (C.M. Taylor) Paudyal & Delprete, Bot. J. Linn. Soc. 187:386. 2018. *Coutarea coutaportloides* C.M. Taylor, Novon 20:99. 2010. TYPE: ECUADOR. AZUAY: Dirt road from Oña to Cochapata, km 20.3, 3°25′S, 79°6′W, 2500 m, 24 Oct 1997, *G.P. Lewis & P. Lozano 3650* (HOLOTYPE: QCNE [No. 675]; ISOTYPES: K [2 sheets, K000265576, K000843157], MO [No. 5564858]).

Distribution.—Ecuador (Azuay).

3. Coutareopsis fuchsioides (C.M. Taylor) Paudyal & Delprete, Bot. J. Linn. Soc. 187:386. 2018. *Coutarea fuchsioides* C.M. Taylor, Novon 20:101. 2010. TYPE: PERU. LA LIBERTAD: Prov. Pataz, rd. (Huamachuco to) Chagagual–Pataz, after Chagual on steep slope up the Cordillera, 7°48′S, 77°37′W, 1799 m, 21 Apr 2004, *M. Weigand & C. Schwarzer 7917* (HOLOTYPE: USM n.v.; ISOTYPES: BSB n.v., M [M-0210026], MO [No. 6145369]).

Distribution.—Peru (La Libertad).

CUBANOLA

Aiello (1979) transferred two species of *Portlandia*, one endemic to Cuba, and the other to Dominican Republic, to the newly founded *Cubanola*. She stated that "The name of the genus derives from the fact that one of the two species is endemic to Cuba and the other to Hispaniola." She distinguished *Cubanola* from *Portlandia* by its reticulate-foveate seeds (vs. tuberculate in *Portlandia*), non-persistent funicle (vs. persistent), loculicidal and septicidal capsule (vs. loculicidal), placenta circular in cross section (vs. linear and adnate to septum), and chartaceous to subcoriaceous leaves (vs. coriaceous). The separation of *Cubanola* as a distinct genus was supported by the molecular phylogenetic trees of Motley et al. (2005), Manns and Bremer (2010), and Paudyal et al. (2018).

Cubanola Aiello, J. Arnold Arbor. 60:111. 1979; Standley, N. Amer. Fl. 32(1):13. 1918; Liogier, Fl. Cuba 5:27. 1962; Liogier, Fl. Española 7:241, 243, f. 198–9. 1995; Borhidi, Rubiáceas Cuba 87, f. 22. 2017. TYPE: *Cubanola daphnoides* (R. Graham) Aiello

Gonianthes A. Rich., in Sagra, *nom. superfl.*, Hist. Cuba 11:10. 1850. TYPE: *Gonianthes sagrana* A. Rich. [= *Cubanola daphnoides* (R. Graham) Aiello]

Non *Gonianthes* Blume (1823) (Burmanniaceae).

1. Cubanola daphnoides (R. Graham) Aiello, J. Arnold Arbor. 60:112. 1979. *Portlandia daphnoides* R. Graham, Edinb. New Philos. J. 30:206. 1841. TYPE: CUBA. MATANZAS: Yumury River Valley, near Matanzas, 1849, *F.I.X. Rugel 374* (FIRST-STEP NEOTYPE (Aiello 1979: 112), **SECOND-STEP NEOTYPE, here designated:** NY [00126755]; ISONEOTYPES: BM [2 sheets, 000081662], GH [00058978], K [K000173488], L [2 sheets, L 0000272, L 0000273], NY [3 sheets, 00126752, 00126753, 00126754]).

Distribution.—Cuba (Guantánamo, Holguín, Villa Clara, Matanzas, Habana, Pinar del Rio).

Notes.—Graham (1841:206–207), in the protologue of *Portlandia daphnoides* R. Graham, wrote that the plant is native of Cuba, but did not cite any specimen or herbarium of deposit. Aiello (1979:112) cited the type of *P. daphnoides* as "NEOTYPE: Cuba, Matanzas, Yumury Valley, near Matanzas, *Rugel 374* (NY!)." There are four sheets of *Rugel 374* at NY. Aiello did not indicate which of those sheets is the neotype. Hence, Aiello's (1979:112) citation is a first-step neotypification. The NY sheet with barcode 00126755 has a label with the annotations "Cubanola daphnoides (R. Grah.) Aiello. NEOTYPE: Portlandia daphnoides R. Grah. Edinb. N. Phil. Journ. 30. 206. 1840. LECTOTYPE: Portlandia longiflora Meiss. ex Griseb. Pl. Cuba 126. 1866" typewritten by Aiello [underlines by Aiello]. According to the *Code* (Turland et al. 2018; e.g., Art. 30.1), an annotation affixed on a specimen does not count as effective publication. The NY specimen with barcode 00126755 is here designated as the second-step neotype of *P. daphnoides*.

Gonianthes sagrana A. Rich., in Sagra, Hist. Fís. Cuba, Bot. 11:10. 1850 (as "*sagreana*"). TYPE: CUBA: without locality [Havana], s.d., *Ramon de la Sagra s.n.* (FIRST-STEP LECTOTYPE (Aiello 1979:112), **SECOND-STEP LECTOTYPE,** here designated: P [P02273495]; ISOLECTOTYPES: P [2 sheets, P00582018, P02273496]).

Notes.—Achille Richard (in Sagra, 1850:10) in the protologue of *Gonianthes sagrana* A. Rich. (as "*sagreana*"), cited two gatherings as "Crescit in ruderatis circa *Havanam*, mense maio florens (*Ramon de la Sagra*), et prope Santiago (*Linden*)." Aiello (1979:112) cited the type of *G. sagrana* as "TYPE: Cuba, without further locality, Sagra s.n. (holotype, P!)." In P there are three sheets collected by de la Sagra, annotated with this name, hence Aiello's citation is a first-step lectotypification. The P specimen with barcode P02273495 has a label with the heading "Herbarium Richard" and the footnote "Legit Ramon de la Sagra," both handwritten in red ink, and "Gonianthes Sagraeana Nob." handwritten by Achille Richard in black ink. This specimen has another label with the typewritten annotation "Cubanola daphnoides (R. Grah.) Aiello. Holotype: Gonianthes sagraeana A. Rich. Annette Aiello 1977." The specimen consists of three branches, one with a pair of flower buds, one with a pair of flowers in anthesis, and a small branch with a pair of very young flower buds. This specimen is here designated as as the second-step lectotype of *G. sagrana*.

The P specimen with barcode P00582018 has a label the printed heading "HERBIER E. DRAKE" and the annotation "Cuba, Legit Ramon de la Sagra" handwritten by an unknown author. This specimen is an isolectotype.

The P specimen with barcode P02273496 has a label with the heading "Herbarium Richard" and the footnote "Legit Ramon de la Sagra," both handwritten in red ink, and "Gonianthes sagraeana Rich" handwritten in black ink by an unknown author (not Achille Richard). This specimen is an isolectotype.

Portlandia longiflora Meisner ex Griseb., Cat. Pl. Cub.:126. 1866. TYPE: CUBA. MATANZAS: Yumury River Valley, near Matanzas, 1849, *F.I.X. Rugel 374* (FIRST-STEP LECTOTYPE (Aiello 1979:112), **SECOND-STEP LECTOTYPE, here designated:** NY [00126755]; ISOLECTOTYPES: BM [2 sheets, 000081662], GH [00058978], K [K000173488], L [2 sheets, L 0000272, L 0000273], NY [3 sheets, 00126752, 00126753, 00126754]).

Notes.—Grisebach (1866:126) in the protologue of *Portlandia longiflora* Meisner ex Griseb., cited two gatherings as "Cuba occ., in praeruptis as Yumury pr. Matanzas (Rug. [Rugel] 374); Cuba or. et occ. (Wr. [Wright] 2678)." Aiello (1979:112) cited the type of *P. longiflora* as "TYPE: Cuba, Matanzas, Yumury Valley, near Matanzas, *Rugel 374* (lectotype, NY!)." As explained above (under *Gonianthes sagrana*), there are four sheets of *Rugel 374* at NY. Because Aiello did not indicate which of those sheets is the lectotype, her citation is a first-step lectotypification of *P. longiflora*. The NY specimen with barcode 00126755 is here designated as the second-step lectotype of this name.

2. Cubanola domingensis (Britton) Aiello, J. Arnold Arbor. 60:113. 1979. *Portlandia domingensis* Britton, Bull. Torrey Bot. Club 41:24. 1914. TYPE: DOMINICAN REPUBLIC. SAN PEDRO DE MACORÍS: San Pedro de Macorís, 26 Mar 1913, *J.N. Rose, W.R. Fitch & P.G. Russell 4176* (**LECTOTYPE, here designated:** NY [00126745]; ISOLECTOTYPES: GH [00058982], NY [00126744], US [00137325]).

Distribution.—Dominican Republic (La Altagracia, San Pedro de Macorís, La Romana).

Notes.—Britton (1914:24), in the protologue of *Portlandia domingensis* Britton, cited the material studied as "Near San Pedro de Macoris, Santo Domingo, March 26, 1913 (Rose, Fitch & Russell 4176)" without citing the herbarium of deposit. Aiello (1979:113) cited the type of *P. domingensis*, as "TYPE: Dominican Republic, […], *Rose et al. 4176* (holotype, NY! isotypes, GH!, NY!, US!)." As stated by Aiello, there are two specimens of *Rose et al. 4176* in NY. Because she did not specify which of the two NY specimens is the holotype, her citation cannot be treated as a lectotypification.

The NY sheet with barcode 00126745, has a label with the annotation "Portlandia dominguensis Britton, n.s." handwritten by Britton. It has a second label with the annotations "Cubanola dominguensis (Brit.) Aiello. Holotype: Portlandia dominguensis Britt. Bull. Torr. Bot. Club 41: 24 (1914)" typewritten by Aiello in 1977. The specimen consists of two branches with several undehisced capsules. This specimen is here designated as the lectotype of *Portlandia dominguensis*.

The NY sheet with barcode 00126744, has a label with the annotation "Portlandia dominguensis Britton" handwritten by Britton. The specimen consists of two branches with a few undehisced capsules. This specimen is an isolectotype.

EOSANTHE

Urban (1923a:162–163) described *Eosanthe* Urb., as a genus belonging to the Rubiaceae, but did not position it in any tribe. He derived the generic name from the Greek, Eos (Ἠώς), the Greek goddess of the dawn, and anthes (female form of anthos, ἄνθος), flower, referring to the orange calyx lobes of this genus. Robbrecht (1988, 1994) treated it as a genus *incertae sedis*. Delprete (1999a), based on morphological observations, indicated that *Eosanthe* is similar to *Phialanthus* because of the sheathing stipules, axillary inflorescence, persistent four-lobed calyx, filaments not connate to the corolla tube. Delprete (1999a:220) also wrote "*Eosanthe* resembles some species of *Schmidtottia* (Catesbaeeae sensu Delprete 1996) in having sheathing stipules, ovate coriaceous leaves, resinous branches, foliose calyx lobes, and linear-oblong anthers. The species of *Schmidtottia* with sheathing stipules and ovate thick-coriaceous leaves that resemble those of *Eosanthe* are *S. sessilifolia* (Britton) Urb. and *S. elliptica* (Britton) Urb. *Schmidtottia* differs from *Eosanthe* in having terminal few-flowered inflorescences (vs. solitary axillary flowers) and many-seeded capsules (vs. two-seeded pseudosamaras). […] *Eosanthe* is tentatively included in the Catesbaeeae-Chiococceae complex." Manns and Bremer (2010), following their molecular phylogenies, included *Eosanthe* in the Chiococceae. The molecular phylogenies of Paudyal et al. (2018) are in agreement with Delprete's morphological observations, and Manns and Bremer's (2010) molecular phylogenies, and confirmed its position within the Chiococceae. *Eosanthe* is an extremely rare, monotypic genus, endemic to eastern Cuba (Sierra de Cristal, 1200–1300 m), with foliaceous, bright

orange-red calyx lobes, yellow corolla, and fruits that are narrowly winged pseudo-samaras (due to the persistent calyx lobes), which is a unique fruit type in the tribe. A full description of genus and species is available in Delprete (1999a).

Eosanthe Urb., Symb. Antill. 9:162. 1923; Delprete, Brittonia 51:217–230. 1999; Standley, N. Amer. Fl. 32(4):298. 1934; Liogier, Fl. Cuba 5:98. 1962; Borhidi, Rubiáceas Cuba 97–98. 2017. TYPE: *Eosanthe cubensis* Urb.

1. Eosanthe cubensis Urb., Symb. Antill. 9:162. 1923. TYPE: CUBA. HOLGUÍN: Sierra del Cristal, prope acumen, 1200–1300 m, 8 Mar 1916, *E.L. Ekman 6816* (LECTOTYPE (Delprete 1999a:229): S [No. S-R-7947]).

Distribution.—Cuba (Holguín: Sierra del Cristal).

Notes.—Urban (1923a:162–163), in the protologue of *Eosanthe cubensis* Urb., cited the gathering *Ekman 6816*, without indicating the herbarium of deposit. The original material at B studied by Urban was destroyed during WWII. Delprete (1999a:229) designated the lectotype of this name as "Type. CUBA. Holguin: Sierra del Cristal, […], Ekman 6816 (HOLOTYPE: B-destroyed; LECTOTYPE, here selected: S)." In S there is a specimen of *Ekman 6816*, with accession number S-R-7947, that has a label with the annotation "Eosanthe cubensis Urb (gen. nov., spec. nov.)" handwritten by Urban. The specimen consists of two branches with several coriaceous leaves, and two separate branch tips, with terminal inflorescences, and conspicuous, orange calyx lobes. This is the specimen that was designated by Delprete (1999a:229) as the lectotype of *E. cubensis*.

Eosanthe cubensis is an extremely rare species. To my knowledge, aside from the type gathering, it is know only by one additional collection from the same locality: CUBA. Sierra del Cristal, 1100–1325 m, 15 Dec 1922 (young fr), *E.L. Ekman 15990* (HAC [2 sheets]).

ERITHALIS

Patrick Browne (1756:165, t. 17, fig. 3) described and illustrated the genus *Erithalis* P. Browne, in *The Civil and Natural History of Jamaica*, without citing a species. The generic name is derived from the Greek "erithales" (ἐριθαλές), which means "herb that grows on walls." Linnaeus (1759:930) published the species *Erithalis fruticosa* L., citing Browne's description and illustration. The molecular phylogenies of Negron-Ortiz and Watson (2002, 2003), Motley et al. (2005), and Manns and Bremer (2010) proved that this genus belongs to the Chiococceae. Paudyal et al.'s (2018) molecular phylogenies confirmed its position in the tribe, and resolved *Erithalis* as monophyletic, corroborating previous results. *Erithalis* is characterized by being shrubs or small trees, with interpetiolar stipules, connate at base, inflorescences axillary, paniculate, corymbose, racemose, or uniflorous, corollas actinomorphic, hypocrateriform, narrowly infundibular or rotate, stamens inserted at the base of corolla tube, style branches 2 or 5–8, ovaries with 2–5 locules, 5–20-celled, and drupaceous fruit with woody pirenes. The genus was revised by Negrón-Ortiz (2005), and her species delimitations are here adopted, except for *E. insularis* (Ridl.) D. Zappi & T.S. Nunes, which is here recognized as a distinct species. Another species, *E. orbiculata* (Proctor) A.R. Franck, P.A. Lewis & Oberli, from Jamaica, was recently transferred to this genus (Franck et al. 2017). *Erithalis*, as here delimited, is a genus of 10 species, exceptional in the Chiococceae by having 5–20-celled drupes, widespread in the Caribbean region (including Caribbean coast of Venezuela), and one species endemic to Fernando de Noronha Island (northeastern Brazil).

Erithalis P. Browne, Civ. Nat. Hist. Jamaica 165, t. 17, fig. 3. 1756; Standley, North Amer. Flora 32(4):279–281. 1934; Liogier, Fl. Cuba 5:89–90. 1962; Correll & Correll, Fl. Bahama Arch. 1386–1388, f. 605. 1982; Liogier, Fl. Española 7:250, 252–253, f. 198–213. 1995; Negron-Ortiz & Watson, Pl. Syst. Evol. 234:71–83. 2002; Negron-Ortiz & Watson, Syst. Bot. 28(2):442–451. 2003; Negrón-Ortiz, Sida 21:1565–1598. 2005; Lorence, Fl. Mesoamericana 4.2:85–86. 2012; Borhidi et al., Rubiáceas Cuba 98–102, f. 26. 2017. TYPE: *Erithalis fruticosa* L.

1. Erithalis angustifolia DC., Prodr. 4:465. 1830. TYPE: [LESSER ANTILLES (See notes below)]: *Collector unknown s.n.* (HOLOTYPE: G-DC [G00666855]).

Distribution.—Lesser Antilles (Martinique, St. Vincent and the Granadines), and Trinidad.

Notes.—In G-DC there is a sheet, with barcode G00666855, which has the annotation "Erithalis angustifolia DC." handwritten by Candolle. The specimen consists of a small branch with numerous leaves, flowers

in anthesis, and mature fruits. At the base of the branch is pinned a label with the annotations "Rubiaceae. La Havane. Mr de la Ossa 1825" handwritten by an unknown author. The latter annotation is incorrect, as this species only occurs in the Lesser Antilles and Trinidad. This specimen is the holotype of this name.

Erithalis acuminata Krug & Urb., Notizbl. Bot. Gart. Berlin-Dahlem 1:319. 1897. Type: MARTINIQUE: Guilding, 1877, *P. Duss 206* (lectotype (Negrón-Ortiz 2005:1582): NY [00743699]).

Notes.—Krug and Urban (1897:319), in the protologue of *Erithalis acuminata* Krug & Urb., cited the material studied as "Habitat in Martinique, solummodo in Montagne-Pelée 900–1000 m alt., sed ibidem satis frequens: Duss n. 206, 937, 1724; St. Vincent: Guilding."

Negrón-Ortiz (2005:1582), for *Erithalis acuminata*, cited the type as "Martinique, Guilding, 1877, *Duss 206* (holotype: B, destroyed; Lectotype: NY!, here designated)." In NY there is a sheet of *Duss 206*, with barcode 00743699, which has a label with the printed annotations "Lectotype. Erithalis acuminata Kr. and Urb. Notizbl. Königl. Bot. Gart. Berlin. 1:319–320. 1897 […] Det.: V. Negrón-Ortiz in 2004." The specimen consists of a small branch with numerous leaves, and several infructescences with mature fruits. This is specimen that was designated as the lectotype of *E. acuminata* by Negrón-Ortiz.

In NY there is another specimen, with barcode 00115111, which has a label with the annotation "No. 206, 937, 1724, Erythalis angustifolia Griseb. (non DC), " acuminata Kr. et Urb. n. sp. […] Montagne Pelée/versant du fond Coré, […] 900–1000, 1877, 1879, 1883." It is apparent that the annotations on this label simply reproduced the information of the material cited Krug and Urban (1897:319). Hence, this specimen is dubious original material.

Chiococca pulcherrima Wernham, J. Bot. 51:322. 1913. Type: ST. VINCENT: without locality, s.d., *Anderson 308* (holotype: BM [000551620]; isotype: K n.v.).

2. Erithalis diffusa Correll, J. Arnold Arbor. 58:47. 1977. Type: BAHAMAS: San Salvador, N of airstrip and Teachers College, near Riding Rock, 21 Nov 1974, *D.S. Correll 43840* (holotype: A [00092883]; isotypes: F [No. 1784095], FTG n.v., NY [00115113]).

Distribution.—Bahamas (San Salvador and Crooked Islands).

3. Erithalis fruticosa L., Syst. Nat., Ed. 10, 2:930. 1759. Type: [icon.]: Tab. 17, Fig. 3 in P. Browne, Civ. Nat. Hist. Jamaica, vol. 1. 1756 (**lectotype, here designated**).

Distribution.—Southern USA (Florida), Bahamas, Greater and Lesser Antilles, Trinidad, Mexico (Veracruz, Campeche, Quintana Roo), Venezuela (Caribbean coast and Caribbean Islands), Colombia (Santa Catalina Island, Caribbean region).

Notes.—Jarvis (2007:504) regarding the type of *Erithalis fruticosa* L., wrote "Negrón-Ortiz (in Sida 21:1584) wrongly refers to the cited Browne plate as the holotype (there is no original material in S). Although this could be corrected to lectotype under Art. 9.8, the absence of "designated here" with the type statement (Art. 7.11) means that this cannot be accepted as a formal typification (See Art. 9.8, Note 4)." Following Jarvis's observations, Tab. 17, Fig. 3 of P. Browne's *Civil and Natural History of Jamaica* (1756), is here designated as the lectotype of this name.

Erithalis odorata Pers., Syn. Pl. 1:200. 1805, *nom. alt.*

Erithalis inodora Jacq., Select. Stirp. Amer. Hist.:73. 1763. *Erithalis fruticosa var. inodora* (Jacq.) Persoon, Syn. Pl. 1:200. 1805. Type: LEEWARD ISLANDS. Dominica: Forest bluff into sea near Anse Du Me on the northern coast, ca. 7 mi E of Portsmouth, 11 Aug 1964, *R.L. Wilbur, E.L. Dunn, H.A. Hespenheide & D.R. Wiseman 8304A* (**neotype, here designated:** MO [No. 4626927, barcode MO-1432073]).

Notes.—Jacquin (1763:73), in the protologue of *Erithalis inodora* Jacq., cited the material studied as "Habitat passim in Curação" without citing the herbarium of deposit. As already reported by Negrón-Ortiz (2005:1585), I was also unable to locate any original specimen. Therefore, a neotype needs to be designated. The specimen *Wilbur et al. 8304A* in MO, with accession number 4626927 (barcode MO-1432073), is here designated as the neotype of *E. inodora*.

Erithalis elliptica Raf., Sylva Tell. 123. 1838. Type: Based on Swartz's description of *E. fruticosa*.

Erithalis parviflora Griseb., Cat. Pl. Cub. 134. 1866. Type: CUBA: without locality, 1860–1864, *Wright 2721* (holotype: GOET [GOET010231]; isotypes: K [K000173942], MO [No. 2092104], NY [00743698], S [No. S05-983], US [00138504], YU [YU.065584]).

Erithalis harrisii var. *angusta* S. Moore ex Rendle, J. Bot. 73:279. 1935. Type: JAMAICA: Luana Point, collection date unknown, *Harris 9821* (holotype: BM n.v.).

Erithalis revoluta Urb., Symb. Antill. 3:379. 1903. Type: PUERTO RICO: Guânica, Caño Gordo, s.d. [13 Feb 1886], *P. Sintenis 3796* (**lectotype, here designated:** F [No. 189202]).

Notes.—Urban (1903:379) in the protologue of *Erithalis revoluta* Urb., cited the material studied as "Portorico in sylvis litoralibus ad Caño Gordo, m. Febr. de flor.: Sintenis n. 3796." The original material at B studied by Urban was destroyed during WWII. There is a specimen in F, accession number 189202, which has a label with the heading "P. SINTENIS: PLANTAE PORTORICENSES," the annotations "3796. Erithalis revoluta Urb. (typus). Prope Guanica in sylvis litoralibus ad Caño Gordo, 13.II. 1886," and the

watermark "Herb. Krug et Urban." At the bottom of the label is printed "det. I. Urban." This specimen is here designated as the lectotype of *E. revoluta*.

4. Erithalis harrisii Urb., Symb. Antill. 5:514. 1908. TYPE: JAMAICA: near Troy, 30 Jun 1904, *W.H. Harris 8743* (LECTOTYPE (Lebrón-Ortiz 2005:1588): NY [00115115]; ISOLECTOTYPES: E [E00285119], NY [00115114], US [00138503]).

***Distribution.*—**Jamaica.

5. Erithalis insularis (Ridl.) D. Zappi & T.S. Nunes, Kew Bull., 55(3):655. 2000. *Palicourea insularis* Ridl., J. Linn. Soc. 27:41. 1890. *Chiococca insularis* (Ridl.) C.M. Taylor & M.R.V. Barbosa, Phytotaxa 202:18. 2015. TYPE: BRAZIL. PERNAMBUCO: Island of Fernando de Noronha, 26 Aug 1887, *H.N. Ridley, T.S. Lea & G.A. Ramage 86* (HOLOTYPE: BM [BM000949953]; ISOTYPES: GH [00094899], K [2 sheets, K000016495, K000016496]).

***Distribution.*—**Brazil, Island of San Fernado de Noronha.

***Notes.*—**Ridley (1890:41), in the protologue of *Palicourea insularis* Ridl., cited the material studied as "Main Island, in the Sapate woods, only a few bushes at one spot," without citing the herbarium of deposit. Most importantly, he described the fruit as "Drupa viridis, 5-angulata, 5-loculis." Stafleu and Cowan (1983:786) regarding Ridley's collections specified that his gatherings from Fernando de Noronha are in BM. Negrón-Ortiz (2005:1585) regarding the type of *P. insularis*, wrote "Type: BRAZIL. Pernambuco: Fernando de Noronha Island, 1887, *Ridley, Lea & Ramage 86* (holotype BM-n.v., not at BM per BM staff); lectotype: K! here designated; isotype B-destroyed, photo NY!)." The holotype specimen was later found at BM, barcode BM000949953, as reported by Figueira et al. (2020).

The generic position of this species has a complex history. Rydley (1890) initially described it as a species of *Palicourea*. Zappi and Nunes (2000) transferred it to *Erithalis*, proposing the new combination *E. insularis* (Ridl.) D. Zappi & T.S. Nunes, and stated that it "differs from all other species of the genus by its poorly branched, few-flowered inflorescences, which remain hidden by the surrounding leaves. The leaves are distributed along the new branches, while most *Erithalis* tend to have leaves grouped distally on the branches, resembling species of *Terminalia* (Combretaceae)." The characters used by those authors to transfer this species to *Erithalis* are not really distinctive from other species of the genus, for example, in many *Erithalis* species the leaves are distributed along the branches, e.g., *E. harrisii*, *E. angustifolia*. Also, the type specimens (*Ridley et al. 86*) show that the inflorescences vary in length and architecture, as they are short and few-flowered in the GH and K specimens, and paniculate, many-flowered, and almost as long as the leaves in the BM holotype.

Negrón-Ortiz (2005:1585) treated *Erithalis insularis* as a synonym of *E. fruticosa*, with no further comment, showing that the specialist who revised the genus opted to include this species in *Erithalis*.

Taylor and Barbosa (in Jardim et al. 2015:18) transferred this species to *Chiococca*, with the new combination *C. insularis* (Ridl.) C.M. Taylor & M.R.V. Barbosa. Those authors stated that *Palicourea insularis* was originally described by Ridley (1890) as a shrub or small tree, with five-merous corollas with apparently valvate aestivation, and fruits with four pyrenes. However, Ridley (1890:41) described the fruits of this species as 5-locular. Taylor and Barbosa continued their discussion by stating that "However several of its characters do not agree with *Palicourea* (Palicoureeae), in particular its apparent lack of raphides, triangular stipules, axillary inflorescences, quincuncial corolla aestivation, and fusiform stigmas that are positioned together with the anthers in open flower; *Palicourea* is characterized by raphides in the tissues, bilobed stipules, terminal inflorescences, valvate corolla aestivation, and bifid stigmas that are positioned above or below the anthers in the open flowers." They complemented those statements with a detailed comparison between *Erithalis* and *Chiococca*, and concluded that this species is better positioned in *Chiococca*.

Figueira et al. (2020) presented a long discussion on the ecology and conservation of *Chiococca insularis*, mostly stimulated by the fact that this rare species, previously thought to be extinct, was rediscovered in Fernando de Noronha. They also added a plate illustrating the features of this species. The characters shown in figure 3 of Figueira et al. (2020), in my opinion, provide significant evidence that this species should be maintained in *Erithalis*. In figure 3E is shown an ovary in cross section, with 4 locules and one ovule each, while most species of *Chiococca* have 2-locular ovaries, which commonly develop into 2-seeded fruits, or in some species 1-seeded fruits by abortion of one ovule (e.g , *C. nitida*). In *C. alba*, the ovaries are 2-locular, developing into 2-seeded fruits. In some rare populations of *C. alba*, the ovaries have been reported to be

exceptionally 3-locular (Müller Argoviensis, 1881; Robinson, 1902). In figure 3F is shown a paniculate inflorescence, similar to those of several species of *Erithalis*, e.g., *E. harrisii* and *E. angustifolia*. In figure 3F are also shown several flowers in anthesis, with deeply divided corollas and narrowly oblong lobes, as in most species of *Erithalis*. Finally, in figure 3G are shown smooth, black fruits, which are also typical of many *Erithalis* species, while the fruits of most species of *Chiococca* are commonly white. In conclusion, this taxon should be treated as a distinct, extremely rare species of *Erithalis*, endemic to the Fernando de Noronha Island.

6. Erithalis odorifera Jacq., Sel. Stirp. Amer. 72. 1763. *Erithalis odorata* Raf., Sylva Tell. 123. 1838 (intended to replace *E. fruticosa* in the sense of Jacquin and Plumier; no publication cited). *Erithalis fruticosa* var. *odorifera* (Jacq.) Griseb., Fl. Brit. W. I. 336. 1861. *Erithalis fruticosa* ssp. *odorifera* (Jacq.) Steyerm., Fl. Venez. 9:869. 1974. TYPE: [Icon.]: Plumier, Icon 249, f. 2. (LECTOTYPE (Lebrón-Ortiz 2005:1589)).

Distribution.—Bahamas, Greater and Lesser Antilles, and Caribbean coast of Venezuela.

Erithalis rotundata Griseb., Pl. Wright. 2:507. 1862. TYPE: CUBA. HOLGUÍN: Monte Verde, Jan–Jul 1859, *C. Wright 1268* (LECTOTYPE (Lebrón-Ortiz 2005:1589): GOET [GOET008938]; ISOLECTOTYPES: GH [2 sheets, 00092684, 00092685], MO [2 sheets, Nos. 2092105, 2092106], NY [00743697], PH [00012880 ("Sep 1859–Jan 1860")], S [No. S05-988], YU [2 sheets, YU.065585, YU.065586]).

7. Erithalis orbiculata (Proctor) A.R. Franck, P.A. Lewis & Oberli, Phytotaxa 297(3):278. 2017. *Exostema orbiculatum* Proctor, J. Arnold Arbor. 63:303. 1982. TYPE: JAMAICA: Trelawny, Crown Lands area, ca. 5 mi NW of Troy, 1750–2000 ft. [530–610 m], 10 Jun 1975, *G. Proctor 35236* (HOLOTYPE: IJ [No. 61431]; ISOTYPES: A [00046005], US [00130605]).

Distribution.—Jamaica.

8. Erithalis quadrangularis Krug & Urb., Notizbl. Bot. Gart. Berlin-Dahlem 1:320. 1897. TYPE: JAMAICA: New Green, near Manchester, 29 Apr 1896, *W.H. Harris 6318* (LECTOTYPE (Lebrón-Ortiz 2005:1591): NY [000115116]).

Distribution.—Jamaica, St. Vincent and the Granadines.

Notes.—Krug and Urban (1897:320), in the protologue of *Erithalis quadrangularis* Krug & Urb., cited the material studied as "Habitat in Jamaica in New Green 700 m alt., m. April. florif.: Bot. Dep. Herb. (W. Harris) n. 6318." The original material at B studied by Krug and Urban was destroyed during WWII. Lebrón-Ortiz (2005:1591) designated specimen *Harris 6318* in NY as the lectotype.

9. Erithalis salmeoides Correll, J. Arnold Arbor. 58:49, fig. 8. 1977. TYPE: BAHAMAS: Great Inagua, between Conch Shell Point and Lantern Head, 3 Aug 1975, *D.S. Correll 45897* (HOLOTYPE: A [00092686]; ISOTYPE: FTG n.v.).

Distribution.—Bahamas (Great Inagua, Little Inagua, Mayaguana), Turks and Caicos, Jamaica, and Cuba (Santiago de Cuba).

10. Erithalis vacciniifolia (Griseb.) Wright, Anal. Acad. Ci. Habana 6:126. 1869. *Chione vacciniifolia* Griseb., Cat. Pl. Cub. 133. 1866. *Erithalis fruticosa* ssp. *vaccinifolia* (Griseb.) Borhidi, Bot. Közlem. 58:177. 1971. TYPE: CUBA. Baracoa, 1860–1864, *C. Wright 2719* (HOLOTYPE: GOET n.v.; ISOTYPES: GH [00092520], K [K000173941]).

Distribution.—Cuba and Dominican Republic.

EXOSTEMA

Bonpland (in Humboldt et Bonpland, Pl. Aequin. 1:131. Apr 1807 ["1808"]) published the genus *Exostema* (Pers.) Bonpl. by raising *Cinchona* subg. *Exostema* Pers. to genus rank, hence, the type of *Exostema* is the type of *C.* subg. *Exostema*, *C. caribaea* Jacq. [= *Exostema caribaeum* (Jacq.) Schult.]. Bonpland derived the genus name by referring to the exserted stamens of the genus. The taxonomic relationships among *Coutarea*, *Hintonia* and *Exostema* have been variously interpreted by different authors. For example, Hooker (1873a), Schumann (1891), and Robbrecht (1988), placed *Coutarea* and *Exostema* in Cinchoneae, because of their capsular fruits and winged seeds. McDowell (1995, 1996) delimited *Exostema*, by having terminal inflorescences and corolla tubes 13–21 cm long (e.g., *E. longiflorum* Roem. & Schult.) or axillary inflorescences and corolla tubes 1–4 cm long (e.g., *E. nitens* Urb.). Delprete (1996), with a phylogenetic analysis of the Catesbaeeae-Chiococceae-*Exostema* complex using morphological data, retrieved three clades, which he called Catesbaeeae (*Portlandia*-group, *Catesbaea*-group), *Exostema*-group, and Chiococceae. *Exostema*, as traditionally delimited (e.g., McDowell, 1995, 1996), is a highly polymorphic taxon, which was later shown to be paraphyletic, and

this reflected on the difficulties in coding the polymorphic morphological characters used in the phylogenetic analysis by Delprete (1996). McDowell (1996) and McDowell and Bremer (1998) retrieved *Exostema sensu* McDowell (1996) as monophyletic; however, this result is misleading because in their analysis they did not include any additional ingroup genera, and they used *Coutarea hexandra* as the only outgroup, which is closely related to the South American species of *Exostema sensu* McDowell (McDowell et al. 2003; Motley et al. 2005; Paudyal et al. 2018). Paudyal et al.'s (2018) molecular phylogenetic analysis reiterated that *Exostema*, as traditionally circumscribed, is not monophyletic, corroborating most of the previous molecular phylogenetic studies (McDowell et al. 2003; Motley et al. 2005; Robbrecht & Manen 2006; Bremer & Eriksson 2009; Manns & Bremer 2010; Manns et al. 2012). Paudyal et al.'s (2018) subclade B1 comprised only the eight *Exostema* species with axillary inflorescences. Their results agreed with the morphology-based delimitation of *Exostema* section *Exostema* of McDowell (1996). Accordingly, Paudyal et al. (2018) restricted the delimitation of *Exostema* by including only the species with axillary inflorescences, which are distributed in Cuba and Hispaniola, and *E. caribaeum*, which is also present in other Antilles, Mexico, and Central America.

Exostema sensu Paudyal et al. (2018) is a genus of eight species of shrubs or small trees 1–6(–10) m tall, with axillary inflorescences, 4–5-merous flowers, fragrant during the day, actinomorphic corollas, stamens exserted or partially exserted, style clavate or subcapitate, capsules obovate in outline, slightly laterally compressed, and seed basipetally, acropetally or centrally inserted.

Exostema (Pers.) Bonpl. in Humboldt et Bonpland, Pl. Aequin. 1:131. Apr 1807 ["1808"]. *Cinchona* subg. *Exostema* Pers., Syn. Pl. 1:196. 1 Apr–15 Jun 1805; W. Wright, Phil. Trans. 62(2):504–506, f. 10. 1778; Standley, N. Amer. Fl. 32(2):117–126. 1921; Liogier, Fl. Cuba 5:20–25, f. 2. 1962; Correll & Correll, Fl. Bahama Arch. 1394, f. 607. 1982; Borhidi & Fernández Zequeira, Acta Bot. Hung. 35(1–4):287–307. 1989; Liogier, Fl. Española 7:254, 256–265, f. 198–15. 1995; McDowell. Monogr. *Exostema* (Rubiaceae), Ph.D. Thesis, Duke University, 1995; McDowell, Opera Bot. Belg. 7:277–295. 1996; McDowell & Bremer, Pl. Syst. Evol. 212:215–246. 1998; Darók et al., Acta Bot. Hung. 42(1–2):85–96. 2000; McDowell et al., Syst. Bot. 28:431–441. 2003; Lorence, Fl. Mesoamericana 4.2:86–87. 2012; Borhidi et al., Rubiáceas Cuba 103–119, f. 27–28. 2017; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018; Borhidi et al., Acta Bot. Hung. 60(3–4):302–311. 2018; Greuter & Rankin-Rodríguez, Taxon 70:906. 2021; Greuter & Rankin-Rodríguez, Taxon 71:210–215. 2022; Delprete & Paudyal, Taxon 72(5):1098–1108. 2023. LECTOTYPE (Rogers 1987:165): *Exostema caribaeum* (Jacq.) Schult.

1. Exostema acuminatum Urb., Symb. Antill. 3:378. 1903. TYPE: DOMINICAN REPUBLIC. SANTO DOMINGO: Santo Domingo, near the city, s.d., *Rob. H. Schomburgk 42* (**NEOTYPE, here designated:** K [K000173622]).

Distribution.—Haiti and Dominican Republic.

Notes.—Urban (1903:378–379) in the protologue of *Exostema acuminatum* Urb., cited the following gatherings: *Buch 753* from Haiti; *Rob. Schomburgk 42*, *Rob. Schomburgk 85*, and *Eggers 1798* from Dominican Republic; without citing the herbarium of deposit. The original material at B studied by Urban was destroyed during WWII. Three corresponding specimens are present in separate herbaria: *Schomburgk 42* in K, *Schomburgk 85* in F, and *Buch 753* in GH. None of those specimens shows proof that they were examined by Urban. The K specimen of *Schomburgk 42*, barcode K000173622, has a label with the annotation "No. 42" followed by a detailed description handwritten by Robert Schomburgk. On the sheet are affixed two branches with numerous leaves and numerous flowers in anthesis. This specimen is here designated as the neotype of *E. acuminatum*.

2. Exostema caribaeum (Jacq.) Schult. in Roem. & Schult., Syst. Veg., ed . 15[bis], 5:19. 1819. *Cinchona caribaea* Jacq., Enum. Pl. Carib. 16. 1760. TYPE: DOMINICA: Prince Rupert Head, 8 Jun 1792, *J. Findlay s.n.* (NEOTYPE (McDowell 1996:283, 289): BM [000028058]).

Distribution.—USA (southern Florida), Bahamas, Greater and Lesser Antilles, Mexico, Guatemala, Honduras, Costa Rica, Panama.

Notes.—Jacquin (1760:16) published *Cinchona caribaea* Jacq. with the succinct description "pedunculis unifloris" without citing any specimen. Three years later, Jacquin (1763:61–62, tab. 179, fig. 95) published a detailed description of *C. caribaea*, followed by a statement regarding the collection localities and phenology, "Habitat in fruticetis circa Havanam; & in Domingo ad finum Bayaha. Floret Septembri & Octobri. Fructus maturos collegi Decembri." In Jacquin's table 179, figure 95 is depicted a dehisced capsule and one half of a

dehisced capsule, which could belong to a number of Rubiaceae genera. This figure is not original material, and does not represent reliable material for the application of this name. Article 9.4 of the *Code* (Turland et al. 2018) states, in part, "For the purposes of this *Code,* original material comprises the following elements: (a) those specimens and illustrations (both unpublished and published prior to publication of the protologue) that the author associated with the taxon, and that were available to the author prior to, or at the time of, preparation of the description, diagnosis, or illustration with analysis (Art. 38.7 and 38.8) validating the name; […]."

Howard (1973), regarding the material gathered by Jacquin in the Caribbean Region, stated, "The consignments of living plants had been considerable; herbarium material was scanty, but many drawings and descriptions had been made on the spot." According to Art. 9.4 (Turland et al. 2018), if Jacquin's original drawing of *Cinchona caribaea* still exists, it would be original material. In the Botany Library of the Natural History Museum of London, is preserved a volume with Jacquin's original notes and drawings, with the description "Von Jacquin botanical notes. 18th-century botanical drawings and notes made by French scientist and botanist Nicolaus Joseph von Jacquin (1727–1817)." Rosie Jones, Special Collection Librarian of the Natural History Museum, carefully searched the volume for a possible drawing of *Cinchona caribaea*, and confirmed that no such drawing is present in the volume.

McDowell (1996) searched BM and LINN and did not find any original specimen of *Cinchona caribaea*. A recent search in the W virtual herbarium (https://jacq.org) also did not find any original specimen. McDowell's (1996:283, 289) type citation of *C. caribaea* is somewhat confusing. On page 283, he designated a specimen of *De Ponthieu s.n.* in BM, collected in Dominica in 1792, as the neotype, and on page 289, he designated it as the lectotype. In BM there is a specimen of *De Ponthieu s.n.*, barcode 000028156, which McDowell identified in 1994 as *Exostema sanctae-luciae* (Kentish) Britten. Since McDowell identified the *De Ponthieu s.n.* specimen as *E. sanctae-luicae*, it cannot be the neotype of *E. caribaeum* (Jacq.) Schult. Hence, McDowell cited the wrong specimen as neotype. According to article 9 of the *Code* (Turland et al. 2018), errors of a type citation can be corrected. In BM there is a specimen, barcode 000028058, which was collected by Captain Findlay on Prince Rupert Head in Dominica, on 8 June 1792. Hence, specimen 000028058 is assumed to be the one that McDowell really meant to cite in his typification of *C. caribaea*.

Cinchona jamaicensis W. Wright, Philos. Trans. 67:506, f. 10. 1778, *nom. superfl.* of *Cinchona caribaea*.

Cinchona myrtifolia Stokes, Bot. Mat. Med. 1:359. 1812. Type: Not traced.

Notes.—Jonathan Stokes (1812:359), in the protologue of *Cinchona myrtifolia* Stokes, cited the material studied as "*Obs.* 6211. Specimen gathered by Broughton in Jamaica."

Cinchona racemosa Schrank ex Steud., Nom. Bot. ed. 2, 1:363. 1840, *nom. illeg. superfl.*

Notes.—*Exostema caribaeum* (as "*Exostemma*") is cited in synonymy under this name, which corresponds to *Cinchona caribaea* Jacq., a valid name cited on the same page.

Exostema longicuspe Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1852:48. 1853. Type: COSTA RICA: Puntarenas, Island of San Lucas, s.d., *A.S. Oersted 11403* (**lectotype, here designated:** C [C10018137]; isolectotypes: C [C10018138], K n.v.).

Notes.—Oersted (1853:48) in the protologue of *Exostema longicuspe* Oerst., cited his own collection as "Paa den lille Ö San Lucas ved af Costa-Rica i Naerheden af Puntarenas." There are two specimens in C associated with this name and collected by Ørsted, both of them with the collection number *11403* and the handwritten annotation "Exostemma longicuspis Örst. In insula San Lucas." Specimen with barcode C10018137 is here designated as the lectotype of *E. longicuspe*.

Exostema caribaeum var. *velutinum* Urb., Symb. Antill. 8:665. 1921. Type: HAITI: Plaine in hills, s.d., *C.G. Ehrenberg 339* (not traced).

Exostema caribaeum var. *pubescens* Borhidi & Muñiz, Acta Bot. Acad. Sci. Hung. 18:48. 1973. Type: CUBA. Santiago de Cuba: near Versailles, s.d., *A. Borhidi, Muñiz & S. Vazquez s.n.* (holotype: BP n.v.).

Exostema veraensis Kitanov, Fitologiya 11:51. 1979. Type: CUBA. Santiago de Cuba: Between Santiago de Cuba airport and Punta Gorda, in shrubs on limestone, s.d., *B.P. Kitanov SV No. 18660* ("*1860*") (holotype: HAC [ex SV]).

3. Exostema glaberrimum Borhidi & M. Fernández, Acta Bot. Hung. 35:302. 1989. Type: CUBA. Guantánamo: Mun. Baracoa, parta del Yunque de Baracoa, bosque siempre verde mesófilo, 17 Apr 1986, *I. Arias, M. Díaz, E. Genes, J. Cutiérrez, R. Oviedo, R. Rankin & G. Stohr HAJB 58878* (holotype: HAJB [HAJB G 000452]; isotype: B [B 10 0280881]).

Distribution.—Cuba (Guantánamo: Yunque de Baracoa).

4. Exostema lancifolium Borhidi & Acuña, in Borhidi & Muñiz, Acta Bot. Acad. Sci. Hung. 17:28, fig. 12. 1972 ["1971"]. TYPE: CUBA. HOLGUÍN: Moa, Mina Potosi, above Yamanigüey, 1968, *V. Samek No. 26830* (**LECTOTYPE, here designated:** HAC [ex SV, specimen A (**Fig. 1**)]; ISOLECTOTYPE: HAC [ex SV, specimen B]).

Distribution.—Cuba (Holguín: Moa; Guantánamo: Baracoa).

Notes.—Borhidi and Acuña (in Borhidi & Muñiz, 1972:28–29) cited the type of *Exostema lancifolium* Borhidi & Acuña as "Typus: Prov. Oriente; Region de Moa, in fruticetis serpentinosis ad Minas Potosi, supra Yamanigüey. Leg. V. Samek V. 1968, No. 26830 SV." The code "SV" refers to the Herbarium of the Estación Experimental Agronómica of Santiago de las Vegas, which has been integrated into HAC. Borhidi et al. (2017:110) cited the type of *Exostema lancifolium* as "Tipo: Cuba, Prov. Holguín, Region de Moa, […], supra Yamanigüey. Leg. V. Samek, 1968. Holotipo: SV 26830 (HAC)."

In HAC there are two specimens of *Samek No. 26830*. Both of them are annotated as "Exostema lancifolium Borhidi & Acuña" by Borhidi. To distinguish them, I wrote the letters "A" and "B" in pencil directly on the sheets. These two letters mean that the two sheets should be treated as two different specimens. Specimen A (Fig. 1) consists of a branch with numerous leaves, two dehisced capsules, and several flower buds, and is here designated the lectotype of *Exostema lancifolium*. Specimen B consists of a branch with numerous leaves, half of a dehisced capsule, and two flower buds, and is an isolectotype.

Exostema lucidum Borhidi & M. Fernández, Acta Bot. Hung. 35:302. 1989. *Exostema lancifolium* var. *lucidum* (Borhidi & M. Fernández) Borhidi, Rubiáceas de Cuba 110. 2017. Type: CUBA. Holguín: Moa, near Minas Jaragua, barranco del Arroyo Jaragua cerca la Mina Jaragua, 200 m, 3 May 1980, *A. Álvarez de Zayas, J. Bisse, J. Gutiérrez & F.K. Meyer HAJB 42659* (**LECTOTYPE, here designated:** HAC [ex HAJB]; isolectotype: B [B 10 0273062]).

Notes.—Borhidi & Fernández Zequeira (1989:302), in the protologue of *Exostema lucidum* Borhidi & M. Fernández, did not specify which HAJB specimen is the holotype. Borhidi et al. (2017:110) cited the type of *Exostema lucidum* as "Tipo: Cuba Oriental, Prov. Holguín; Moa; Barranco del arroyo Jaragua […]. Col. Alvarez et al. 3.05.1980. Holotipo: HAJB 42659, isotipo: HAJB."

As a result of a detailed search in HAJB, no original material *Exostema lucidum* was found. The HAJB curator, Eldis R. Béquer (pers. comm.), is not aware of the possible location of the original specimens of this name. All the HAJB specimens of *Exostema* previously on loan to JPU, for study by Borhidi, have been returned.

In HAC there is a specimen of *Alvarez et al. HAJB 42659*, which was donated by HAJB to HAC. On the upper right corner of the sheet is the stamp "Herbario del Jardin Botanico Nacional, Universidad de La Habana. HAJB." On the specimen is affixed a label with the annotation "ISOTYPUS! Exostema lucidum Borhidi et Fernández by Borhidi." On the specimen label the collectors are cited as "J. Bisse, F. Meyer, A. Alvarez, J. Gutierrez." The specimen consists of three branches with numerous leaves and numerous flowers in anthesis, and is here designated the lectotype of this name.

5. Exostema nitens Urb., Rep. Sp. Nov. 17:7. 1921. TYPE: DOMINICAN REPUBLIC. PEREVIA: Cordillera Central, San José de Ocoa, en el lugar llamado Amacey Gordo, 18°33′N, 70°35′W, 810 m, 8 Mar 2000, *A. Veloz & M. De La Cruz 2066* (**NEOTYPE, here designated:** FLAS [No. 209895]; ISOTYPES: MO [No. 5677546], NY n.v.).

Distribution.—Dominican Republic (Cordillera Central).

Notes.—Urban (1921b:7), in the protologue of *Exostema nitens* Urb , cited the gathering *Bertero 325* without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. A search in Jstor Global Global Plants and Jacq virtual herbaria, and in G, G-DC, and TO herbaria, did not find any original specimen associated with this name. Hence it is necessary to designate a neotype for this name. The gathering *Veloz & De La Cruz 2066* has flowers in anthesis and mature fruits, and has duplicates distributed in several herbaria. The specimen in FLAS, with accession number 209895, is here designated as the neotype of *E. nitens*.

6. Exostema purpureum Griseb., Cat. Pl. Cub. 125. 1866. TYPE: CUBA. HOLGUÍN: Cuchillas de Baracoa, 1860–1864, *C. Wright 2671* (**LECTOTYPE, here designated:** GOET [GOET010241]; ISOLECTOTYPES: BM [BM001008864], G [G00436068], GH [00046006], MO [No. 2091689], YU [YU.001737]).

Distribution.—Eastern Cuba (Guantánamo: Baracoa; Holguín: Sierra Cristal, Sierra de Nipe, Sierra de Moa y Toa; Santiago de Cuba).

Notes.—Grisebach (1866:125), in the protologue of *Exostema purpureum* Griseb., cited the two Cuban gatherings, *Wright 2671* from the Baracoa Province, and *Wright 2680* from the Majari Province, without citing the herbarium of deposit. Grisebach's original material is in GOET, where he worked.

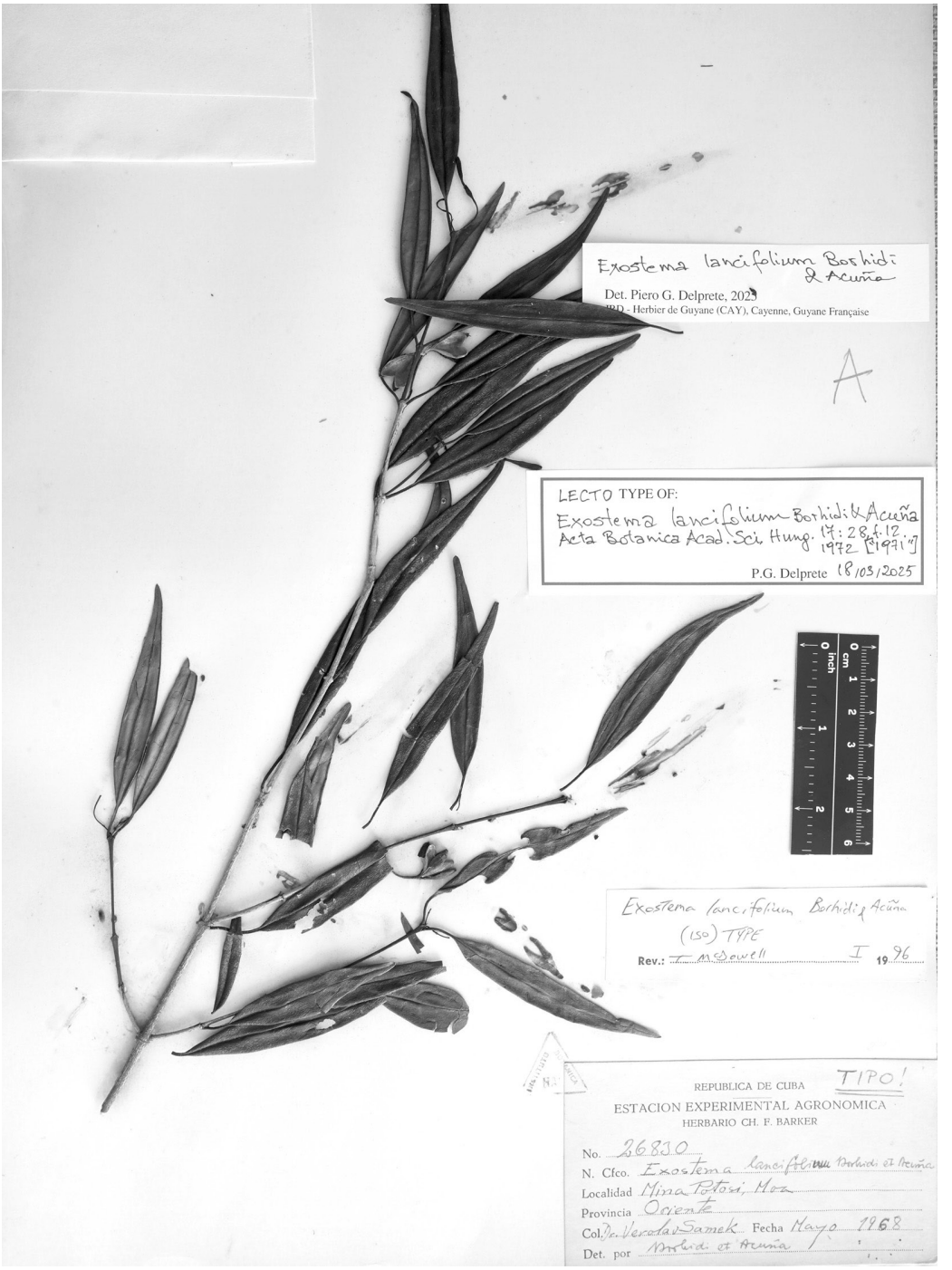

Fig. 1. Lectotype of *Exostema lancifolium* Borhidi & Acuña (*Samek No. 26830*, HAC [ex SV]). Reproduced with permission by the Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana, Cuba.

Borhidi et al. (2017:113; 2018:305) cited the type of *Exostema purpureum* as "Tipo: C. Wright 2761, Baracoa, holotipo: GOET, isotipos: GH, HAC, NY, BM, S, US." According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017:113; 2018:305) "holotype" citations cannot be treated as valid lectotype designations.

The GOET specimen of *Wright 2671*, with barcode GOET010241, has a label with the annotation "E. glabrum, foliis ovati acuti floris axillaris superant. […]" handwritten by Grisebach. This specimen consists of a branch with numerous leaves and a pair of old flowers with the corolla fallen off. In the pocket affixed on the sheet there is a corolla in anthesis and a corolla in bud. This specimen is here designated as the lectotype of *E. purpureum*.

The GOET specimen of *Wright 2680*, with barcode GOET010240, has a label with the annotation "Exostema an purpureum? n. sp. E. caribeum aff.? […]" handwritten by Grisebach. This specimen consists of a branch with numerous leaves and a few capsules. In the pocket affixed on the sheet are included parts of a capsule and several seeds.

Exostema purpureum ssp. *mensurensis* Kitanov, Ann. Univ. Sofia Fac. Biol. 64:275. 1972. TYPE: CUBA. HOLGUÍN: Sierra de Nipe, Mayarí, Loma de la Mensura, 21 Apr 1960, *Alain [Liogier], Acuña [J. Acuña Galé] & Ramos 7985* (HOLOTYPE: HAC [ex SV]). (**Fig. 2**).

Exostema purpureum ssp. *avenium* Borhidi & M. Fernández, Acta Bot. Hung. 35:302. 1989. TYPE: CUBA. HOLGUÍN: Majari Province, 1860–1864, *C. Wright 2680* (HOLOTYPE: HAC; ISOTYPES: BM [000028157], F [No. 776427 (frag.)], GH [00061490], GOET [GOET010240], K [K000173621], NY n.v., MO [2091688], YU [YU.065588]).

Exostema revolutum Borhidi & M. Fernández, Acta Bot. Hung. 35:301. 1989. TYPE: CUBA. GUANTÁNAMO: Laderas al NE de la confluencia del Río Baracoa con Arroyo del Cayo Peladeros de Jauco, 20 Feb 1979, *R. Berazaín, L. Catasús, M. Duharte, R. Capote & A. López HAJB No. 39753* (HOLOTYPE: HAJB [HAJB G 000461]; ISOTYPES: B [B 10 0009700], HAJB [2 sheets, HAJB G 000462, HAJB G 000463]).

7. Exostema salicifolium Griseb., Cat. Pl. Cub. 125. 1866. TYPE: WESTERN CUBA: without locality, 1860–1864, *C. Wright 2676* (FIRST-STEP LECTOTYPE (Borhidi & Fernández Zequeira 1989:292), **SECOND-STEP LECTOTYPE, here designated:** GOET [GOET010242]; ISOLECTOTYPES: BM [00028153], G [G00436065], GH [00046010], HAC, K, MO [No. 2091692], NY [00077385], US [00130606], YU [YU.001739]).

Distribution.—Cuba (Artemisa: Bahia Honda, Toscano; La Habana; Pinar del Río).

Notes.—Grisebach (1866:125), in the protologue of *Exostema salicifolium* Griseb., cited the material examined as "Frutex arborescens, floribus albis odoratis" (Schomb.).—Cuba occ. (Wr. 2676); Haiti pr. S. Domingo (Schomb. 42)" without citing the herbarium of deposit.

Borhidi and Fernández Zequeira (1989:292) cited the type of *Exostema salicifolium* as "Tipo: Wr. 2676 [Wright 2676]" without citing the herbarium of deposit. Hence, their citation is a first-step lectotype designation.

Borhidi et al. (2017:115; 2018:306) cited the type of *Exostema salicifolium* as "Tipo: C. Wright 2676 Cuba Occidental. Holotipo: GOET, isotipos: GH, HAC!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017:115; 2018:306) type citations cannot be treated as inadvertent lectotype designations.

The specimen *Wright 2676* in GOET, with barcode GOET010242, is here designated as the second-step lectotype of *Exostema salicifolium*.

8. Exostema spinosum (Le Vavass.) Krug & Urb., Ber. Deutsch. Bot. Ges. 15:262. 1897.

8a. Exostema spinosum (Le Vavass.) Krug & Urb. ssp. **spinosum**, Ber. Deutsch. Bot. Ges. 15:262. 1897. *Cinchona spinosa* Le Vavass., Observ. Phys. 37:243. 1790. TYPE: [icon]: Table 2 of Vavasseur, Observ. Phys. 37(2). 1790 (**LECTOTYPE, here designated**).

Distribution.—Cuba (the whole island), Haiti, and Dominican Republic.

Notes.—Le Vavasseur (1790:243–244, tab. 2) described *Cinchona spinosa* Vavass. with ample details, without citing any specimen. After a general search in many herbaria, no original specimen associated with name was found. In Le Vavasseur's Plate 2 is depicted a branch with numerous lateral branchlets, each of them with numerous minute leaves. Each branchlet terminates with an acicular thorn, which has extremely reduced internodes. On the branch are also depicted several flower buds at different stages of development,

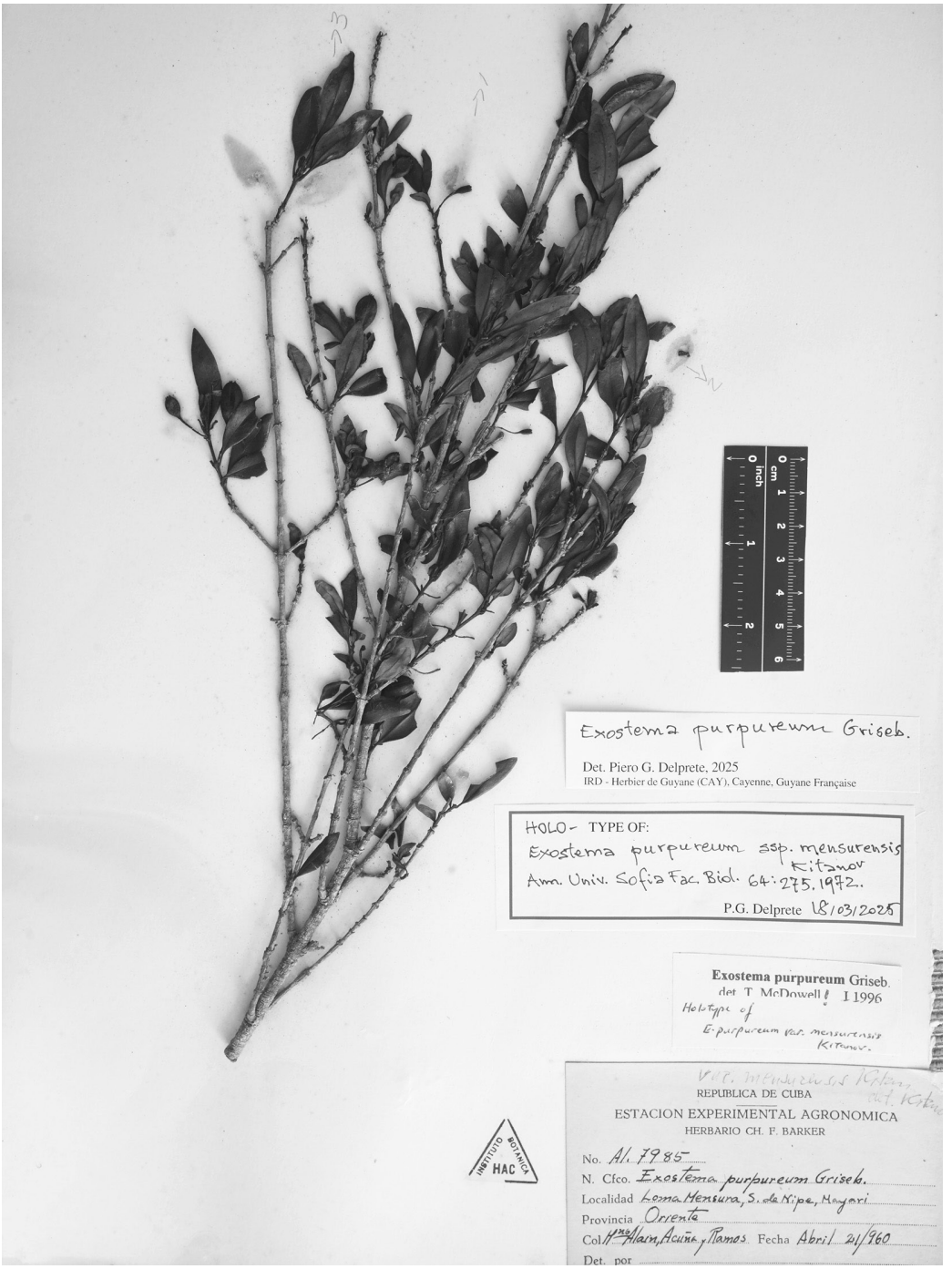

Fig. 2. Holotype of *Exostema purpureum* ssp. *mensurensis* Kitanov (*Alain et al. 7985*, HAC [ex SV]). = *Exostema purpureum* Griseb. Reproduced with permission by the Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana, Cuba.

and two flowers in anthesis with four exserted stamens, and the exserted style. On the plate are also depicted a flower bud (a), a flower in anthesis (b), a separate ovary and style (c), dehisced capsules (d), details of placentation (e), and seeds (f and g). The details on this plate are sufficient for the unequivocal application of the name, and this plate is here designated as the lectotype of *Cinchona spinosa*. https://gallica.bnf.fr/ark:/12148/bpt6k9603516s/f257.item (plate after page 320).

Catesbaea vavassorii Spreng., Syst. Veg., ed. 16, 1:416. 1825. *Catesbaea elliptica* Spreng. ex DC., Prodr. 4:401. 1830, *nom. illeg. pro syn.* (under *Catesbaea vavassorii* Spreng.). *Exostema vavassorii* (Spreng.) Griseb., Cat. Pl. Cub. 126. 1866. TYPE: [icon]: Table 2 of Vavasseur, Observ. Phys. 37(2). 1790 (**LECTOTYPE, here designated**).

***Notes.*—**Sprengel (1825:416), in the protologue of *Catesbaea vavassorii* Spreng., cited the material studied as "*Hispaniola*. (Cinchona spinosa Vavass. in Rozier. obs. phys. tom. 37)." Hence he cited table 2 of Vavasseur, Observ. Phys. 37(2). 1790, which is here designated as the lectotype of this name.

8b. Exostema spinosum ssp. **tortuense** (Urb.) Borhidi, Bot. Koz. 62:27. 1975. *Exostema spinosum* var. *tortuense* Urb., Arkiv. Bot. 21A (5):72. 1928 ["1927"]. TYPE: HAITI: Île de Tortue, coastal cliffs at Boucan-Guêpes, 22 May 1925, *E.L. Ekman 4087* (**LECTOTYPE, here designated:** S [S07-14968]; ISOLECTOTYPE: S [S07-14962]).

***Distribution.*—**Haiti (Île de Tortue).

***Notes.*—**Urban (1928a ["1927"]:72) in the protologue of *Exostema spinosum* var. *tortuense* Urb., cited the material studied as "Insula la Tortue in scopulosis littoralibus ad Boucan-Guêpe, m. Majo fl. et fr: [Ekman] n. H 4087," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. In S there are two specimens of *Ekman 4087*. The specimen with accession number S07-14968 has a label with the annotation "Exostema spinosum (Vavass.) Krug et Urb. var. tortuense (typus)" handwritten by Urban. The specimen consists of three branches with numerous small leaves, and several capsules, and is here designated as the lectotype of *E. spinosum* var. *tortuense*.

The S specimen with accession number S07-14962 has a label with the same annotations of the other *Ekman 4087* at S, but is not annotated by Urban. This specimen also consists of three branches with numerous small leaves, and several capsules, and is an isolectotype.

EXOSTEMA EXCLUDED TAXA

Exostema australe A. St. Hil., Pl. Usuel. Bras. 1(3):2–4, tab. 3. 1824. TYPE: [icon.]: A. Saint-Hilaire, Plantes Usuelles des Brasiliens 1(3):2–4, tab. 3B. 1824 (LECTOTYPE (Germano Filho 1999:59)). BRAZI: [São Paulo], Mogy das Cruzes, s.d., *A. Saint-Hilaire Cat. D, N° 653* (**EPITYPE, here designated:** P [P03921477]; ISOEPITYPE: P [P03921483]).

= *Bathysa australis* (A. St. Hil.) K. Schum., in Martius et al., Fl. Bras. 6(6):239. 1889.

***Notes.*—**Saint-Hilaire (1824:1(3):2–4), in the protologue of *Exostema australe* A. St. Hil., provided a detailed description, and cited the range of the species as growing in the forests of southern Brazil, southwards until the state of São Paulo. Germano Filho (1999:59) cited as type of this name table 3, fig. B of Saint-Hilaire's first volume of *Plantes Usuelles du Brasil*, associated with name *Exostema*. In figure B of table 3, are only depicted a capsule in side view, and a flower in anthesis in side view with exserted stamens. These characters are present in several species of *Exostema*, *Bathysa*, and numerous other Rubiaceae genera with capsular fruits. Hence, figure B is not sufficient to undoubtedly identify this species. To remove any doubt about the application of the name, an epitype needs to be designated. In P there are several specimens associated with this name, collected by A. Saint-Hilaire in Brazil. Specimen with barcode P03921477 has a label affixed on the bottom-left corner of the sheet, with the annotation "Exostema australe Aug. de S. Hil., Plan. us. Bras. Bois vierges prov. Mogy das Cruzes (A. de Saint-Hilaire Scr.)" handwritten by A. Saint-Hilaire. On the bottom-right corner of the sheet is affixed another label with the annotation "BRÉSIL.—Province de Saint-Paul. Voyage de Saint-Hilaire, de 1816 à 1821. Cat. D, N° 653." The specimen consists of a distal portion of a branch, with large stipules, a large leaf, and infructescences with numerous capsules. This specimen is here designated as the epitype of *E. australe*.

Exostema bicolor Poepp , in Poeppig & Endlicher, Nov. Gen. Sp. Pl. 3:32. 1841.

= *Motleyothamnus corymbosum* (Ruiz & Pav.) Paudyal & Delprete (See below).

Exostema canescens Bartl. ex DC., Prodr. 359. 1830 (as "*Exostemma*"). *Cinchona canescens* (Bartl. ex DC.) Brign., Mem. Mat. Fis. Soc. Ital. Sci. Modena, Pt. Mem. Fis. II, 1:63. 1862.

= *Hintonia latiflora* (DC.) Bullock (See below).

Exostema capitatum Spreng., Neue Entd. 2:143. 1821. TYPE: Not traced.

= *Phragmanthera capitata* (Spreng.) Balle, Adansonia, n.s., 1:251. 1962. (Loranthaceae).

Exostema coriaceum (Poir.) Schult., in Roemer & Schultes, Syst. Veg. ed. 15 [bis], 5:20. 1819. [*Cinchona coriacea* Poir. in Lamarck, Encycl. 6:38. 1804]
= *Solenandra coriacea* (Poir.) Delprete, **comb. nov.** (See below)

Exostema corymbosum (Ruiz & Pav.) Spreng., Syst. Veg. 1:706. 1824 ["1825"]. *Portlandia corymbosa* Ruiz & Pav., Fl. Peruv. 2:49. 1799.
= *Motleyothamnus corymbosum* (Ruiz & Pav.) Paudyal & Delprete (See below).

Exostema coulteri Hook. f., in Hemsley, Diagn. Pl. Nov. Mexic. 32. 1879. TYPE: MEXICO. HIDALGO: Zimapán, s.d., *J. Coulter 209* (HOLOTYPE: K [K000173537]; ISOTYPE: MO [No. 3751087]).
= *Syringantha coulteri* (Hook. f.) T. McDowell, Novon 6(3):278. 1996.

Exostema cuspidatum A. St. Hil., Pl. Usuel. Bras., tab. 3. 1824. *Schoenleinia cuspidata* (A. St. Hil.) Klotzsch, Getreue Darstell. Gew. 14(2):tab. 15. 1846. *Cinchona cuspidata* (A. St. Hil.) Brign., Mem. Mat. Fis. Ital. Sci. Modena, Pt. Mem. Fis., ser. 2, 1:63. 1862. *Bathysa cuspidata* (A. St. Hil.) Hook. f. ex K. Schum. in Martius et al., Fl. Bras. 6(6):237. 1889. TYPE: BRAZIL: Minas Gerais, "Cueilli dans les bois près Itajuru, Cap de Moines," 1816–1821, *A. Saint-Hilaire Catal. B1 No. 970* (LECTOTYPE (Taylor et al. 2011:503): P [P00752481]; ISOLECTOTYPES: P [2 sheets, P00752482, P00752483]; POSSIBLE ISOLECTOTYPE: F [No. 970756, barcode F0069068F (ex P, without collection number)]).
= *Schizocalyx cuspidatus* (A. St. Hil.) Kainul. & B. Bremer, Amer. J. Bot. 97:1976. 2010.

Exostema dissimiliflorum (Mutis ex Humb.) Schult , in Roemer & Schultes, Syst. Veg., ed. 15[bis], 5:17. 1819. *Cinchona dissimiliflora* Mutis ex Humb., Mag. Neuesten Entdeck. Gesammemten Naturk. Feunde Berlin 1:120. 1807. *Ladenbergia dissimiliflora* (Mutis ex Humb.) Klotzsch, Getreue Darstell. Gew. 14(2):tab. 15. 1846. *Macrocnemum dissimiliflorum* (Mutis ex Humb.) Triana, Revista Acad. Colomb. Ci. Exact. 2:416. 1938. TYPE: COLOMBIA: without locality (not found).
= *Ferdinandusa dissimiliflora* (Mutis ex Humb.) Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 7:22. 1930.

Exostema formosum Cham. & Schltdl. ex DC., Prodr. 4(4):361. 1830. *Exostema formosum* Cham. & Schltdl., *nom. inval.,* Linnaea 4:179. 1829. *Rustia formosa* (Cham. & Schltdl. ex DC.) Klotzsch, in Hayne, Getr. Darstell. Gew. 14:tab. 15. 1846. TYPE: BRAZIL: without locality, s.d., *Collector Unknown s.n.* (LECTOTYPE (Delprete 2024:144): G-DC [G00665732]).
= *Rustia formosa* (Cham. & Schltdl. ex DC.) Klotzsch, in Hayne, Getr. Dartell. Gew. 14:tab. 15. 1846.

Exostema formosum var. α *leprosum* DC., Prodr. 4(4):361. 1830. *Exostema formosum* forma β *laeve* Cham. & Schltdl., *nom. inval.,* Linnaea 4: 179. 1829. TYPE: BRAZIL: without locality, s.d., *F. Sellow s.n.* [*1814*] (LECTOTYPE (Delprete 2024:144): HAL [HAL097786]).
= *Rustia formosa* (Cham. & Schltdl. ex DC.) Klotzsch, in Hayne, Getr. Dartell. Gew. 14:tab. 15. 1846.

Exostema formosum var. β *laeve* DC., Prodr. 4(4):361. 1830. *Exostema formosum* forma α *leprosum* Cham. & Schltdl., *nom. inval.,* Linnaea 4:179. 1829. TYPE: BRAZIL: without locality, s.d., *Collector Unknown [Sellow] s.n.* (LECTOTYPE (Delprete 2024:144): G-DC [G00665732]; ISOLECTOTYPE: HAL [HAL097787 (collected by Sellow)]).
= *Rustia formosa* (Cham. & Schltdl. ex DC.) Klotzsch, in Hayne, Getr. Dartell. Gew. 14:tab. 15. 1846.

Exostema leonis Standl., Publ. Field. Mus. Nat. Hist., Bot. Ser. 8:338. 1931. TYPE: CUBA. PINAR DEL RÍO: Loma Pelada, Cayajabos, 9 Aug 1928, *Bro. León & J.T. Roig 13531* (HOLOTYPE: NY [00077374]).
= *Acunaeanthus tinifolius* (Griseb.) Borhidi, Acta Bot. Acad. Sci. Hung. 26:286. 1981 ["1980"].

Exostema macrocnemia (Mart.) G. Don, Gen. Hist. 3:482. 1834. *Cinchona macrocnemia* Mart., Ann. Sci. Nat., Bot., sér. 3, 10:13. 1848. TYPE: COLOMBIA. [CAQUETÁ]: "Mount Araracoara" [Araracuara], s.d. [Jan 1820], *C.F.P. Martius s.n.* (M? not found).
= *Remijia macrocnemia* (Mart.) Wedd., Ann. Sci. Nat., Bot., sér. 3, 10:13. 1848.

Exostema neriifolium A. Rich., in R. de la Sagra, Hist. Fis. Cuba, Bot. 11:7. 1850. TYPE: CUBA: "Vuelta de abajo," s.d., *J. Maria Valenzuela s.n.* (P? [not there]).
= *Suberanthus neriifolium* (A. Rich.) Borhidi & M. Fernández, Acta Bot. Acad. Sci. Hung. 27:316. 1982 ["1981"].

Exostema occidentale Benth., Bot. Voy. Sulphur 104. 1845 ["1844']. TYPE: COLOMBIA: NARIÑO: Isla Gorgona, 1841, *R.B. Hinds 354* (LECTOTYPE (Delprete 1999b:7): K [K000470115]; ISOLECTOTYPE: BM [barcode unknown]).
= *Rustia occidentalis* (Benth.) Hemsl., Biol. Centr.-Amer., Bot. 2:14. 1881.

Exostema orbiculatum Proctor, J. Arnold Arbor. 63:303. 1982. TYPE: See under *Erithalis orbiculata* (above).
= *Erithalis orbiculata* (Proctor) A.R. Franck, P.A. Lewis & Oberli (See above).

Exostema souzanum Mart., in Martius & Spix, Reise Bras. 2:789. 1828. *Cinchona souzana* (Mart.) Brign., Mem. Mat. Fis. Soc. Ital. Sci. Modena, Pt. Mem. Fis., ser. 2, 1:63. 1862.
= *Coutarea hexandra* (Jacq.) K. Schum. (See above).

HINTONIA

Bullock (1935) separated *Hintonia* from *Coutarea* because of its cylindrical capsules (vs. laterally compressed in *Coutarea*) and basipetal-imbricate seeds (vs. vertical in *Coutarea*). He dedicated the genus name to George B. Hinton (1882–1943), a London-born metallurgist and avid plant collector based in southern Mexico. The taxonomic placement of *Hintonia* within the family has differed according to various authors. Aiello (1979) treated *Coutarea* and *Hintonia* as members of the *Portlandia* complex. Robbrecht (1988, 1994) removed *Hintonia* from Condamineeae and listed it among the *genera incertae sedis*. Andersson and Persson (1991), according their phylogenetic study using morphological data, removed *Coutarea* and *Exostema* from Cinchoneae, and returned them to Condamineeae. Bremer (1992) and Delprete (1996b) in their morphology-based phylogenies, retrieved *Coutarea* and *Hintonia* as sister genera, closely related to *Portlandia*. Bremer (1992) placed all three genera in the amended Chiococceae. Ochoterena-Booth (2000) revised *Hintonia* in an unpublished doctoral dissertation, maintained the distinction between *Hintonia* and *Coutarea*, and their inclusion in the *Portlandia* group *sensu* Delprete (1996b). Paudyal et al. (2018) were able to include only *Hintonia latiflora* Bullock and *H. octomera* Bullock in their molecular phylogenetic study, and confirmed that the genus is monophyletic, and was positioned as a sister taxon to the clade including *Coutarea* and the two South American species of *Exostema* (which were transferred to other genera).

Hintonia is a genus of three species occurring in Mexico and Central America of shrubs or trees to 10 m tall, with axillary uniflorous inflorescences, 6–8-merous flowers, fragrant from the afternoon to the evening, stigmatic surface as two lines along the style, capsules ellipsoid to subspherical, round in cross-section, and seeds acropetally or centripetally aligned (Ochoterena-Booth, 2012b).

Hintonia Bullock, in Hook. Ic. Pl. 33, tab. 3295. 1935. Ochoterena-Booth, Fl. Mesoamericana 4.2:118–119. 2012; Borhidi et al., Rubiáceas México 263–267, f. 54. 2006; Borhidi et al., Rubiáceas México, 2nd ed. 282–286, f. 62. 2012; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018. Type: *Hintonia latiflora* (DC.) Bullock

1. Hintonia latiflora (DC.) Bullock, in Hooker's Icon. Pl. 33(4):tab. 3295, p. 4. 1935. *Coutarea latiflora* DC., Prodr. 4:350. 1830. Type: [MEXICO]. [icon.]: Torner Collection Plate No. 0856, preserved in the Hunt Institute for Botanical Documentation (Lectotype (McVaugh 2000:463)).

***Distribution.*—**Mexico, Guatemala, and El Salvador.

***Notes.*—**Augustin Pyramus de Candolle (1830:350) in the protologue of *Coutarea latiflora* DC., stated "C. latiflora (fl. mex. ic. ined.) pedicellis I-floris, ubi dicitur *Copalchi*." Therefore, the authority of this name should be attributed solely to him. There is no original specimen of *C. latiflora* in G or G-DC. In MA, there are two specimens in the Sessé & Mociño Herbarium, one with barcode MA605137, *Sessé & Mociño 5470*, which has a label with the handwritten annotation "Portlandia grandiflora. N° 135," and the other with barcode MA605138, *Sessé & Mociño 1620*, which has a label with the handwritten annotation "Portlandia hexandra. N° 474." The two specimens in MA are not original material, because they were not examined by Candolle.

The history of the Sessé and Mociño Expedition (1781–1803), itinerary, herbarium, illustrations, and impact in the botanical world, was addressed in great detail by McVaugh (1969, 1972, 1977, 1980, 1982, 1987, 1990, 1998, 2000), and is here summarized. The King Charles III of Spain, established the Royal Botanical Expedition to New Spain (*Expedicion Botánica al Virreinato de Nueva España*), headed by the Spanish doctor Martín Sessé y Lacasta (1751–1808). The team of botanists that took part in the expedition included the Mexican-born Doctor José Mariano Mociño Suárez Lozano (1757–1820), who later became Sessé's most important collaborator. During the expedition, aside from the botanical collections, a team of artists made about 2000 paintings on the spot, using living material. After Sessé and Mociño return to Spain, Mociño carried all those paintings to Montpellier, to be examined by A.P. de Candolle. Candolle studied them in great detail and travelled with Mociño and those paintings to Geneva, and used them to describe hundreds of new species. Learning about the imminent departure of Mociño to return to Spain, Candolle hired several local artists to make copies of those paintings, which are now kept in G-DC. Candolle organized the copies of the original paintings, numbered them, and provided a handwritten index.

Mociño left Montpellier with the bulk of about 2000 original paintings and arrived at Barcelona, where he died shortly after, in 1820. The paintings disappeared for a long time, and were eventually found in 1979 in a private library in Barcelona. They were acquired in 1981 by the Hunt Institute for Botanical Documentation, in Pittsburgh, Pennsylvania (McVaugh, 1982), where they comprise the Torner Collection of Sessé & Mociño Biological Illustration (https://huntbot.org/torner/). When the paintings arrived at the Hunt Institute, they were bound in volumes. They were separated as single pages at the Hunt Institute, without particular systematic arrangement, and to each painting was assigned a "Torner Number." The paintings of the Torner collection represent the original material of the new taxa described by Candolle, as they were studied and annotated by him in Montpellier during 1813–1816, and in Geneva in 1816–1817.

McVaugh (2000) explained in detail the typification of the names published by Candolle, using the original illustrations made during the Sessé and Mociño expedition, which are now part of the Torner Collection. McVaugh (2000:463) designated the lectotype of *Coutarea latiflora* DC. as follows, "Lectotype [DC.]: No. 0856 of the Torner Collection, annotated by de Candolle "Coutarea latiflora" and "colpachi." DC. plate 458, as cited in Calques des Dessins (Field Mus. neg. 30687), is an original painting, nearly identical with Torner 0856, annotated "Portlandia hexandra" and "colpachi"."

Ochoterena-Booth (2012:119) cited the type of "*Coutarea latiflora* Sessé et Moc. ex DC." as "Holotipo: México, Michoacán, *Sessé y Mociño s.n.* (G-DC!)." However, as explained above, the authority of this name should be attributed solely to Candolle, and there is no original specimen associated with this name in G-DC.

Exostema canescens Bartl. ex DC., Prodr. 4:359. 1830 (as "*Exostemma*"). *Cinchona canescens* (Bartl. ex DC.) Brign., Mem. Mat. Fis. Soc. Ital. Sci. Modena, Pt. Mem. Fis. II, 1:63. 1862. Type: MEXICO: without locality, 1791, *Haenke s.n.* (LECTOTYPE, **here designated:** PR [No. 612234]; isolectotypes: G-DC [G00665709], GOET [GOET010233], HAL [HAL0114173], PR [No. 612235]).

Notes.—Candolle (1830:359) attributed the authority of *Exostema canescens* to Bartling, as "E. canescens (Bartl! in h. Haenk.), and described it as being villous-canescent, with axillary inflorescences, and pedicels as long as the capsules, and capsules not crowned by the calyx. He also stated that it was collected by Haenke in Mexico, and "v. sine fl. in h. Haenke." The last statement means that he saw a specimen in the Haenke Herbarium. According to Stafleu and Cowan (1979:6), Thaddeus Haenke's herbarium is in PR.

In PR there are two original specimens associated with this name. Specimen with accession number 612234 has three labels. At the bottom of the sheet there is a label with heading "Herbarium Generale Musei Nationalis Pragae" and the stamps "1791" and "Thaddeus Haenke." On this label is glued a smaller label with the handwritten annotation "Mexico Rubiacea." Above the bottom label is glued another label with the annotation "Exostemma canescens Bartl." handwritten by an unknown author. A third label has the handwritten annotation "Mexico Rubiacea." The specimen consists a branch with lateral branches with several leaves and several capsules, some of them still closed, and some of them dehisced. This specimen, collected in Mexico by Haenke in 1791, with accession number 612234, is here designated the lectotype of *Exostema canescens*.

The PR specimen with accession number 612235 has two labels. At the bottom of the sheet there is a label with heading "Herbarium Generale Musei Nationalis Pragae" and the stamps "1791" and "Thaddeus Haenke." On this label is glued a smaller label with the handwritten annotation "Mexico Rubiacea." Above that label, is affixed another label with the annotation "Peruanae montanae Rubiacea" handwritten by Sternberg. The second label is certainly an error, because the specimen is from Mexico, and not from Peru. The specimen consists of a small branch with two leaves and a dehisced capsule. This specimen is an isolectotype of *Exostema canescens*.

In G-DC there is a sheet, with barcode G00665709, which has a label with the annotation "Exost. canescens Mexico Hb. Haenke." The specimen consist of just a few fragments contained in an envelope. Those fragments were extracted by Candolle from a specimen in the Haenke herbarium, which was examined by him. This G-DC specimen is an isolectotype.

A specimen in GOET, barcode GOET010233, has two labels with the annotations "1. Exostemma canescens Bartl. Mexico" and "Exostemma canescens Bartl. In Mexico leg. Haenke" handwritten by unknown authors. On the sheet there is a third label with the annotation "possibly Coutarea sp." by Tim McDowell. The specimen consists of a small branch with a few leaves, and fragments of leaves and capsules included in an envelope. This specimen is an isolectotype.

In HAL there is a specimen, with barcode HAL0114173, which a label with the annotations "Exostemma canescens Bartl. Mexicis Haenke" handwritten by two unknown authors. The specimen consists of a small branch with a few leaves, and capsule fragments included in the attached envelope. This specimen is an isolectotype.

Standley (1921:126) regarding this taxon wrote, "Described from Mexico; inflorescence axillary, 1-flowered; leaves pubescent. Probably not of this genus." Because of the peculiar pubescence of the vegetative parts, and the impression on the capsule internal walls, indicating the horizontal position of the seeds, this taxon is a synonym of *Hintonia latiflora* (DC.) Bullock.

Portlandia pterosperma S. Watson, Proc. Amer. Acad. Arts 24:52. 1889. *Coutarea pterosperma* (S. Wats.) Standl., N. Amer. Fl. 32:127. 1921. TYPE: MEXICO. SONORA: In deep canyons near Guaymas, 1887, *E. Palmer 298* (HOLOTYPE: BM n.v.; ISOTYPES: C [without barcode],

E [E00285404], GH, K [K000173483], MEXU [MEXU 00031099], NDG [NDG50849], NY [02684370], US [4 sheets, No. 1390863 (without barcode), No. 1390864 (barcode 01013598), No. 47978 (barcode 00137335), No. 47979 (barcode 00137334)], YU [YU.001750]).

Hintonia latiflora var. *leiantha* Bullock in Hooker's Icon. Pl. 33(4):1, 5, tab. 3295. 1935. TYPE: MEXICO. MEXICO: Distr. of Temascaltepec, Ixtapan, 1000 m, 5 Aug 1932, *G.B. Hinton et al. 1258* (HOLOTYPE: K n.v.; ISOTYPES: A [01154801], BM n.v., G [G00436275], RSA [RSA0005799]).

Hintonia standleyana Bullock, in Hooker's Icon. Pl. 33(4):6, tab. 3295. 1935, *nom. inval.* TYPE: Based on the description of *Coutarea latiflora* in Standley, N. Amer. Fl. 32:127. 1921, and Contr. U.S. Natl. Herb. 23:167. 1926.

2. Hintonia lumana (Baill.) Bullock, in Hooker's Icon. Pl. 33 (4):5, tab. 3295. 1935 (as "*Lumaeana*"). *Coutarea lumana* Baill., Adansonia 12:301. 1879 (as "*Lumaeana*" but honoring M.G. Luma). TYPE: GUATEMALA: without locality, s.d., *G. Luna* (or *Luma*) s.n. (HOLOTYPE: P [P00559099]).

Distribution.—Mexico, Guatemala, El Salvador, and Costa Rica.

Notes.—Baillon (1879:301) discussed *Coutarea lumana* Baill. as followed "L'éspece du Guatemala m'a été remise, il y a deux ans, par un jeune médecin du pays, M.G. Luma, d'où le nom de C. Lumeana que je lui ai donné." [The species from Guatemala was given to me, two years ago, by a young doctor, M.G. Luma, hence I gave it the name C. Lumeana]. According to the *Code* (Turland et al. 2018), because the specific epithet is dedicated to Luma, it should be corrected as *lumana*. A specimen in P, barcode P00559099, has a label with the annotations "Portlandia! Coutarea Lumaeana H. Bl. Sect. Pacourea (capsula septicida!). Guatemala. M.G. Luma (1878)" handwritten by Baillon. The annotation was corrected by an anonymous author, who stroked the letter "m" and substituted it with "n," with the intention to correct the last name of the collector as Luna. On the bottom center of the sheet is affixed another label with the annotation "A Monsieur Baillon. Professeur de Botanique à l'Ecole de Medecine de la part de George Luna de Guatemala" by an unknown author. Therefore, the doubt as whether the last name of the collector is Luma or Luna, remains. The specimen consists of two small branches with flowers in anthesis, and a loose, wrinkled-up corolla. This specimen is the holotype.

3. Hintonia octomera (Hemsl.) Bullock, in Hooker's Icon. Pl. 33(4):6, tab. 3295. 1935. *Coutarea octomera* Hemsl., Biol. Centr. Amer. 4:101. 1886. TYPE: MEXICO. YUCATÁN: Cozumel Island, 8 Apr 1885, *G.F. Gaumer 148* (HOLOTYPE: K n.v.).

Distribution.—Southern Mexico and Guatemala.

Coutarea acamptoclada B.L. Rob. & Millsp., Bot. Jarhb. Syst. 36 (Beibl. 80):28. 1905. TYPE: MEXICO. YUCATÁN: "im Walde bei Umán, 7 Apr 1902, *C. Seler & E. Seler 3944* (LECTOTYPE (Lorence 1999:44): F n.v. (photo in PTGB)).

HINTONIA EXCLUDED TAXA

Hintonia pulchra D.R. Simpson, Phytologia 29:277. 1974.
= *Osa pulchra* (D.R. Simpson) Aiello (See below).

ISIDOREA

Achille Richard completed a monograph of the family Rubiaceae, and gave a manuscript to A.P. de Candolle, which was supposed to be published soon, but it was instead published in December 1830. The volume of the *Prodromus* where Candolle treated the Rubiaceae was published in September 1830, preceding the publication of Richard's Rubiaceae monograph by three months. Richard (December 1830) included *Isidorea* in the tribe Cinchoneae, and explained that he dedicated the genus name to the zoologist Isidore Geoffroy Saint Hilaire (1805–1861, son of Étienne Geoffroy Saint-Hilaire). Candolle (September 1830:405) described the genus *Isidorea* A. Rich. ex DC., with the sole species *Isidorea amoena* A. Rich. ex DC., Prodr. 4:406. 1830, which is a superfluous name, because he cited *Ernodea pedunculata* Poir. and *Ernodea pungens* Lam. in synonymy. The epithet "pungens" was available for this species, which is what Candolle should have used to make a new combination. Robinson (1910:401) published the combination *Isidorea pungens* (Lam.) B.L. Rob. Urban (1923a) published the descriptions of all the species of *Isidorea* known to him. Aiello (1979) transferred three species from *Portlandia* to *Isidorea*, without any discussion about the species previously included in *Isidorea*, and esteemed that the genus has 11 species. Borhidi (1981), and Aiello and Borhidi (1986) described several

new species in this genus. Liogier (1995) estimated *Isidorea* to have approximately 20 species occurring in Cuba and Española, and produced a key to the Españolan species. In Paudyal et al.'s (2018) molecular phylogenies, *Isidorea* was confirmed to be monophyletic, and retrieved in a clade sister to the *Portlandia* clade. The *Isidorea* clade was divided into two subclades, one with the species from Cuba, and the other with species from the Dominican Republic. *Isidorea* differs from *Portlandia* in having stiff, pungent, coriaceous leaves and stipules divided at the base into two units, looking like four, apically pungent stipules per node, and smaller flowers. In the present treatment, 13 species are recognized in this genus.

Isidorea A. Rich ex DC., Prodr. 4:405. 1830; A. Richard, Mém. Rubiacées 284. 1830; A. Richard, Mem. Soc. Hist. Nat. Paris 5:284, tab. 25, f. 1. 1834; Standley, N. Amer. Fl. 32(1):14–15. 1918; Liogier, Fl. Cuba 5:28–29. 1962; Borhidi, Acta Bot. Hung. 29:181–216. 1981 ["1980"]; Liogier, Fl. Española 7:311, 313–318, f. 198-27. 1995; Borhidi et al., Rubiáceas Cuba 163–168, f. 45. 2017; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018. TYPE: *Isidorea amoena* A. Rich ex DC., Prodr. 4:405. 1830, *nom. superfl.* [= *Isidorea pungens* (Lam.) B.L. Rob.]

1. Isidorea brachyantha Urb., Ark. Bot. 17(7):57. 1922. TYPE: HAITI. DÉPART. DU SUD: prope Port à Piment in collibus siccis calcareis rara, [27 Jul 1917], *E.L. Ekman 401* (**NEOTYPE, here designated:** S [No. S-07-14592]; ISONEOTYPE: S [S-R-3048]).

Distribution.—Dominican Republic, Haiti.

Notes.—Urban (1922:57), in the protologue of *Isidorea brachyantha* Urb., cited the material studied as "Départ. du Sud prope Port à Piment in collibus siccis rara, m. Jul. flor.: [Ekman] n. 401." The original material in B studied by Urban was destroyed during WWII. In S there are two specimens of *Ekman 401*. The specimen with accession number S-07-14592 has a label with the heading "Mus. Botan. Stockholm" and the annotation "Isidorea brachyantha Urb. Typus. det. I. Urban" handwritten by an unknown author (not Urban). This specimen consists of three branches with numerous leaves and several capsules, and is here designated as the neotype of *I. brachyantha*.

The S specimen with accession number S-R-3048 has a label with the heading "Mus. Botan. Stockholm" and the annotation "Isidorea brachyantha Urb. Typus. det. I. Urban" handwritten by an unknown author (not Urban). This specimen consists of two branches with numerous leaves and several capsules, and is an isoneotype.

2. Isidorea brachycarpa (Urb.) Aiello, J. Arnold Arbor. 60:114. 1979. *Portlandia brachycarpa* Urb., Symb. Antill. 9:135. 1923. TYPE: CUBA. GUANTÁNAMO: Baracoa, ad Taco Bay, 5 Dec 1914, *E.L. Ekman 3758* (LECTOTYPE (Aiello 1979:114): S [No. S-R-5213]; ISOLECTOTYPES: F [No. 635301 (frag. ex G)], G [G00436336], UPS [No. V-084588]).

Distribution.—Cuba (Guantánamo: Bahia de Taco, Costa Sur-Maisí).

Notes.—Urban (1923a:135–136) in the protologue of *Portlandia brachycarpa* Urb., cited the material studied as "Prov. Oriente prope Baracoa ad Taco Bay, in rupibus calcareis rara, m. Dec. flor. et fruct.: [Ekman] n. 3758." The original material in B studied by Urban was destroyed during WWII. Aiello (1979:114) designated the lectotype of this name a specimen at S. The specimen with accession number S-R-5213 has a label with the annotation "Portlandia brachycarpa Urb. (typus)" handwritten by Urban. It consists of five branch tips with numerous leaves and dehisced capsules, and is the specimen designated as the lectotype by Aiello.

Isidorea leonis Alain, Contr. Ocas. Mus. Hist. Nat. La Salle 17:5. 1959, **syn. nov.** TYPE: CUBA. GUANTÁNAMO: Maisí, coastal thickets, Jan 1940, *Bro. León & P. Matos LS No. 17945* (HOLOTYPE: HAC [Specimen A, ex LS]; ISOTYPES: HAC [Specimen B, ex LS], NY [00115159], US [00026703]).

Notes.—In HAC there two specimens of *Bro. León & P. Matos LS No. 17945*, which where originally part of the LS herbarium, which was later integrated in HAC. These two specimens are identified by the letters "A" and "B" handwritten on the sheets to distinguish them from each other. Specimen with the letter "A" has a label with the annotation "Isidorea leonis Alain" handwritten by Alain Liogier, and is the holotype. Specimen with the letter "B" has the the typewritten annotation "Isidorea leonis Alain" and it has is no evidence that was seen by Alain Liogier.

3. Isidorea elliptica Alain, Contr. Ocas. Mus. Hist. Nat. Colegio De La Salle 17:4. 1959. TYPE: CUBA. ORIENTE: near Macambo, Vía Azul, dry coastal thickets, 28 Dec 1954, *Hno. Alain [A.H. Liogier] & M. López Figueiras 4198* (HOLOTYPE: HAC [ex LS]; ISOTYPES: BP n.v., HAJB [HAJB G 000520], NY [00115157]).

Distribution.—Cuba (Guantánamo: Macambo, San Antonio del Sur, Abra Mariana, Cajobabo-Jauco).

Isidorea rheedioides Borhidi, Abstr. Bot. Budapest 5:37. 1977, **syn. nov.** TYPE: CUBA. ORIENTE: in fruticetis litoralibus calcareis inter Cajobabo et Jauco, 31 Dec 1959, *Bro. Alain [A. Liogier] & López Figueiras 7097* (HOLOTYPE: HAC [ex LS]; ISOTYPES: HAJB [3 sheets, HAJB G 000518, HAJB G 000989, HAJB G 000990).

Isidorea microphylla Borhidi, Acta Bot. Acad. Sci. Hung. 26:268, fig. 4. 1981 ["1980"], **syn. nov.** TYPE: CUBA. GUANTÁNAMO: San Antonio del Sur, 4 km NW del pueblo (Abra Mariana), 200–400 m, 10 Feb 1976, *A. Areces, J. Bisse, J. Gutiérrez & H. Manitz HAJB No. 29924* [*HAC No. 28363*] (HOLOTYPE: HAJB [HAJB G 000519]; ISOTYPES: B [B 10 0385011], BP n.v., HAC [No. 28363], JE [JE00004995]).

4. Isidorea gonavensis Aiello & Borhidi, Acta Bot. Hung. 32:221. 1986. TYPE: HAITI. ÎLE DE GONÂVE: Pte.-à-Raquettes, Marne Fort-Fiel, 24 Jul 1927, *E.L. Ekman H-8664* (HOLOTYPE: S [No. S14-28111]; ISOTYPES: G [G00436335], GH [00058986], LL [00000280]).

Distribution.—Haiti (Gonâve Island).

5. Isidorea leonardi Urb., Repert. Spec. Nov. Regni Veg. 19:8. 1923. TYPE: HAITI: vicinity of Fond Parisien, Étang Saumâtre, upright shrub 4 to 5 ft high, scarce, flowers cream-white, very fragrant, 5–13 May 1920, *E.C. Leonard 4041* (**LECTOTYPE, here designated:** US [00026702]; ISOLECTOTYPES: BM [000081661 (specimen "a")], GH [00058985], NY [00115158]).

Distribution.—Dominican Republic, Haiti.

Notes.—Urban (1923c:8), in the protologue of *Isidorea leonardi* Urb., cited the material studied as "Vicinity of Fond Parisien, Etang Saumatre, Leonard 4041" without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. The US specimen with barcode 00026702, has a label the annotation "Isidorea" handwritten by an unknown author, and "Leonardii Urb. (typus)" handwritten by Urban. The specimen consists of two branches with numerous leaves and several flowers in anthesis, and two separate portions of a stem. This specimen is here designated as the lectotype of *I. leonardi*.

6. Isidorea leptantha Urb., Symb. Antill. 7:391. 1912. TYPE: DOMINICAN REPUBLIC. BARAHONA: Barahona, 200 m, Aug 1910, *M.D. Fuertes [Pater Fuertes] 634* (**LECTOTYPE, here designated:** BR [000000531699]; ISOLECTOTYPES: E [E00505337], F [Nos. 768324 (ex G-DC), 635309 (frag. ex G)], NY [00115160], P [P00559098], US [00026704]).

Distribution.—Dominican Republic.

Notes.—Urban (1912:391–392), in the protologue of *Isidorea leptantha* Urb., cited the material studied as "In Santo Domingo prope Barahona 200 m., m. aug. flor. et fruct.: Fuertes n. 634" without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. The BR specimen with barcode 000000531699 has a label with the heading "H. von Türkheim: Plantae Dominicensis—Herb. Krug et Urban." On the label there is the annotation "634. Isidorea (n. sp.?) handwritten by Pater Fuertes, and "leptantha Urb. n. sp." handwritten by Urban. The specimen consists of two branches with numerous leaves and several flowers in anthesis. In the envelope affixed on the sheet is included one dehisced capsule. This specimen is here designated as the lectotype of *I. leptantha*.

7. Isidorea oblanceolata (Urb.) Aiello, J. Arnold Arbor. 60:115. 1979. *Portlandia oblanceolata* Urb., Symb. Antill. 9:136. 1923. TYPE: CUBA. ORIENTE: Sierra de Nipe, ad viam Bio dictam, 27 Apr 1919, *E.L. Ekman 9588* (LECTOTYPE (Aiello 1979:114): S [No. S-R-5216]; ISOLECTOTYPES: F [No. 604819], NY [00126758 (one leaf)]).

Distribution.—Cuba (Holguín: Sierra de Nipe).

Notes.—Urban (1923a:136–137), in the protologue of *Portlandia oblanceolata* Urb., cited the material studied as "Prov. Oriente in Sierra de Nipe ad viam Bio dictam in charrascales, m. April. fruct.: [Ekman] 9588" without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. The specimen in S with accession number S-R-5216 has a label with the annotation "Portlandia oblanceolata Urb. (typus)" handwritten by Urban. It consists of three branches with numerous narrowly oblanceolate leaves and a few capsules. This specimen was designated as the lectotype of this name by Aiello (1979:114).

8. Isidorea ophiticola (Borhidi) Borhidi & Moncada, Acta Bot. Acad. Sci. Hung. 26:267, fig. 2 (photo of holotype). 1981 ["1980"]. *Portlandia ophiticola* Borhidi, Növennyrendsz. Novényföldr Tanz., Eötvös Lórand Tudományegyet. Budapest 5:34. 1977. TYPE: CUBA. ORIENTE [HOLGUÍN]: Sierra de Nipe, charrascal de la Cueva, Pinares de Mayarí, 27–31 May 1960, *M. López Figueiras 1037* (HOLOTYPE: HAC [ex SV]; ISOTYPE: HAJB [HAJB G 000797, ex SV]).

Distribution.—Cuba (Holguín: Sierra de Nipe).

9. Isidorea pedicellaris Urb. & Ekman, Ark. Bot. 21A:65. 1928 ["1927"]. TYPE: HAITI: Montagnes de Terre-Neuve in faucibus Morne Descouflet, 800 m, 9 Oct 1925, *E.L. Ekman H-5046* (**LECTOTYPE, here designated:** S [S-R-3049]).

Distribution.—Haiti, Dominican Republic.

Notes.—Urban and Ekman (in Urban, 1928a ["1927"]:65–66), in the protologue of *Isidorea pedicellaris* Urb. & Ekman, cited the type as "Peninsula septentr.-occid., Montagnes de Terre-Neuve in faucibus Morne Descouflet solo molli-calcareo cr. 800 m alt , m. Oct. fl. et fruct.: [Ekman] H 5046 (typus), […]," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. A specimen in S, with accession number S-R-3049, has a label with the annotation "Portlandia pedicellaris Urb. et Ekm. (typus)" handwritten by Urban. The specimen consists of three branches with numerous ovate leaves and a few flowers, and is here designated as the lectotype of this name.

10. Isidorea polyneura (Urb.) Aiello, J. Arnold Arbor. 60:115. 1979. *Portlandia polyneura* Urb., Symb. Antill. 9:135. 1923. TYPE: CUBA. GUANTÁNAMO: Bayate, in Monte Picote, in rupibus umbrosis calcareis, 550 m, 16 Jul 1916, *E.L. Ekman 7403* (LECTOTYPE (Aiello 1979:114): S [No. S-R-5217]; ISOLECTOTYPES: F [No. 604818], NY [01326438]).

Distribution.—Cuba (Holguín, Santiago de Cuba).

Notes.—Urban (1923a:135), in the protologue of *Portlandia polyneura* Urb., cited the type as "Prov. Oriente prope Bayate in monte Picote in rupibus umbrosis calcareis cr. 550 m. alt., m. Mart., Jul. fruct.: [Ekman] n. 7403 (typus), […]," without citing the herbarium of deposit. The original material studied by Urban in B was destroyed during WWII. Aiello (1979:115) designated as lectotype the specimen *Ekman 7403* in S. In S there is a sole specimen of *Ekman 7403*, with accession number S-R-5217, which has a label with the annotation "Portlandia polyneura Urb. (typus)" handwritten by Urban. It consists of two branches with several leaves, one of them with a capsule. This is the specimen designated as lectotype by Aiello.

Portlandia acunae Borhidi, Növennyrendsz. Novényföldr Tanz., Eötvös Lórand Tudományegyet. Budapest 5:35. 1977. *Isidorea acunae* (Borhidi) Borhidi & Moncada, Acta Bot. Acad. Sci. Hung. 26:266. 1980, **syn. nov.** TYPE: CUBA. SANTIAGO DE CUBA: Alto Songo, 10 Jan 1960, *Bro. Alain [Liogier], J. Acuña & M. Lópes Figueiras 7381* (HOLOTYPE: HAC [ex LS]; ISOTYPES: HAC [ex EEAB], HAJB [HAJB G 000796]).

Notes.—Borhidi (1977:35), in the protologue of *Portlandia acunae* Borhidi, wrote that the holotype of this name was in LS and the isotype in SV. Both specimens are now at HAC. The holotype specimen has a label with the heading "Herbario de La Salle" (LS), and the isotype specimen has a label with the heading "Estacion Experimental Agronomica—Herbario Ch. F. Barker" (EEAB).

11. Isidorea pungens (Lam.) B.L. Robins., Proc. Amer. Acad. Arts 45:401. 1910. *Ernodea pungens* Lam., Tabl. Encycl. 1:276. 1792 ["1791"]. TYPE: [HAITI]: "Tropical America," s.d., *Collector Unknown s.n.* (HOLOTYPE: P-LA [P00308628]).

Distribution.—Haiti, Dominican Republic.

Notes.—Lamarck (1792:276) in the protologue of *Ernodea pungens* Lam. cited the material studied as "L'Amer. mér. *Comm. par M. de Jussieu*" without citing the herbarium of deposit. In P-LA there is a specimen, barcode P00308628, with several labels. The label on the bottom left corner has the annotation "du genre ernodea Swartz. Richard dit que le Sarissus de Gaertner est du meme genre." [of the genus *Ernodea* Swartz. Richards says that *Sarissus* of Gaertner belongs to the same genus]. Just above that label is affixed another label with the handwritten annotations "Isidorea amoena Richard (Achille) Tab. 15. fig. 1. Ernodea pedunculata Poir. Ernodea pungens Lam.!" The specimen consists of a small branch with numerous pungent leaves, and one flower with lanceolate calyx lobes and only the base of the corolla (the distal portion has either been eaten by insects or broken off). This specimen is the holotype of *E. pungens*.

Isidorea amoena A. Rich. ex DC., Prodr. 4:406. 1830, *nom. superfl.* Type: DOMINICAN REPUBLIC: without locality, s.d. [1819–1820], *C. Bertero s.n.* (**LECTOTYPE, here designated:** G-DC [G00666683]).

Notes.—Candolle (1830:406) published the name of this species as "Isidorea amoena (Rich. l.c.) in insula Caribaeis. Ernodea pedunculata Poir. suppl. 2. p. 581? et Ernodea pungens Lam. ill. 1. p. 276? ex Rich. sed utriusque descr. non convenit. (v.s.)." In G-DC there is a specimen, barcode G00666683, which has a label affixed on the bottom right corner with the annotations "Ernodea pungens Lam. Isidorea amoena Rich." handwritten by Candolle. The specimen consists of a sterile branch with numerous pungent leaves. On the bottom of the branch is pinned a label with the annotations "Rubiacea. St. Dom. Bertero. M. Balbis 1821." This specimen is here designated as the lectotype of *Isidorea amoena* A. Rich. ex DC.

The epithet "pungens" was available for this species, which is what Candolle should have used to make a new combination. The correct new combination was later published by B.L. Robinson (1910:401).

12. Isidorea tetramera Urb. & Ekm., Ark. Bot. 21A:66. 1928 ["1927"]. TYPE: HAITI: Île de la Tortue, coastal rocks at Boucan Guêpe, 22 May 1925, *E.L. Ekman H-4086* (**LECTOTYPE, here designated:** S [S-R-3050]).

***Distribution.*—**Haiti, Dominican Republic.

***Notes.*—**Urban and Ekman (in Urban, 1928a ["1927"]:66–67), in the protologue of *Isidorea tetramera* Urb. & Ekman, cited the material studied as "Insula la Tortue ad Boucan Guêpe in scopulosis litoralibus dure calcareis, m. Majo fruct.: [Ekman] n. 4886," without citing the herbarium of deposit. The original material in B studied by them was destroyed during WWII. In S there is a specimen, with accession number S-R-3050, which has a label with the annotation "Isidorea tetramera Urb. et Ekm. (typus)" handwritten by Urban. It consists of a single branch with numerous, dense leaves. No flower or capsule is visible on the branch. In the envelope affixed on the sheet are included numerous leaves and a few dehisced capsules. This specimen is here designated as the lectotype of this name.

13. Isidorea veris Ekman ex Aiello & Borhidi, Acta Bot. Hung. 32:222. 1986. TYPE: DOMINICAN REPUBLIC. SAMANÁ: Cordillera Central, Los Haitises, Boca del Inferno, limestone crags, rather common but few flowers, 25 Jul 1930, *E.L. Ekman 15431* (HOLOTYPE: S [No. S07-14397]; ISOTYPES: A [without barcode], CAS [0003006], G [G00436334], K [K000173486], LL [00000279], NY, S [S07-14402]).

***Distribution.*—**Dominican Republic.

ISIDOREA EXCLUDED TAXA

Isidorea cubensis Standl., N. Amer. Fl. 32:15. 1918.
= *Schmidtottia cubensis* (Standl.) Urb. (See below).

LORENCEA

Standley (1928:162) described *Portlandia guatemalensis* Standl., and stated that "Most species of *Portlandia* are West Indian. Two are known from Mexico. This is the first species to be reported from Central America. It is not very closely related to any other species of the genus." Lorence (1986:210) transferred this species to *Coutaportla*, with the new combination *Coutaportla guatemalensis* (Standl.) Lorence, based on overall similarity with *Coutaportla ghiesbreghtiana* (Baill.) Urb. Borhidi (2003) transferred *P. guatemalensis* to the new genus *Lorencea* Borhidi, and differentiated *L. guatemalensis* (Standl.) Borhidi from *Coutaportla ghiesbreghtiana* and *C. pailensis* Villareal, by being a tree 9–19 m tall (vs. shrub 1–3 m tall in *Coutaportla*), leaf blades 11–22 × 3–9 cm, chartaceous, with 7–9 secondary veins on each side (vs. 0.4–5 × 0.2–1.8 cm, coriaceous, with 2–5 secondary veins on each side), flowers (4)5-merous (vs. 4-merous), corollas 2.5–3.5 cm long (vs. 1–2.5 cm long), placenta basal, vertical, linear (vs. central, horizontal, quadrangular), capsules 10–14 × 12–16 mm (vs. 4–10 × 3–7 mm), and seeds 6–8 mm long (vs. 2–3.5 mm long).

In Paudyal et al's (2018) molecular phylogenetic tree, *Coutaportla* and *Lorencea*, genera endemic to Mexico and northern Central America, were found on a strongly supported clade, sister to the remainder of the Chiococceae. Their phylogenetic analyses using the combined dataset placed *Coutaportla* and *Lorencea* on one clade with relatively good support; however, these two genera were not positioned on a single clade in the analyses using only plastid data. The molecular phylogenies of Motley et al. (2005) also placed *Coutaportla* sister to all the other genera, although with relatively weak support. These phylogenetic relationships suggest that *Coutaportla* and *Lorencea* are part of a deeply diverging lineage that formed a sister relationship with the rest of Chiococceae and support the indication of Manns et al. (2012) that Chiococceae were distributed from southern Mexico and northern Central America, as the center of origin of the tribe, to the Caribbean islands and to South America. In conclusion, Paudyal et al's (2018) analyses supported the segregation of *Lorencea*. *Lorencea* is here treated as a monotypic genus of tall trees occurring in lowland forests of southern Mexico and Guatemala.

Lorencea Borhidi, Acta Bot. Hung. 45:17. 2003; Standley, J. Wash. Acad. Sci. 18:162. 1928; Lorence, Syst. Bot. 11:209–213, fig. 1–2. 1986; Borhidi, Acta Bot. Hung. 45:13–21. 2003; Ochoterena-Booth, Fl. Mesoamericana 4.2:69. 2012; Borhidi et al., Rubiáceas México 288–290, f. 59. 2006; Borhidi et al.,

Rubiáceas México, 2nd ed. 316, 317, f. 68. 2012; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018. Type: *Lorencea guatemalensis* (Standl.) Borhidi

1. Lorencea guatemalensis (Standl.) Borhidi, Acta Bot. Hung. 45:17. 2003. *Portlandia guatemalensis* Standl., J. Wash. Acad. Sci. 18:162. 1928. *Coutaportla guatemalensis* (Standl.) Lorence, Syst. Bot. 11:210, fig. 1–2. 1986. Type: GUATEMALA. Alta Verapaz: Quebrada Seca, 800 m, 1 Jun 1920, *H. Johnson 282* (holotype: US [00137328]; isotype: F [No. 707790 (frag. ex US)]).

Distribution.—Guatemala.

MOTLEYOTHAMNUS

Ruiz and Pavón (1799:49–50, pl. 190, fig. a) illustrated *Portlandia corymbosa* Ruiz & Pav , and described it as a shrub with spreading branches, with leaves present only at distal nodes, inflorescence terminal, corymbose, corolla white, 5-merous, capsules turbinate, laterally compressed, and cited the collection locality as "Andium praeruptis et imis locis calidis, inter Chaolla et Muña vicos, praesertim versus Santo Domingo." Sprengel (1825:706) transferred this species to *Exostema*, where it remained until modern treatments (e.g., Standley, 1936; Anderson, 1992; Brako & Zarucchi, 1993). Paudyal et al. (2018), in their molecular phylogenetic trees, found *E. maynense* and *E. corymbosum* on a strongly supported monophyletic group together with the Andean species of *Coutarea* (transferred to *Coutareopsis*), in a distant position from the other species traditionally attributed to *Exostema*. The Andean species of *Coutarea* and the Andean species of *Exostema* are similar in fruit and seed morphology, as their capsules are laterally compressed, with a narrow septum, and with seeds perpendicular to the septum and acrobasipetally aligned. Hence, *E. corymbosum* and *E. maynense* needed to be excluded from *Exostema*, as already demonstrated by Rova (1999). Paudyal and Delprete (in Paudyal et al. 2018) transferred *E. corymbosum* to the new genus *Motleyothamnus* Paudyal & Delprete. They dedicated the name of this genus to Timothy J. Motley (1966–2013), who collaborated in field work and supervised the molecular phylogeny project on the Chiococceae tribe, during the initial stage (Delprete 2015c).

Motleyothamnus corymbosum (Ruiz & Pav.) Paudyal & Delprete differs from *Exostema sensu* Paudyal et al. (2018) by the terminal, multiflorous inflorescences (vs. axillary, pauciflorous in *Exostema sensu* Paudyal et al. (2018), capsules obovate in outline, slightly laterally compressed (vs. obpyriform to round in outline, strongly laterally compressed), and restricted to the Andes of Peru, at 1000–2800 m elevation (vs. Cuba and Hispaniola, and *E. caribaeum* in the Antilles, Mexico, and Central America, from sea level to 900 m elevation).

Motleyothamnus is similar to *Solenandra sensu* Paudyal et al. (2018) in having terminal, multiflorous inflorescences, from which it differs in having acrobasipetal seed arrangement, trapezoidal placenta, and capsules strongly laterally compressed (vs. acropetal, centripetal or basipetal seed arrangement, hemi-ellipsoidal placenta, and capsules round in cross-section in *Solenandra*).

Motleyothamnus is a monotypic genus known from open places and shrublands of the Andes of Peru, growing on slopes, along streams, in moist and dry areas, at 1000–2800 m elevation.

Motleyothamnus Paudyal & Delprete, Bot. J. Linn. Soc. 187:386. 2018; Ruiz & Pavón, Fl. Peruv. Chil. 2:49–50, pl. 190, fig. a. 1799; Standley, Fl. Peru, Field Mus. Nat. Hist. 13:52–53. 1836; Paudyal & Delprete, Bot. J. Linn. Soc. 187:365–396. 2018. Type: *Motleyothamnus corymbosum* (Ruiz & Pav.) Paudyal & Delprete

1. Motleyothamnus corymbosum (Ruiz & Pav.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:386. 2018. *Exostema corymbosum* (Ruiz & Pav.) Spreng., Syst. Veg. 1:706. 1824 ["1825"]. *Portlandia corymbosa* Ruiz & Pav., Fl. Peruv. 2:49. 1799. Type: PERU: "Andium praeruptis et imis locis calidis, inter Chaolla et Muña vicos, praesertim versus Santo Domingo', s.d., *H. Ruiz & J.A. Pavón s.n.* (lectotype (Paudyal et al. 2018:386): MA [MA815769]; isolectotypes: MA [MA815768], MPU [MPU021289], B-W [No. 03933]; possible isolectotype, F [No. 0041030, labelled as "Ruiz & Pavón 3972"]).

Distribution.—Peru (Andes, 1000–2800 m).

Exostema peruvianum Bonpl., in Humboldt FWHA & Bonpland AJA, Pl. Aequin. 1:133, tab. 38. 1807 (as "*peruviana*"). Type: PERU: [Andes. Querocotillo]: without locality, s.d., *A.J.A. Bonpland & F.W.H.A. Humboldt 3661* (**lectotype, here designated:** P [P03947001]; isolectotypes, B-W [B –W 04027 -01 0], P [P00671150]).

Notes.—Bonpland (1807:133–135, tab. 38) in the protologue of *Exostema peruvianum* Bonpl. (as "*peruviana*"), stated that he collected the original gathering on the Andes of Peru, without citing the herbarium of deposit. In P is present an original specimen of *E. peruvianum*, with Bonpland's collection number 3661, and barcode P03947001. It has Bonpland's original field label and a

complete description of the species, handwritten by him. The specimen consists of two branches, one with an infructescence, and one with an inflorescence with flower buds. It is here designated as the lectotype of this name.

In P-Bonpl., there is another original specimen of *Exostema peruvianum*, with barcode P00671150. The specimen consists of one branch with numerous leaves and an infructescence with dehisced capsules, and two branchlets with a few leaves. This specimen is an isolectotype of this name.

In B-W there is a specimen, with barcode B –W 04027 -01 0, which has a label with the annotation "Exostema Peruviana Pl. Eq. […] (Humboldt)." On the bottom right corner of the sheet there is the annotation "Humboldt. W" handwritten by Willdenow. The specimen consists of a branch with several leaves, an inflorescences with a flower bud, and an infructescence with numerous dehisced capsules. Just above the branch is affixed a flower in anthesis. Because Bonpland collected this specimen and is the author of the name, this specimen is a second isolectotype of *E. peruvianum*.

Exostema bicolor Poepp., Nov. Gen. Sp. Pl. 3:32. 1841. Type: PERU. Huánuco: Cerro de San Cristóbal, near Cuchero, in rocky windswept sites, 1829, *E.F. Poeppig Diar. 1352* (**LECTOTYPE, here designated:** W [No. W 0049011]; possible isolectotype: GOET [GOET010234]; isotype fragment: F [No. 776569]).

Notes.—Poeppig (1841:32), in the protologue of *Exostema bicolor* Poepp., cited his own collection as "Crescit in scopulosis ventosis Peruviae transandinae, in monte Cerro San Cristobal juxta Cuchero. Septembre florebat" without indicating the herbarium of deposit. According to Stafleu and Cowan (1983:310), Poeppig's herbarium and types are at W, with duplicates in many herbaria. In W there is a specimen, with accession number W 0049011, that has a label with the annotation "Diar. 1352, Cuchero Peruvia 1829" handwritten by Poeppig. On the same label there is also the annotation "Hb. Endl." handwritten by an unknown author. This specimen, consisting of a branch with numerous leaves and several inflorescences with flower buds, is here designated as the lectotype of *E. bicolor*.

In GOET there is a specimen with barcode GOET010234, which has a label with the annotation "1. Exostemma peruvianum Humb. et Bonpl. In Peruvia orient. ad Huallagam superiorem leg. Poeppig Diar. n. 1352, May 1839" handwritten by an unknown author. The collection locality and date do not correspond to the locality described by Poeppig. However, the annotation "Poeppig Diar. n. 1352" is the same of the W specimen. This specimen consists of a branch with a few leaves and two inflorescences with flower buds, and it corresponds entirely with the W 0049011 specimen. Hence, it is a possible isolectotype of *E. bicolor*.

NERNSTIA

Candolle (1830:350) published *Coutarea mexicana* Zucc. & Mart. ex DC., and described it as "foliis utrique glabris, pedunculis 1-floris bibracteolatis, corollis infundibulariformis, lobis obtusissimis. Mexico." [Leaves glabrous, peduncle with 1 flower, subtended by two bracteoles, corolla infundibular, lobes broadly obtuse. Mexico]. Urban (1923a:146) transferred this species to *Nernstia* Urb, proposing the new combination *N. mexicana* (Zucc. & Mart. ex DC.) Urb. Urban dedicated the genus name to the German chemist Walter Nernst (1864–1941), who won the Nobel Prize in Chemistry in 1920. Aiello (1979) apparently overlooked the genus *Nernstia* previously published by Urban, and published the superfluous generic name *Cigarilla*. Paudyal et al. (2018), in their molecular phylogenetic study, retrieved *Nernstia* and *Osa*, on a strongly supported clade, sister to the *Catesbaea-Portlandia-Isidorea* clade. *Nernstia* is similar to *Osa* by the axillary, 1-flowered inflorescences, 5-merous flowers, and linear anthers. *Nerstia* differs from *Osa* by being shrubs to 5 m tall, endemic to limestone areas (vs. shrubs or trees to 15 m tall, endemic to tall forest, on rich soil, in *Osa*), with leaves 3–7.5 cm long, coriaceous, with revolute margins, (vs. 16.5–23.5 cm long, membranaceous to chartaceous, with planar margins), corollas campanulate, 6–8 cm long (vs. trumpet-shaped, 30–35 cm long), capsules ovoid-obovoid, 1.3–1.8 cm long (vs. ellipsoid, 3.2–3.4 cm long), and by being endemic to Costa Rica and Panama (vs. endemic to central Mexico, states of Hidalgo and San Luís Potosí).

Nernstia differs from *Portlandia* by its colliculate seeds (vs. tuberculate) with acropetally imbricate arrangement, non-persistent funicle (vs. persistent), and large, spongy placenta (vs. linear, adnate to the septum). *Nerstia* is a monospecific genus endemic to central Mexico.

Nernstia Urb , Symb. Antill. 9:145. 1923; Candolle, Prodr. 4:350. 1830; Aiello, J. Arnold Arbor. 60:109–111 (as *Nernstia*). 1979; Borhidi et al , Rubiáceas México 306–307, f. 65. 2006; Borhidi et al., Rubiáceas México, 2nd ed. 352, f. 77. 2012; Paudyal & Delprete, Bot. J. Linn. Soc. 187:365–396. 2018. TYPE: *Nernstia mexicana* Urb.

Cigarilla Aiello, J. Arnold Arbor. 60:109. 1979. TYPE: *Cigarilla mexicana* (Zucc. & Mart. ex DC.) Aiello, J. Arnold Arbor. 60:109. 1979. (= *Nernstia mexicana*).

1. Nernstia mexicana (Zucc. & Mart. ex DC.) Urb., Symb. Antill. 9:146. 1923. *Coutarea mexicana* Zucc. & Mart. ex DC., Prodr. 4:350. 1830. *Cigarilla mexicana* (Zucc. & Mart. ex DC.) Aiello, J. Arnold Arbor. 60:109. 1979. TYPE: MEXICO: without locality, s.d., *Collector Unknown s.n.* [Communicated by Martius in 1829] (HOLOTYPE: G-DC [G00665779]).

Distribution.—Mexico (Hidalgo, San Luis Potosí).

Notes.—Candolle (1830:350) attributed the name *Coutarea mexicana* Zucc. & Mart. ex DC. to an unpublished manuscript of Zuccarini and Martius, and indicated the collection locality as "Mexico. (v.s.)." The expression "(v. s.)" means that he saw a herbarium specimen.

Aiello (1979:110) cited the type of *Coutarea mexicana* as "Type: Mexico, without further locality, Martius in 1829 (holotype, G-DC, Microfiche, IDC 800. 680: II.7!)." The G-DC specimen cited by Aiello has barcode G00665779. On the bottom right corner of the sheet is affixed a label with the annotation "Coutarea mexicana Zucc." handwritten by Candolle. The specimen consists of a small branch with a few leaves, a flower bud, and a flower in anthesis. In the attached envelope are included four leaves. At the base of the branch is pinned a label with the annotations "Coutarea mexicana Zuccar. M. Martius 1829. Mexico" handwritten by an unknown author. The date "1829" corresponds to the year when Martius sent the specimen to Candolle, and the collector and collection date of this specimen are unknown. This specimen is the holotype of *C. mexicana*.

OSA

Simpson (1974:277) published *Hintonia pulchra* D.R. Simpson, and described it as a tree 15 m tall, with 5-merous flowers, axillary, in pairs at each node (one in each leaf axil), calyx lobes linear or filiform, corollas white, trumpet-shaped, 27 cm long, 11 cm wide at mouth, stamens included, style as long as the stamens, undivided, fruit capsular, and seeds flattened, not winged, ca. 6 mm long, 1.5–2.5 mm thick. Aiello (1979) transferred *H. pulchra* to the new genus *Osa* Aiello, dedicating the generic name to the Osa Peninsula, Costa Rica, where it is endemic. Aiello differentiated *Osa* from *Hintonia* by the large, wingless seeds (vs. small winged seeds) with tuberculate testa (vs. reticulate) and persistent funicle (vs. non-persistent), long trumpet-shaped corollas (vs. funnelform), and large leaves with attenuate apex (vs. medium-sized leaves with acute to acuminate apex). Paudyal et al. (2018), in their molecular phylogenies, found the two monospecific *Nernstia* (from Mexico) and *Osa* (from Costa Rica) on a strongly supported clade, sister to the *Catesbaea–Portlandia-Isidorea* clade, supporting the close relationship of these two genera. Hodel and Hannon (2024) dedicated an amply illustrated article on the morphology and cultural techniques of *Osa pulchra*.

Osa Aiello, J. Arnorld Arbor. 60:115. 1979; Simpson, Phytologia 29(4):277–279, f. 1. 1974; Aiello, J. Arnold Arbor. 60:115–116. 1979; Ochoterena-Booth, in Davidse et al., Fl. Mesoamericana 4.2:163. 2012; Paudyal & Delprete, Bot. J. Linn. Soc. 187:365–396. 2018; Hodel & Hannon, Palmarbor 8:1–40. 2024. TYPE: *Osa pulchra* (D.R. Simpson) Aiello.

1. Osa pulchra (D.R. Simpson) Aiello, J. Arnorld Arbor. 60:116. 1979. *Hintonia pulchra* D. Simpson, Phytologia 29(4):277, fig. 1. 1974. TYPE: COSTA RICA. Puntarenas: Osa Peninsula, ca. 5 km W of Rincón de Osa, areas of secondary vegetation N and W of air field, 50–60 m, 8°42′N, 83°31′W, 9–12 Jan 1970, *W.C. Burger & R.L. Liesner 7320* (HOLOTYPE: F [No. 1729029]; ISOTYPES: MO [No. 2262984, barcode MO-2532201], U [U 0006042]).

Distribution.—Costa Rica (Peninsula de Osa), Panama.

PHIALANTHUS

Grisebach (1861:335) published the genus *Phialanthus* Griseb., with the single species *P. myrtilloides* Griseb., without explaining the etymology of the name. From the Greek, phialé- (φιάλη), meaning vial, small glass container, and -anthos (ἄνθος) meaning flower, referring to the general shape of the flower. Correll and Correll (1982:1408) explained the etymology of the genus name as "Greek for "urn-flower." Grisebach (1861:335) described *Phialanthus* as a viscid shrub, with shortly campanulate-infundibular, 4-lobed corollas, exserted stamens, style simple with blunt style lobes, 2-celled drupe, and cylindrical seeds. In addition, he stated that "the character, though not yet quite complete, shows this genus to be nearly related to *Scolosanthus*,

while from its resinous excretions *Stenostomum*, sect. *Laugeria*, is analogous." *Phialanthus* has been included into the Chiococceae by most Rubiaceae specialists (e.g., Hooker 1873a, Bremer 1992; Robbrecht 1988, 1994; Delprete 1996). Bremer (1992) in an analysis using molecular and morphological data, excluded it from the Chiococceae due to the presence of free filaments. Rova et al. (2002) showed that it is closely related to several members of Chiococceae. Motley et al. (2005), in a phylogenetic analysis of the Chiococceae using molecular data, *Phialanthus* was supported as monophyletic. Paudyal et al. (2018) included nine *Phialanthus* species in their molecular phylogenetic study, and in both combined and separate analyses, it was retrieved as non-monophyletic. Eight species of *Phialanthus* were found on a strongly supported clade, and *P. hispaniolae* Alain & R.G. García at a basal position of the clade, next to *Eosanthe*. *Phialanthus* has never been subject of monographic revision. In the present treatment, 22 species are recognized in this genus, most of them endemic to Cuba, with some species occurring in the Bahamas, and in the Greater and Lesser Antilles.

Phialanthus Griseb., Fl. Brit. W. I.:335. 1861; Standley, North Amer. Flora 32(4):281–284. 1934; Liogier, Fl. Cuba 5:90–92. 1962; Correll & Correll, Fl. Bahama Arch. 1408–1410, f. 616. 1982; Borhidi, Acta Bot. Hung. 29:194–205. 1983; Liogier, Fl. Española 7:357, 359. 1995; Borhidi et al., Rubiáceas Cuba 250–260. 2017. Type: *Phialanthus myrtilloides* Griseb.

1. Phialanthus acunae Borhidi, Acta Bot. Hung. 29:196, fig. 2. 1983. Type: CUBA. Holguín: Cananova, Camino de Centeno, Jul 1949, *Bro. Alain [A.H. Liogier] & Bro. Clemente 975* [as "*Clemente, Alain & Crisógone 975*"] (holotype: HAC; isotypes: BP n.v., GH [00257260], HAJB n.v., NY [02200749], US [00902069]).

Distribution.—Cuba (Holguín, Guantánamo).

2. Phialanthus alainii Borhidi, Acta Bot. Hung. 50:278. 2008. Type: CUBA. Guantánamo: Toa, Magdalena, Peña Prieta, serpentine barrens, 700 m, 30 Jul 1952, *Bro. Alain [Liogier] 3471* (holotype: HAC n.v. [ex LS]; isotypes: GH [00257527], HAC n.v., NY [02200761], US [00955899]).

Distribution.—Cuba (Guantánamo).

3. Phialanthus bissei (Borhidi) Borhidi, Acta Bot. Hung. 51:277. 2009. *Phialanthus rigidus* ssp. *bissei* Borhidi, Acta Bot. Hung. 38:168. 1994. Type: CUBA. Isla de Pinos: Camino entre Cayo Piedras y Punta del Este, sobre caliza, 24 Jul 1971, *J. Bisse s.n. HFC No. 19844* (holotype: HAJB n.v.; isotypes: BP n.v., HAC, JE [JE00001228]).

Distribution.—Cuba (Isla de la Juventud).

Notes.—As a result of a detailed search in HAJB, no original material *Phialanthus rigidus* ssp. *bissei* Borhidi was found. The HAJB curator, Eldis R. Béquer (pers. comm.), is not aware of the possible location of the holotype specimen of this name. He confirmed that all the HAJB Rubiaceae specimens that where on loan to JPU, to be studied by Attila Borhidi, were returned to HAJB.

4. Phialanthus ellipticus Urb , Symb. Antill. 9:161. 1923. Type: CUBA. Holguín: Río Piloto, in charrascales, 1 Sep 1914, *E.L. Ekman 2716* (**lectotype, here designated:** S [No. S-07-14888]).

Distribution.—Cuba (Holguín: Sierra de Nipe, Río Piloto).

Notes.—Urban (1923a:161–162), in the protologue of *Phialanthus ellipticus* Urb., cited the gathering "Prov. Oriente prope Rio Piloto in charrascales, m. Sept. flor.: [Ekman] n. 2716," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. Borhidi (2017:252) cited the type of *Phialanthus ellipticus* as "Cuba. Oriente prope Río Piloto, […], *Ekman 2716* Holotipo: B†. Lectotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017) lectotype designation is not valid. The specimen in S, with accession number S-07-14888, has a label with the annotation "Phialanthus ellipticus Urb. (typus)" handwritten by Urban. The specimen consists of several branches with numerous leaves, and several small flowers present among the leaves. This specimen is here designated as the lectotype of this name.

5. Phialanthus glaberrimus Borhidi, Acta Bot. Hung. 29:194. 1983. Type: CUBA. Guantánamo: Baracoa, Loma de Buena Vista, 500–600 m, 12 Aug 1975, *A. Álvarez, J. Bisse & K.F. Meyer HFC No. 27393* (**lectotype, here designated:** HAJB [HAJB G 000749]; isolectotypes: B [B 10 0385019], HAJB [3 sheets, HAJB G 000750, HAJB G 000751, HAJB G 000752], JE [JE00001214]).

Distribution.—Cuba (Guantánamo).

Notes.—Borhidi (1983:194), in the protologue of *Phialanthus glaberrimus* Borhidi, cited the type of this name as "Holotypus: HAJB 27393. Baracoa: Loma de Buena Vista 500–600 m.s.m., Leg. Alvarez, Bisse, Meyer 12.8.1975." The number "27393" pertains to the series *Herbario de la Flora de Cuba* (*HFC*), which was used by the collectors that participated in the Project *Flora de Cuba*, an international convention between the University of La Habana, Cuba, the Friedrich Schiller University in Jena, Germany, and the Humboldt University in Berlin, Germany (Regalado Gabancho et al. 2008). All the duplicates of this gathering were distributed as HFC No. 27393. In HAJB there are four specimens of this gathering, all of them with the typewritten annotation "Phialanthus glaberrimus Borhidi. sp. nov." The specimen with barcode HAJB G 000749 is here designated as the lectotype of this name.

6. Phialanthus grandifolius Alain, Bull. Torrey Bot. Club 92(4):302. 1965. TYPE: PUERTO RICO: Maricao State Forest, serpentine barrens, 800 m, 26 Jun 1963, *A.H. Liogier [Bro. Alain] 9717* (**LECTOTYPE, here designated:** NY [02200755]; ISOLECTOTYPES: DUKE [10000654], GH [00094964], IJ n.v., US [00138506]).

Distribution.—Puerto Rico.

Notes.—Liogier (1965:302), in the protologue of *Phialanthus grandifolius* Alain, cited the type as "PUERTO RICO. Serpentine barrens, Maricao State Forest, alt. 800 m, June 26, 1963, Alain 9717 (NY, GH, IJ, US)." He did not specify which of those specimens is the holotype. The specimen in NY, barcode 02200755, is here designated as the lectotype of this name.

7. Phialanthus guantanamensis Borhidi, Acta Bot. Hung. 29:195. 1983. TYPE: CUBA. GUANTÁNAMO: monte seco sobre diente de perro, en la subida a Monte Cristi, 300 m, Jun 1967, *J. Bisse & L. Rojas HFC No. 3517* (HOLOTYPE: HAJB [HAJB G 000753]; ISOTYPE: JE [JE00004986 (*HFC No. 0035517*)]).

Distribution.—Cuba (Guantánamo).

8. Phialanthus hispaniolae Alain & R.G. García, Moscosoa 8:8, fig. 2. 1994. TYPE: DOMINICAN REPUBLIC. INDEPENDENCIA: Sierra de Bahoruco, S de Duvergé, en el Firme La Cañita, al S de Monte Palma, 18°17′N, 71°30′W, 700–750 m, 3 Dec 1993, *R. Garcia, G. Caminero, D. Höner & T. Montilla 5288* (HOLOTYPE: UPR n.v.; ISOTYPES: B [B 10 0413571], F [No. 2226303], JBSD n.v., NY n.v. [probably not there], USD n.v.).

Distribution.—Dominican Republic (Sierra de Bahoruco).

9. Phialanthus inflatus Borhidi, Acta Bot. Hung. 29:195. 1983. TYPE: CUBA. GUANTÁNAMO: Baracoa, charrascales cerca de la desembocadura de Arroyo Maguana, Feb 1968, *J. Bisse & E. Köhler HFC No. 5756* (HOLOTYPE: HAJB [HAJB G 000754]; ISOTYPE: JE [JE00001205 (HFC No. 005756)]).

Distribution.—Cuba (Guantánamo: Baracoa).

10. Phialanthus jamaicensis Urb., Symb. Antill. 5:515. 1908. TYPE: JAMAICA: road to Wareka, 10 Oct 1905, *W. Harris 9023* (**LECTOTYPE, here designated:** F [No. 189197]; isolectotypes, A [00094965], C [without barcode], NY [2 sheets, 02200756, 02200757], RSA [RSA0005812], US [0013507]).

Distribution.—Jamaica.

Notes.—Urban (1908:515), in the protologue of *Phialanthus jamaicensis* Urb., cited two gatherings as follows: "Jamaica. Juxta viam ad Wareka, 260 m. alt., m. Oct. florifer: Harris n. 9023, in Long Mountain ad latus australe, 300 m. alt., m. Jun. fl.: Harris 9587," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. There is a specimen in F, with accession number 189197, that has a label with the heading "Herbarium Krug et Urban" and the annotation "9023. Phialanthus jamaicensis Urb. (typus)" handwritten by Urban. The specimen consists of a branch with numerous leaves and a few inflorescences with some flowers in anthesis. This specimen is here designated as the lectotype of *P. jamaicensis*.

11. Phialanthus linearis Alain, Contr. Ocas. Mus. Hist. Nat. La Salle 17:7. 1959. TYPE: CUBA. HOLGUÍN: Moa, Cuabales de Playa la Vaca, 9 Nov 1945, *J. Acuña 13369* (HOLOTYPE: HAC [ex SV] (**Fig. 3**); ISOTYPE: HAJB [HAJB G 000755, ex LS]).

Distribution.—Cuba (Holguín: Moa).

12. Phialanthus macrocalyx Borhidi, Acta Bot. Hung. 29:195. 1983. TYPE: CUBA. HOLGUÍN: Moa, Sierra de Moa, Charrascal del Cayo Coco, 200–300 m, 13 Aug 1970, *J. Bisse & H. Lippold HFC No. 17596* (HOLOTYPE: HAJB [HAJB G 000756]).

Distribution.—Cuba (Holguín: Moa).

Fig. 3. Holotype of *Phialanthus linearis* Alain (*Acuña 13369*, HAC [ex SV]). Reproduced with permission by the Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana, Cuba.

13. Phialanthus macrostemon Standl., Contr. U.S. Natl. Herb. 20:209. 1919. TYPE: CUBA. GUANTÁNAMO: Pinar de El Purio, Cabonico, 15 Sep 1917, *J.T. Roig 143* (HOLOTYPE: NY [02200762]; ISOTYPE: HAC).

Distribution.—Cuba (Guantánamo: Baracoa; Holguín: Mayari).

Notes.—Standley (1919:209) in the protologue of *Phialanthus macrostemon* Standl., stated that the holotype is the specimen *Roig 143* deposited at NY. Borhidi (2017:256) erroneously stated the holotype of this name is at US.

14. Phialanthus marianus Borhidi, Acta Bot. Hung. 29:196. 1983. TYPE: CUBA. GUANTÁNAMO: San Antonio del Sur, Abra Mariana, loma al oeste del barranco, 6 Feb 1978, *J. Bisse, M.A. Diaz, L. Gonzalez & G. Stohr HFC No. 36587* (HOLOTYPE: HAJB [HAJB G 000757]; ISOTYPES: B [B 10 0385020], HAC n.v., JE n.v.).

Distribution.—Cuba (Guantánamo: Abra Mariana).

15. Phialanthus myrtilloides Griseb., Fl. Brit. W. Ind.:335. 1861 ["1864"]. TYPE: BAHAMAS: without locality, s.d., *I. Swainson* (**LECTOTYPE, here designated:** K [K000432643]; ISOLECTOTYPE: GOET [GOET010423]).

Distribution.—Southern USA (Florida), Bahama Archipelago, Turks & Caicos, Jamaica, and Cuba (Camaguey, Pinar del Río, Ciego del Avila).

Notes.—Grisebach (1861:335), in the protologue of *Phialanthus myrtilloides* Griseb , cited the material studied as "[…] The drupe is unripe, but a sketch (in Herb. Hook.) shows a structure analogous to that of *Stenostomum*.—Hab. *Bahamas*! Swains." He did not indicate the herbarium of deposit of the material examined. According to Stafleu and Cowan (1976:1007), Grisebach's "Herbarium at GOET, containing most of his types. Since Grisebach also consulted borrowed material, some of his types are elsewhere (e.g., C). Many of his types of the *Flora of British West Indian Islands* are at K."

Borhidi (2017:256) cited the type of *Phialanthus myrtilloides* as "Tipo: Bahamas, *Swainson*, s.n. (BM)." According to the *Code*, (Turland et al. 2018), starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al. (2017) type citation cannot be treated as an inadvertent lectotypification.

In GOET there is a specimen, with barcode GOET010423, which has a label with the annotation "Phialanthus myrtilloides m. Bahamas. Swainson" handwritten by Grisebach. On the sheet is attached a small envelope containing a minute distal portion of a stem with a few leaves, and a minute portion of a stem with a few flowers in anthesis. Most likely, those are portions extracted from another more complete specimen.

In K there is a specimen, with barcode K000432643, which has a label with the annotation "Phialanthus myrtilloides Gr." handwritten by Grisebach. Near the right margin of the sheet it is handwritten "Bahamas" by an unknown author. The specimen consists of three branches with numerous leaves, and numerous flowers in anthesis. Because this specimen is annotated by Grisebach and consists of ample material, it is here designated as the lectotype of *Phialanthus myrtilloides*.

16. Phialanthus oblongatus Urb., Symb. Antill. 9:161. 1923. TYPE: CUBA. HOLGUÍN: El Paraíso, solo eruptivo, in charrascales, 27 Aug 1916, *E.L. Ekman 7621* (**LECTOTYPE, here designated:** S [No. S07-14887]).

Distribution.—Cuba (Holguín: Sierra de Nipe).

Notes.—Urban (1923a:161), in the protologue of *Phialanthus oblongatus* Urb., cited the material studied as "Prov. Oriente prope Holguín ad El Paraiso solo eruptivo in charrascales, m. Aug. flor.: [Ekman] n. 7621," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. Borhidi (2017:257) cited the type of *P. oblongatus* as "Tipo: Cuba: Oriente prope Holguín, […], *Ekman 7621*, Holotipo: B†. Lectotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017) type citation is not a valid lectotypification.

In S there is a specimen, with accession number S07-14887, which has a label with the annotation "Phialanthus oblongatus Urb. (typus)" handwritten by Urban. The specimen consists of two branches with numerous dense leaves, and several axillary flowers in anthesis. This specimen is here designated as the lectotype of this name.

17. Phialanthus parvifolius Urb., Symb. Antill. 9:160. 1923. TYPE: CUBA. GUANTÁNAMO: Baracoa, ad Río Yoa, in charrascales valde communis, 28 Nov 1914, *E.L. Ekman 3680* (**LECTOTYPE, here designated:** S [S07-14889]; ISOLECTOTYPE: G [G00436461]).

Distribution.—Cuba (Guantánamo: Baracoa).

Notes.—Urban (1923a:160–161), in the protologue of *Phialanthus parvifolius* Urb., cited the material studied as "Prov. Oriente prope Baracoa ad Rio Yoa in charrascales valde communis, m. Nov. flor.: [Ekman] n. 3680," without citing the herbarium of deposit. The original material studied by Urban in B was destroyed during WWII. Borhidi (2017:257) cited the type of *Phialanthus parvifolius* as "Tipo: Cuba, Oriente prope Baracoa, […], *Ekman 3680*, Holotipo: B†. Lectotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017) lectotype designation is not valid.

In S there is a specimens, with accession number S07-14889, which has a label with the annotation "Phialanthus parvifolius Urb. (typus)" handwritten by Urban. The specimen consists of two branches with numerous, dense leaves, and several axillary flowers in anthesis. This specimen is here designated as the lectotype of this name.

18. Phialanthus peduncularis Borhidi, Acta Bot. Hung. 38:167. "1993–94" [1995]. TYPE: CUBA. HOLGUÍN: Sierra del Cristal, Río Lebisa, 26 Aug 1959, *M. López Figueiras 201* (HOLOTYPE: HAC [ex LS]).

Distribution.—Cuba (Holguín: Sierra del Cristal).

19. Phialanthus resinifluus Griseb., Cat. Pl. Cub. 140. 1866. TYPE: CUBA. ORIENTE [HOLGUÍN or GUANTÁNAMO]: Monteverde, Mar 1859, *C. Wright 1269* (**LECTOTYPE, here designated:** GOET [GOET010424]; ISOLECTOTYPES: BM [BM000839311], BR [000000531468], G [5 sheets, G00436458, G00436459, G00436460], GH [2 sheets, 00094966, 00094967], GOET [GOET010425], HAC, K [K000432640], PH [00029581], S [2 sheets, Nos. S07-14892, S07-14893], YU [2 sheets, YU.001779, YU.001780]).

Distribution.—Cuba (Pinar del Rio, Artemisa, Sancti Spiritus, Holguín, Guantánamo).

Notes.—Grisebach (1866:140), in the protologue of *Phialanthus resinifluus* Griseb., cited the material studied as "Cuba or., pr. Monteverde (Wr. [Wright] 1269); eundem fruticem e gemmis guttas resinosas stillantem in Jamaica leg. March. E.," without citing the herbarium of deposit. For information regarding Grisebach's original specimens, see notes under *P. myrtilloides*. Borhidi et al. (2017:259) cited the type of *P. resinifluus* as "Tipo: Cuba, Oriente, Monteverde, […], C. Wright 1269, Holotipo: GOET, isotipos: GH, S-HAC, US." According to the *Code*, starting from 1 January 2001, Borhidi et al.'s (2017) holotype citation cannot be treated as an inadvertent lectotypification because it is not accompanied by "here designated" or a similar expression.

In GOET there are two specimens of *Wright 1269* annotated with this name. The GOET specimen with barcode GOET010425 has a label with the heading "Plantae Cubenses Wrightianae," with the number "1269" handwritten by Wright, and "Phialanthus resinifluus m." handwritten by Grisebach. The specimen consists of a branch with numerous leaves and a few flowers in anthesis. In the envelope affixed on the sheet are included numerous leaves and a small branch with some flowers in anthesis.

The GOET specimen with barcode GOET010424 has a label with the heading "Plantae Cubenses Wrightianae," with the numbers "221 = 1269" handwritten by unknown authors, and "Phialanthus resinifluus m." handwritten by Grisebach. On the right side of that label are affixed two labels with a detail description of the specimen, handwritten by Grisebach. The specimen consists of a large, ramose branch with numerous leaves and numerous inflorescences with many flowers in anthesis. This specimen is here designated as the lectotype of *Phialanthus resinifluus*.

20. Phialanthus revolutus Urb., Repert. Spec. Nov. Veg. 17:407. 1921. TYPE: JAMAICA: Healthshire Hills, near Salt Island, 1 Sep 1908, *W. Harris & N.L. Britton 10525* (**NEOTYPE, here designated:** NY [02200764]; ISONEOTYPES: F [No. 243383], US [00879022]).

Distribution.—Jamaica.

Notes.—Urban (1921c:407), in the protologue of *Phialanthus revolutus* Urb., cited the material studied as "Hab. in Jamaica in Healthshire Hills prope Salt Island m. Sep. deflor.: Harris et Britton no. 10525," without citing the herbarium of deposit. The original material at B was destroyed during WWII. Three specimens of

Harris & Britton 10525 are in F, NY, and US. None of these specimens has proof that they were examined by Urban. The specimen in NY, with barcode 02200764, has a label with the heading "FLORA JAMAICENSIS" and the annotation "Phialanthus jamaicensis Urban" handwritten by an unknown author. The specimen consists of two branches. The branch on the right side of the sheet has larger leaves and no flowers. The branch on the left side of the sheet has numerous, smaller leaves and numerous flowers in anthesis. This specimen is here designated as the neotype of *P. revolutus*.

21. Phialanthus rigidus Griseb., Cat. Pl. Cub. 140. 1866. TYPE: CUBA. SANTIAGO DE CUBA: San Marcos, 1860–1864, *C. Wright 2725* (**LECTOTYPE, here designated:** GOET [GOET010426]; ISOLECTOTYPES: BM [BM000839310], G [G00436457], GH [00094968], HAC [2 sheets], K [K000174008], MPU [MPU021772], NY [02200765], S [S07-14890], US [00138509], YU [YU.001787]).

Distribution.—Cuba (Pinar del Rio, Artemisa, Villa Clara, Sancti Spiritus, Isla de Pinos).

Notes.—Grisebach (1866:140), in the protologue of *Phialanthus rigidus* Griseb., cited the material studied as "Cuba occ., pr. S. Marcos (Wr. [Wright] 2725). E.," without citing the herbarium of deposit. For information regarding Grisebach's original specimens, see notes under *P. myrtilloides*. Borhidi et al. (2017:259) cited the type of *P. rigidus* as "Tipo: Cuba; Prov. Pinar del Rio, San Marcos, […], C. Wright 2725, Holotipo: GOET, isotipos: GH, HAC, NY, S, US." According to the *Code*, starting from 1 January 2001, Borhidi et al.'s (2017) holotype citation cannot be corrected as an inadvertent lectotypification because it is not accompanied by "here designated" or a similar expression, and is here superseded.

In GOET there is a specimen, with barcode GOET010426, which has a label with the heading "Plantae Cubenses Wrightianae" and the annotation "Phialanthus rigidus m." followed by a detail description handwritten by Grisebach. The specimen consists of two branches with numerous leaves. The branch on the upper left side of the sheet does not have any visible flowers. The branch on the right side of the sheet has numerous inflorescences with flowers in anthesis. This specimen is here designated as the lectotype of *P. rigidus*.

22. Phialanthus stillans Griseb., Cat. Pl. Cub. 140. 1866. TYPE: CUBA. PINAR DEL RÍO: In vertice Guajarbon [Pan de Guajaibón], 16 Nov [1860–1864], *C. Wright 2726* (**LECTOTYPE, here designated:** GOET [GOET010427]; ISOLECTOTYPES: BM [BM000839309], G [G00436456], GH [00094969], HAC, K [K000432634], YU [YU.001782]).

Distribution.—Cuba (Pinar del Rio, Artemisa).

Notes.—Grisebach (1866:140), in the protologue of *Phialanthus stillans* Griseb., cited the material studied as "Cuba occ., in vertice m. Guajarbon (Wr. [Wright] 2726). E.," without citing the herbarium of deposit. For information regarding Grisebach's original specimens, see notes under *Phialanthus myrtilloides*. Borhidi et al. (2017:260) cited the type of *P. stillans* as "Tipo: Cuba; Prov. Pinar del Rio, Pan de Guajabón, […], C. Wright 2726, Holotipo: GOET, isotipos: GH, HAC, US." According to the *Code*, starting from 1 January 2001, Borhidi et al.'s (2017) holotype citation cannot be corrected as an inadvertent lectotypification because it is not accompanied by "here designated" or a similar expression.

The GOET specimen, with barcode GOET010427, has a label with the heading "Plantae Cubenses Wrightianae" and the annotation "Phialanthus stillans m." handwritten by Grisebach. On the verso of that label there is a detailed description of the species, handwritten by Grisebach. Above that label is affixed a small label with the annotation "Rubiac. Fruticose 10° f. Summit of Guajarbon. Nov. 16" handwritten in pencil by Charles Wright. This specimen consists of two small branches with a few flowers in anthesis, and is here designated as the lectotype of *P. stillans*.

PHIALANTHUS EXCLUDED TAXA

Phialanthus spicatus Wright, Anales Acad. Ci. Méd. Fís. Nat. Habana 6:149. 1869.
= *Ceratopyxis verbenacea* (Griseb.) Hook. f., in Hooker's Icon. Pl. 12:24, tat. 1125. 1876 (See above).

PORTLANDIA

Patrick Browne (1756:164–165) described the genus *Portlandia* P. Browne, without citing a Latin name for a species, and only published the English name "The large-leaf'd *Portlandia*." He dedicated the genus name to the Duchess of Portland, Margaret Cavendish Bentick (1715–1785). Linnaeus (1759:928) cited table 11 of

Browne's *History of Jamaica*, and published the name *P. grandiflora* L., which is the type species of the genus. *Portlandia* has a complex taxonomic history, because it was used by several authors to position numerous species with variable morphological characters, resulting in a genus of more than 20 species (e.g., Wernham, 1913; Britton, 1914; Urban, 1923a, 1923b). Aiello (1979) studied *Portlandia* and associated taxa, provided a taxonomic revision, with complete synonymy and typification, transferred numerous species to several new genera, mostly based on placentation and seed morphology, and restricted *Portlandia* to a genus of five species and one variety endemic to Jamaica. Delprete and Motley (2003), based on molecular and morphological data, elevated Aiello's variety to species level, adding to a total of six species endemic to Jamaica. In Paudyal et al.'s (2018) phylogenetic study, the six species of *Portlandia* formed a strongly supported monophyletic clade, sister to the *Isidorea* clade. A sister relationship of *Portlandia* and *Isidorea* was already found in previous studies (Delprete 1996; Rova et al. 2002; Delprete & Motley 2003; Motley et al. 2005; Robbrecht & Manen 2006; Manns & Bremer 2010). *Portlandia* is represented by shrubs or small trees growing in limestone areas, stipules broadly triangular, coriaceous, non-pungent, leaves coriaceous, non-pungent, inflorescences axillary, 1–6-flowered, corollas funnel-shaped, white, pink or red, stamens adnate to the base of corolla tube, ovary 2(3)-locular, placentation linear, adnate to the septum, stigmatic area as two lines along the style, capsules loculicidal, and seeds perpendicular, with tuberculate exotesta.

Portlandia P. Browne, Hist. Jamaic. 164, tab 11. 1756; Wernham, J. Bot. 51:320–324. 1913; Britton, Bull. Torrey Bot. Club 41 1–24. 1914; Standley, N. Amer. Fl. 32(1):8–13. 1918; Urban, Symb. Antill. 9:55–176. 1923; Urban, Symb. Rep. Sp. Regn. Veg. 19:1–9. 1923; Liogier, Fl. Cuba 5:27–28. 1962; Adams, Fl. Jamaica 704–705. 1972; Aiello, J. Arnold Arbor. 60 38–123. 1979; Delprete & Motley, Brittonia 55(3):233–239, f. 1–2. 2003; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018. TYPE: *Portlandia grandiflora* L.

1. Portlandia coccinea Sw., Prodr. 42. 1788. TYPE: JAMAICA: without locality, s.d., *Swartz s.n.* (FIRST-STEP LECTOTYPE (Aiello 1979:102), **SECOND-STEP LECTOTYPE, here designated:** S [No. S-R-5215]; ISOLECTOTYPES: BM n.v., F [No. 588420], M [M-0188947], S [No. S-R-5214], SBT [SBT13334]; POSSIBLE ISOLECTOTYPE: LINN-HS [321-3]).

Distribution.—Jamaica (Westmorland, Trelawny, St. Elizabeth, Manchester).

Notes.—Swartz (1788:42), in the protologue of *Portlandia coccinea* Sw., cited his own collection from Jamaica, without indicating any specimen or herbarium of deposit. Aiello (1979:102) cited the type of this name as "Type: Jamaica, without further locality, *Swartz s.n.* (lectotype, S!; probable isotype, BM!)." There are two specimens associated with this name in S, both collected by Swartz in Jamaica. Hence, Aiello's citation is a first-step lectotypification. The S specimen with accession number S-R-5215 is here designated as the second-step lectotype of *P. coccinea*.

Portlandia coriacea Spreng., Syst. Veg. 1:708. 1825, Sphalm. of *P. coccinea*.

2. Portlandia grandiflora L., Syst. Nat., ed. 10, 2:928. 1759. ["Habitat in Jamaica," Sp. Pl., ed. 2, 1:244. 1762]. TYPE [Icon.]: "Portlandia foliis majoribus nitidis ovatis oppositis, floribus amplissimis" in Browne, Civ. Nat. Hist. Jamaica: 164: tab. 11. 1756 (LECTOTYPE (Aiello 1979:100) [Tab. 11 is reproduced in Jarvis, p. 764. 2007].

Distribution.—Jamaica (the whole island).

Portlandia grandiflora var. parviflora S. Moore, J. Bot. 68:108. 1930. TYPE: JAMAICA: without locality, s.d., *Broughton s.n.* (HOLOTYPE: BRIST n.v.).

3. Portlandia harrisii Britton, Bull. Torrey Bot. Club 39:8. 1912. TYPE: JAMAICA. Peckham Woods, Upper Clarendon, 6 Jul 1911, *W. Harris 10975* (FIRST-STEP LECTOTYPE (Aiello 1979:104), **SECOND-STEP LECTOTYPE, here designated:** NY [00126749]; ISOLECTOTYPES: NY [00126748], UCWI n.v., US [00137329]).

Distribution.—Jamaica (Clarendon, St. Ann).

Notes.—Britton (1912:8), in the protologue of *Portlandia harrisii* Britton, stated "Type locality: Peckham Woods, Upper Clarendon, Jamaica," without citing any specimen or herbarium of deposit. Aiello (1979:104) cited the type of this name as "Type: Jamaica. Clarendon, Peckham Woods, *Harris 10975* (holotype, NY!; isotypes, NY!, UCWI!, US!)." Because she did not specify which of the two NY specimen is the "holotype," her citation is a first-step lectotypification. Both NY specimens have the annotation "Portlandia harrisii Britton"

handwritten by Britton. The NY specimen with barcode 00126748 consists of two branches with numerous leaves and some capsules.

The NY specimen with barcode 00126749 consists of two branches with numerous leaves, one of them with numerous capsules. At the base of the sheet is affixed an envelope including portions of dissected capsules and two corollas in anthesis. This specimen is here designated as the second-step lectotype of *P. harrisii*.

4. Portlandia microsepala Urb., Repert. Spec. Nov. Regni Veg. 13:478. 1915. TYPE: JAMAICA. ST. ANN: A bion, 1850, *R.C. Alexander s.n.* (NEOTYPE (Aiello 1979:106): K [K000173526]).

Distribution.—Jamaica (St. Ann).

Notes.—Urban (1915:478), in the protologue of *Portlandia microsepala* Urb., cited the material studied as "Hab. in Jamaica prope Moneague in Union Hill, m. Majo flor.: Alexander (typus), in collibus distr. St. Ann's fruct.: Alexander." Hence, Urban cited as type a flowering specimen collected by Alexander at Moneague on Union Hill. The original material in B studied by Urban was destroyed during WWII. Aiello (1979:106) cited the type of this name as "Type: Jamaica. St. Ann, Albion, *Alexander* in 1850 (holotype, K!)," with a locality corresponding to that of the paratype cited by Urban. She annotated the K specimen with barcode K000173526 as "Neotype of Portlandia microsepala Urb., Annette Aiello 1977." Among the specimens examined of this species, she cited duplicates of Alexander in NY and P, but I was unable to trace them. Her citation as "holotype" of the K specimen is an inadvertent neotype designation.

5. Portlandia platantha Hook. f., Bot. Mag. 76:tab. 4534. 1850. TYPE: cultivated at Kew, origin unknown [Jamaica], flowering in July 1850, *Collector Unknown s.n.* (HOLOTYPE: K [K000173522]).

Distribution.—Jamaica (St. Ann, St. Mary, St. Andrew, Portland, St. Thomas).

Portlandia grandiflora var. latifolia DC., Prodr. 4:405. 1830. TYPE: JAMAICA: without locality, s.d., *Collector Unknown s.n.* (HOLOTYPE: G-DC [3 sheets, G00666674, G00666685, G00666422]).

Notes.—In G-DC there are three sheets associated with this name, which are kept together in the same folder. Only one of these sheets, with barcode G00666674, has the annotation "Portlandia grandifolia β DC." handwritten by Candolle. Hence, according to Art. 8.3 of the *Code* (Turland et al. 2018), these three sheets are treated as a single specimen with multiple preparation, which is the holotype of *Portlandia grandiflora var. latifolia*.

Portlandia albiflora Britton & Harris ex Standl., N. Amer. Fl. 32:12. 1918. Type: JAMAICA: St. Andrew, Cane River Valley, 12 Jul 1907, *W. Harris 9637* (**LECTOTYPE, here designated:** NY [00126743]; isolectotypes: A [00058983], BM [000081655], CAS [0004142], K [K000173490], MO [No. 867111], NY [00126742], UCWI n.v, US [00137324]).

Notes.—Standley (1918:12), in the protologue of *Portlandia albiflora* Britton & Harris ex Standl., cited the type as "Type collected in Cane River Valley, Jul 12, 1907, *William Harris 9637* (herb. N. Y. Bot. Gard.)." Aiello (1979:103) cited the type of this name as "Type. Jamaica. […] *Harris 9637* (holotype, NY!; isotypes, A!, BM!, NY!, UCWI!, US!)." Hence, she did not specify which of the two specimens in NY is the "holotype." Both NY specimens have the annotation "Portlandia albiflora Britton & Harris" handwritten by Britton, and the stamp "Examined for NORTH AMERICAN FLORA." The NY specimen with barcode 00126743 consists of three branches with numerous leaves, with flowers and capsules, and is here designated as the lectotype of *P. albiflora*.

Portlandia latifolia Britton & Harris ex S. Moore, J. Bot. 68:108. 1930. TYPE: JAMAICA: St. Andrew, Hall's Delight, 3 Oct 1917, *W. Harris 12669* (HOLOTYPE: BM [2 sheets, 000081656 ("Sheet I"), 000081657 ("Sheet II")]; ISOTYPES: DS n.v., F [2 sheets, Nos. 492870, 492872], GH [00058979], K [3 sheets, K000173523, K000173524, K000173525], MO [No. 867111], NY [00126751], P [P02273497], UCWI, US [00137331]).

6. Portlandia proctorii (Aiello) Delprete, Brittonia 55(3):238, fig. 2. 2003. *Portlandia coccinea var. proctorii* Aiello, J. Arnorld Arbor. 60:102. 1979. TYPE: JAMAICA: St. Catherine, several mi N of Old Arbour, 12 Nov 1971, *G. Proctor 32708* (HOLOTYPE: IJ [No. 51993]; ISOTYPE: TEX n.v.).

Distribution.—Jamaica (St. Catherine).

PORTLANDIA EXCLUDED TAXA

Portlandia acuminata Willd. ex R. & S., Syst. 5:23. 1819.
= *Coutarea hexandra* (Jacq.) K. Schum. (See above).

Portlandia acunae Borhidi, Abstr. Bot. Univ. Budapest 5:35. 1977.
= *Isidorea acunae* (Borhidi) Borhidi (See above).

Portlandia brachycarpa Urb., Symb. Antill. 9:135. 1923.
= *Isidorea brachycarpa* (Urb.) Aiello (See above).

Portlandia corymbosa Ruiz & Pav., Fl. Peruv. 2:49. 1799.
= *Motleyothamnus corymbosum* (Ruiz & Pav.) Paudyal & Delprete (See above).

Portlandia daphnoides R. Graham, Edinburgh New Philos. J. 30:206. 1841.
= *Cubanola daphnoides* (R. Graham) Aiello (See above).

Portlandia domingensis Britton, Bull. Torrey Bot. Club 41:24. 1914.
= *Cubanola domingensis* (Britton) Aiello (See above).

Portlandia elliptica Britton, Bull. Torrey Bot. Club 41:22. 1914.
= *Schmidtottia elliptica* (Britton) Urb. (See below).

Portlandia ghiesbreghtiana Baill , Adansonia 12:300. 1879.
= *Coutaportla ghiesbreghtiana* (Baill.) Urb. (See above).

Portlandia guatemalensis Standl., J. Wash. Acad. Sci. 18:162. 1928.
= *Lorencea guatemalensis* (Standl.) Borhidi (See above).

Portlandia gypsophila Macfad. ex Griseb., Fl. Brit. W. Ind. 324. 1861.
= *Thogsennia lindeniana* (A. Rich.) Aiello (See below).

Portlandia hexandra Jacq., Sel. Stirp. Amer. Hist. 63. 1763.
= *Coutarea hexandra* (Jacq.) K. Schum. (See above).

Portlandia hexandra L., Mant. Pl., ed. 2, 45. 1767, *nom. superfl.*
= *Coutarea hexandra* (Jacq.) K. Schum. (See above).

Portlandia involucrata Wernham, J. Bot. 51:320. 1913. *Ceuthocarpus involucratus* (Wernham) Aiello, J. Arnold Arbor. 60:109. 1979.
= *Schmitottia involucrata* (Wernham) Alain (See below).

Portlandia lindeniana (A. Rich.) Britton, Bull. Torrey Bot. Club 41:23. 1914. *Gonianthes lindeniana* A. Rich., in R. de la Sagra, Hist. Fis. Cuba, Bot. 11:10. 1850.
= *Thogsennia lindeniana* (A. Rich.) Aiello (See below).

Portlandia longiflora Meisen ex Griseb., Cat. Pl. Cub. 126. 1866.
= *Cubanola daphnoides* (R. Graham) Aiello (See above).

Portlandia lumana (Baill.) Baill., Hist. Pl. 7:333. 1880. *Coutarea lumana* Baill., Adansonia 12:301. 1879.
= *Hintonia lumana* (Baill.) Bullock (See above).

Portlandia mexicana (Zucc. & Martius ex DC.) Hemsl., Diag. Pl. Nov. 31. 1879. *Coutarea mexicana* Zucc. & Martius ex DC., Prodr. 4:350. 1830. *Cigarilla mexicana* (Zucc. & Martius ex DC.) Aiello, J. Arnold Arbor. 60:117. 1979, *nom. superfl.*
= *Nernstia mexicana* (Zucc. & Martius ex DC.) Urb. (See above).

Portlandia nitens Britton, Bull. Torrey Bot. Club 39:10. 1912.
= *Schmidtottia nitens* (Britton) Urb. (See below).

Portlandia oblanceolata Urb , Symb. Antill. 9:136. 1923.
= *Isidorea oblanceolata* (Urb.) Aiello (See above).

Portlandia ophiticola Borhidi, Növenyrendsz. Novényföldr. Tansz., Eötvös Loránd Tudományegyet. Budapest 5:34. 1977.
= *Isidorea ophiticola* (Borhidi) Borhidi (See above).

Portlandia pendula C. Wright ex Griseb., Cat. Pl. Cub 126. 1866.
= *Siemensia pendula* (C. Wright ex Griseb.) Urb. (See below).

Portlandia polyneura Urb , Symb. Antill. 9:135. 1923.
= *Isidorea polyneura* (Urb.) Aiello (See above).

Portlandia pterosperma S. Watson, Proc. Amer. Acad. Arts 24:52. 1889.
= *Hintonia latiflora* (Sessé & Moçiño ex DC.) Bullock (See above).

Portlandia sessilifolia Britton, Bull. Torrey Bot. Club 41:21. 1914.
= *Schmidtottia sessilifolia* (Britton) Urb. (See below).

Portlandia shaferi Standl., N. Amer. Fl. 32:9. 1918.
= *Schmidtottia shaferi* (Standl.) Urb. (See below).

Portlandia speciosa Baill., Hist. Pl. 7:381. 1880.
= *Coutarea hexandra* (Jacq.) K. Schum. (See above).

Portlandia uliginosa Wernham, J. Bot. 51. 320. 1913.
= *Schmidtottia uliginosa* (Wernham) Urb. (See below).

RAMONADOXA

Urban (1921a:163) described *Chiococca cubensis* Urb., a species endemic to Sierra de Nipe, eastern Cuba. In Paudyal et al.'s (2018) phylogenetic analyses, *Chiococca cubensis* was represented by two different collections. It was retrieved as a sister taxon to *Scolosanthus* in the combined and nuclear phylogenies, or nested within the *Scolosanthus* clade in the analysis using only the plastid dataset. In their analyses, the *Scolosanthus-Chiococca cubensis* clade is sister to the *Salzmannia* clade. *Chiococca cubensis* is similar to *Salzmannia*, as delimited by Paudyal et al. (2018), by the tubular-subcylindrical corollas, from which it can be distinguished by the branches without resinous exudate (vs. with resinous exudate), cymose inflorescence (vs. subcapitate or small racemes), corollas deep purple-brown outside and yellow inside (vs. white, pale yellow, yellow orangish-yellow to greenish) and by being endemic to Cuba (vs. occurring in coastal cordillera of Venezuela and coastal Brazil). *Chiococca cubensis* is similar to *Scolosanthus* in having narrowly imbricate corollas, from which it can be distinguished by being a scandent or climbing shrub lacking thorns (vs. erect shrubs with bifurcate or trifurcate thorns in *Scolosanthus*). It can be distinguished from all the other *Chiococca* species by having corollas tubular-subcylindrical, purple-brown outside and yellow inside, while in the other *Chiococca* species the corollas are campanulate to funnelform, white, cream-white to pale yellow throughout, or exceptionally reddish outside. According to the molecular phylogenies and morphological differences mentioned above, Paudyal et al. (2018) transferred *C. cubensis* to *Ramonadoxa* Paudyal & Delprete, dedicating the generic name to Ramona Oviedo-Prieto (Instituto de Ecología y Sistemática, Ministerio de Ciencia, Tecnología y Medio Ambiente, La Havana, Cuba), an extremely knowledgeable botanist specialized on the Cuban flora. *Ramonadoxa* is a monotypic genus known from thickets, charrascal vegetation and pinelands of eastern Cuba (Oriente).

Ramonadoxa Paudyal & Delprete, Bot. J. Linn. Soc. 187:389. 2018; Urban, Symb. Antill. 9:163. 1921; Standley, N. Amer. Fl. 32(4):287. 1934; Liogier, Fl. Cuba 5:94. 1962; Borhidi et al., Rubiáceas Cuba 70. 2017; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018; Borhidi et al., Acta Bot. Hung. 60(3–4):300–302. 2018. Type: *Ramonadoxa cubensis* (Urb.) Paudyal & Delprete

1. Ramonadoxa cubensis (Urb.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:389. 2018. *Chiococca cubensis* Urb., Symb. Antill. 9:163. 1921. Type: CUBA. Holguín: Sierra de Nipe, Río Piedra, in charrascales, 200 m, 21 Oct 1919, *E.L. Ekman 9996* (lectotype (Paudyal et al. 2018:390): S [No. S-10-24102]).

Distribution.—Cuba (Holguín: Sierra de Nipe, Mayarí, Sierra de Moa; Guantánamo: Baracoa).

Notes.—Urban (1923:163), in the protologue of *Chiococca cubensis* Urb., cited the gathering *Ekman 9996* as the type, without indicating the herbarium of deposit. The original material at B studied by Urban was destroyed during WWII. Borhidi et al. (2017:70; 2018:301) cited the type of *C. cubensis* as "[…] Sierra de Nipe ad Río Piedra in charrascales 200 m alt., Ekman 9996; holotipo B†, lectotipo: S!). According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017, 2018) lectotype designations are not valid. In S there is a specimen of *Ekman 9996*, with accession number S-10-24102, which was designated as the lectotype by Paudyal et al. (2018:390).

SALZMANNIA

Candolle (1830:617) described the genus *Salzmannia* DC., dedicating the generic name to Philipp Salzmann (1781–1851), a German doctor, who made several expeditions in the tropics, and valuable botanical collections in northeastern Brazil in 1827–1830. In the genus, Candolle (1830:617) included the sole species *S. nitida* DC., citing material collected by Salzmann in the Brazilian state of Bahia. Jardim et al. (2015) distinguished *Chiococca* from *Salzmannia* from northeastern Brazil, by being plants without resinous exudates or with only very small quantities of these (vs. with copious resinous exudate in *Salzmannia*), inflorescences lax, cymose or racemiform (vs. subcapitate), corollas campanulate, funnelform, or tubular, white to yellow with 5 lobes, valvate or narrowly imbricate in bud (vs. corollas tubular, yellow to orange, commonly with 4 lobes, rarely varying and up to 6 within certain populations, narrowly imbricate in bud), style subcapitate to fusiform or bifid with linear lobes (vs. style bifid with linear lobes), mature fruits white or yellowish white (vs. pink to purple). In addition, Jardim (in Jardim et al. 2015) described an arboreal species of *Salzmannia*, *S. arborea* Jardim. Paudyal et al. (2018), in their molecular phylogenetic trees, found two species of *Chiococca*, *C. plowmanii* (from coastal dunes of Brazil; Delprete 2005) and *C. naiguatensis* (from coastal cordillera of Venezuela; Steyermark, 1972a) on a strongly supported clade, with two species of *Salzmannia* (from coastal dunes of Brazil; Jardim et al. 2015). Hence, they transferred the two *Chiococca* species to *Salzmannia*, providing the necessary new combinations.

Salzmannia sensu Paudyal et al. (2018) is a genus of four species, with one growing on the costal cordillera of Venezuela, and other three growing on the coastal dunes, restinga, and forested vegetation of northeastern Brazil (Delprete 2005 ["2004"]; Jardim et al. 2015; Paudyal et al. 2018).

Salzmannia DC., Prodr. 4:617. 1830; Steyermark, Acta Bot. Venez. 6:135, fig. 5. 1972 ["1971"]; Delprete, Rev. Biol. Neotrop. 1(1–2):4–10, f. 1. 2005 ["2004"]; Jardim et al., Phytotaxa 202(10):15–25. 2015; emend. Paudyal et al., Bot. J. Linn. Soc. 187:390–391. 2018. TYPE: *Salzmannia nitida* DC.

1. Salzmannia arborea J.G. Jardim, Phytotaxa 202(1):20, fig. 1. 2015. TYPE: BRAZIL. BAHIA: Mun. Una, Reserva Biológica do Mico-Leão (IBAMA), entrada no km 46 da Rod. Ilhéus–Una, 15°9′S, 39°5′W, 21 Oct 1992, *A.M. de Carvalho, A.M. Amorim, S.C. de Sant'Ana & J.G. Jardim 4085* (HOLOTYPE: CEPEC [CEPEC56640]; ISOTYPES: ALCB n.v., JPB [No. 62039], MO [MO-102917752], NY [00503586]).

***Distribution.*—**Brazil (Bahia).

2. Salzmannia naiguatensis (Steyerm.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:391. 2018. *Chiococca naiguatensis* Steyerm., Acta Bot. Venez. 6:135, fig. 5. 1972 ["1971"]. TYPE: VENEZUELA. DISTRITO FEDERAL: Cerro Naiguatá, cloud forest, N facing slopes, Loma de las Delicias, towards Quebrada Caja de Agua, W of Hacienda Coquizal, 1400 m, 8 Oct 1966, *J.A. Steyermark 97475* (HOLOTYPE: VEN [No. 71606]; ISOTYPES: MO [No. 2270191, NY [00099437], U [U0005960]).

***Distribution.*—**Venezuela (Distrito Federal).

3. Salzmannia nitida DC., Prodr. 4:617. 1830. TYPE: BRAZIL. BAHIA: "ad bahiam in collibus aridis," s.d. [1827–1830], *P. Salzmann s.n.* (HOLOTYPE: G-DC [G00667887]; POSSIBLE ISOTYPES: BM [0005516631], F [No. 617617], HAL [2 sheets, HAL0113337, HAL113876], HBG [HBG-521019], K [K000015313], MO [No. 1797023], MPU [5 sheets, MPU021514, MPU021515, MPU021516, MPU021517, MPU021518]).

***Distribution.*—**Brazil (Bahia).

4. Salzmannia plowmanii (Delprete) Paudyal & Delprete, Bot. J. Linn. Soc. 187:391. 2018. *Chiococca plowmanii* Delprete, Rev. Biol. Neotrop. 1:5, fig. 1, 2005 ["2004"]. TYPE: BRAZIL. BAHIA: Mun. Salvador, along rd (Av. Otávio Mangabeira = BA-033) from Itapuã to Aeroporto Dois de Julho, at traffic circle (intersection with Av. Luis Viana Filho), near sea level, relict area with high dunes, 24 Feb 1985, *T. Plowman & I.C. Britto 13948* (HOLOTYPE: CEPEC [No. CEPEC00036435]; ISOTYPES: F [2 sheets, Nos. 1993896, 1944115], G [G00389940], MO [No. 3509664], NY [01365079], SP [SP001597], U [U0119465]).

***Distribution.*—**Brazil (Bahia).

SCHMIDTOTTIA

Urban (1923a) segregated *Schmidtottia* from *Portlandia* because of its terminal inflorescence (vs. lateral in *Portlandia*), sheathing, truncate stipules (vs. interpetiolar, triangular), septicidal capsules (vs. loculicidal), and ovate to obovate placenta (vs. linear). He dedicated the generic name to Otto Schmidt (1891–1956), a Russian scientist.

Wernham (1913:320), published *Portlandia involucrata* Wernham, and Alain Liogier (1959:1959), transferred it to *Schmidtottia involucrata* (Wernham) Alain. Aiello (1979) transferred *S. involucrata* to the monotypic genus *Ceuthocarpus* Aiello, because of its acropetally imbricated seeds and solitary flowers surrounded by an involucre of leafy bracts.

Paudyal et al. (2018), in their molecular phylogenetic analyses, found the seven species of *Schmidtottia* included in the study on a strongly supported clade along with *Ceuthocarpus involucratus*, hence they returned to *Ceuthocarpus* to *Schmidtottia*, in agreement with Alain (1959). Several new species and subspecies were published by Borhidi and Acuña (1971), Borhidi and Muñiz (1975), and Borhidi (1977, 1980, 2002). Liogier (1962) produced a key to the nine Cuban species of *Schmidtottia* known to him. Borhidi et al. (2018) published a synopsis of *Schmidtottia*, where they recognized 17 species. In the present treatment, *Schmidtottia* is treated as a genus of 11 species endemic to Cuba.

Schmidtottia Urb., Symb. Antill. 9:137. 1923; Liogier, Fl. Cuba 5:29–32. 1962; Aiello, J. Arnold Arbor. 60:108–109. 1979; Borhidi, Acta Bot. Hung. 29:181–216. 1981 ["1980"]; Borhidi, Acta Bot. Hung. 44(1–2):49–65. 2002; Borhidi et al., Rubiáceas Cuba 371–386, f. 111-16. 2017; Paudyal et al , Bot. J. Linn. Soc. 187(3):365–396. 2018; Borhidi et al , Acta Bot. Hung. 60(3–4):295–299. 2018. TYPE: *Schmidtottia monantha* Urb.

Ceuthocarpus Aiello, J. Arnold Arbor. 60:108. 1979. TYPE: *Ceuthocarpus involucratus* Aiello [= *Schmidtottia involucrata* (Wernham) Alain]

1. Schmidtottia cubensis (Standl.) Urb., Symb. Antill. 9:139. 1923.

1a. Schmidtottia cubensis ssp. **cubensis**, Symb. Antill. 9:139. 1923. *Isidorea cubensis* Standl., N. Amer. Fl. 32:15. 1918. TYPE: CUBA. HOLGUÍN: Sierra de Nipe, Arroyo del Medio, above the falls, 450–550 m, 20 Jan 1910, *A. Shafer 3230* (**LECTOTYPE, here designated:** NY [00115156]; ISOLECTOTYPES: HAC, NY [2 sheets, 00115154, 00115155], US [00026700 (frag. ex NY)]).

Distribution.—Cuba (Holguín: Sierra de Nipe, Sierra del Cristal).

Notes.—Standley (1918:15), in the protologue of *Isidorea cubensis* Standl., cited the material studied as "Type collected among rocks, near water, Arroyo del Medio, […], *J.A. Shafer 3230* (herb. N. Y. Bot. Gard.)." In NY there are three specimens of *Shafer 3230*.

Borhidi (2002:55) cited the type of *I. cubensis* as "*Holotipo*: Cuba, Sierra de Nipe, […] leg.: A. Shafer, 3230, 20.01.1910, NY!; *isotypo*: HAC." Borhidi et al. (2017:373; 2018:298) cited the type of *I. cubensis* as "Tipo: Cuba, Sierra de Nipe, Arroyo del Medio […], A. Shafer 3230 Holotipo: NY!, isotipo HAC!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi's (2002) and Borhidi et al.'s (2017, 2018) "holotype" citations cannot be corrected as inadvertent lectotype designations.

Each NY specimen, with barcodes 00115154, 00115155, and 00115156, has a label with the annotation "Isidorea?' handwritten by an unknown author, and "cubensis Standley" handwritten by Standley. The specimen with barcode 00115156, consists of two branches, one with numerous leaves and a few capsules, and the other leafless, with a dehisced capsule. This specimen is here designated as the lectotype of *Isidorea cubensis*.

1b. Schmidtottia cubensis ssp. **cristalensis** (Borhidi & Muñiz) Borhidi, Acta Bot. Hung. 44(1–2):56. 2002. *Schmidtottia cubensis* var. *cristalensis* Borhidi & Muñiz, Acta Bot. Acad. Sci. Hung. 21:230. 1975. TYPE: CUBA. HOLGUÍN: Sierra del Cristal, Loma El Serrucho, 2–7 Apr 1956, *Hno. Alain [A.H. Liogier], J.B. Acuña, & M. López Figueiras 5402* (**LECTOTYPE, here designated:** HAC [annotated as "holotypus" by Borhidi]; ISOLECTOTYPES: HAC, NY [00126819]).

Distribution.—Cuba (Sierra del Cristal).

Notes.—Borhidi & Muñiz (1975:230), in the protologue of *Schmidtottia cubensis* var. *cristalensis* Borhidi & Muñiz, did not specify which of the HAC specimens is the holotype. The HAC specimen with the

annotation "var. *cristalensis* Borhidi HOLOTYPUS!" handwritten by Borhidi, is here designated as the lectotype of this varietal name.

2. Schmidtottia cucullata Borhidi & Bisse, in Borhidi, Acta Bot. Acad. Sci. Hung. 26:271, fig. 8. 1980. TYPE: CUBA. HOLGUÍN: Sierra de Moa, Cayo Coco, charrascales, 200–300 m, 13 Aug 1970 (fl), *J. Bisse & H. Lippold HFC No. 17618* (HOLOTYPE: HAJB [HAJB G 000839]; ISOTYPES: HAJB [HAJB G 000840], JE [JE00004996]).

Distribution.—Cuba (Holguín: Sierra de Moa).

3. Schmidtottia elliptica (Britton) Urb , Symb. Antill. 9:139. 1923. *Portlandia elliptica* Britton, Bull. Torrey Bot. Club 41:22. 1914. TYPE: CUBA. GUANTÁNAMO: Between Baracoa and Florida, on serpentine rocks, 15 Mar 1910, *J.A. Shafer 4332* (**LECTOTYPE, here designated:** NY [00126746]; ISOLECTOTYPES: A [2 sheets, 00058981, 00105431], HAC, NY [00126747], US [00137326]).

Distribution.—Cuba (Guantánamo; Holguín: Sierra de Moa).

Notes.—Britton (1914:22), in the protologue of *Portlandia elliptica* Britton, cited the material examined as "Thickets on serpentine rocks, between Baracoa and Florida, Oriente, Cuba, March 15, 1910 (*Shafer 4332*)," without citing the herbarium of deposit. Borhidi (2002:57) and Borhidi et al. (2017:376; 2018:298) cited as the holotype of *Portlandia elliptica* a specimen in NY. According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi's (2002) and Borhidi et al.'s (2017, 2018) "holotype" citations cannot be treated as inadvertent lectotypifications.

There are two specimens of *Shafer 4332* in NY, and one in US. The NY specimen with barcode 00126746 has a label with "Portlandia" handwritten by an unknown author, and "elliptica Britton, Type" handwritten by Britton. This specimen consists two branches with several leaves, numerous flower buds, and two flowers in anthesis, and is here designated as the lectotype of *P. elliptica*.

The NY specimen with barcode 00126747 has a label with "Portlandia" handwritten by unknown author, and "elliptica Britton" handwritten by Britton. This specimen consists two branches with several leaves and numerous dehisced capsules, and is an isolectotype.

Schmidtottia elliptica ssp. *oblongata* Borhidi, Acta Bot. Acad. Sci. Hung. 26:273. 1980, **syn. nov.** TYPE: CUBA. HOLGUÍN: Moa, Cayoguán, camino hacia la Mina Delta, 15–16 Jul 1949, *Bro. Clemente, Bro. Alain & Bro. Chysogone 6829* (HOLOTYPE: HAC [*Bro. Clemente et al. 6829*]; ISOTYPES: HAC [*Bro. Alain 929*], NY [00126820 (*Bro. Alain & Bro. Clemente 929*)]).

4. Schmidtottia involucrata (Wernham) Alain, Contr. Ocas. Mus. Hist. Nat. Colegio De la Salle 17:10. 1959. *Portlandia involucrata* Wernham, J. Bot. 51:320. 1913. *Ceuthocarpus involucratus* (Wernham) Aiello, J. Arnold Arbor. 60:109. 1979. TYPE: CUBA. HOLGUÍN: Camp La Gloria to Moa Bay, 31 Dec 1910–1 Jan 1911, *J.A. Shafer 8282* (HOLOTYPE: NY [00126750]; ISOTYPES: A [00219729], F [No. 450905], GH [00058980], MO [No. 805437], US [00137330]).

Distribution.—Cuba (Holguín: Moa).

Ceuthocarpus involucratus var. *moaensis* Borhidi, Acta Bot. Hung. 44(1–2):51. 2002. *Schmidtottia involucrata* var. *moaensis* (Borhidi) Borhidi, Acta Bot. Hung. 60:298. 2018, **syn. nov.** TYPE: CUBA. HOLGUÍN: Moa, orillas del Río Cayoguán, cerca de la mina, 2 Jul 1945, *Bro. Clemente, Bro. Alain & Bro. Chysogone 4485* (HOLOTYPE: HAC n.v.; ISOTYPE: NY n.v.).

Ceuthocarpus involucratus var. *elatior* Borhidi, Acta Bot. Hung. 44(1–2):51. 2002. *Schmidtottia involucrata* var. *elatior* (Borhidi) Borhidi, Acta Bot. Hung. 60:298. 2018, **syn. nov.** TYPE: CUBA. HOLGUÍN: Baracoa, charrascos en el valle del Río Maraví, *J. Bisse HFC No. 18240* (HOLOTYPE: HAJB n.v.).

Notes.—As a result of a detailed search in HAJB, no original material *Ceuthocarpus involucratus* var. *elatior* Borhidi was found. The HAJB curator, Eldis R. Bécquer (pers. comm.), is not aware of the possible location of the type specimens of this name. According to him, all the Rubiaceae specimens that were on loan to JPU, for study by Attila Borhidi, were returned to HAJB.

5. Schmidtottia marmorata Urb., Symb. Antill. 9:140. 1923. TYPE: CUBA. GUANTÁNAMO: Prope Baracoa, ad Rio Yoa, in charrascales, 28 Nov 1914, *E.L. Ekman 3675* (**LECTOTYPE, here designated:** S [No. S-R-7819]; ISOLECTOTYPES: HAC [ex LS], NY [00126821 (frag.)]).

Distribution.—Cuba (Guantánamo: Toa, Baracoa).

Notes.—Urban (1923a:140–141), in the protologue of *Schmidtottia marmorata* Urb., cited the gathering "Prov. Oriente prope Baracoa ad Rio Yoa in charrascales, m. Nov. fruct.: [Ekman] n. 3675," without indicating the herbarium of deposit. The original material studied by Urban in B was destroyed during WWII. Borhidi (2002:58) cited the type of this name as "*Holotipo*: Cuba, Prov. Oriente, […] leg.: E L. Ekman, 3675, 28.11. 1914, S; *isotypo*: HAC." Borhidi et al. (2017:378; 2018:298) cited the type of this name as "Tipo: Cuba, Prov.

Oriente, […] 28.11.1914, E.L. Ekman 3675; Holotipo: B†. Lectotipo: S!, isolectotipo: HAC!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi (2002) "holotype" citation, and Borhidi et al. (2017, 2018) "lectotype" citations are not valid lectotypifications. In S there is a specimen of *Ekman 3675*, with accession number S-R-7819, which has a label with the annotation "Schmidtottia marmorata Urb. (typus)" handwritten by Urban. The specimen consists of a branch with numerous leaves, several infructescences with dehisced capsules, and is here designated as the lectotype of *S. marmorata*.

5. Schmidtottia monantha Urb , Symb. Antill. 9:138. 1923. TYPE: CUBA. GUANTÁNAMO: near Maraví, in a pine grove, 25 Dec 1914, *E.L. Ekman 4028* (**LECTOTYPE, here designated:** S [No. S-R-7818]; ISOLECTOTYPES: HAC [ex LS], NY [00126823 (frag.)]).

Distribution.—Cuba (Holguín: Peña Prieta, Toa; Guantánamo: Maraví).

Notes.—Urban (1923a:138–139), in the protologue of *Schmidtottia monantha* Urb., cited the material studied as "Prov. Oriente prope Maraví in pinetis, m. Dec. fl. et fr.: [Ekman] n. 4028 (typus), inter Tabo et Nibujón in charrascales-pinales locis humilibus, m. Dec. fl. et fr.: [Ekman] n. 3741," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. Borhidi (2002:58) cited the type of this name as "*Holotipo*: Cuba, Prov. Oriente, pinares del Rio Mayarí, leg.: E L. Ekman, 4028, 25.12.1914, S; *isotypo*: HAC." Borhidi et al. (2017:378; 2018:298) cited the type of this name as "[…] Pinares del Rio Maraví, 25.12.1914, leg. *E.L. Ekman 4028*, Holotipo: B†; lectotipo: S!, isolectotipo: HAC!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi's (2002) "holotype" citation cannot be treated as an inadvertent lectotype citation, and Borhidi et al. (2017, 2018) "lectotype" designations are not valid.

In S there is a specimen of *Ekman 4028*, with accession number S-R-7818, which has a label with the annotation "Schmidtottia monantha Urb. (typus)" handwritten by Urban. The specimen consists of three branches, two of them with numerous leaves and without flowers, and a small branch with a flower in anthesis. Specimen with accession number S-R-7818 is here designated as the lectotype of *S. monantha*.

Schmidtottia parvifolia Alain, Contr. Ocas. Mus. Hist. Nat. La Salle 17:10. 1959, **syn. nov.** TYPE: CUBA. HOLGUÍN: Toa, Peña Prieta, 600 m, 30 Dec 1953 (fl-fr), *Bro. Alain [A. Liogier] LS No. 3592* (HOLOTYPE: HAC [ex LS]; ISOTYPE: NY [00126825]).

Notes.—Alain (1959: 10) in the protologue of *Schmidtottia parvifolia* Alain, cited his own gathering *Alain 3592* in LS, which was later integrated in HAC. That specimen is the holotype of this name.

6. Schmidtottia multiflora Urb., Symb. Antill. 9:141. 1923. TYPE: CUBA. ORIENTE: Sierra Azul, in charrascales, 500–700 m, 23 Jan 1915, *E.L. Ekman 4422* (**LECTOTYPE, here designated:** S [No. S-R-7816]).

Distribution.—Cuba (Holguín, Guantánamo).

Notes.—Urban (1923a:141–142), in the protologue of *Schmidtottia multiflora* Urb., cited the material studied as "Prov. Oriente in Sierra Azul in charrascales, 500–700 m. alt., m. Jan. flor.: [Ekman] n. 4422," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. Borhidi (2002:59) cited the type of this name as "*Holotipo*: Cuba, Prov. Oriente, […], leg.: E L. Ekman, 4422, S!" Borhidi et al. (2017:379; 2018:298) cited the type of this name as "Cuba, Prov. Oriente, […] leg.: *E.L. Ekman 4422*. Holotipo: B†; lectotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi's (2002) "holotype" citation cannot be treated as an inadvertent lectotype citation, and Borhidi et al.'s (2017, 2018) "lectotype" designations are not valid.

In S there is a specimen of *Ekman 4422*, accession number S-R-7816, which has a label with the annotation "Schmidtottia multiflora Urb. (typus)" handwritten by Urban. It consists of a branch with a terminal inflorescence and numerous flower buds. This specimen is here designated as the lectotype of *S. multiflora*.

7. Schmidtottia nitens (Britton) Urb., Symb. Antill. 9:141. 1923. *Portlandia nitens* Britton, Bull. Torrey Bot. Club 39:10. 1912. TYPE: CUBA. GUANTÁNAMO: Baracoa, Upper Valley of Río Navas, 22 Mar 1910, *J.A. Shafer 4450* (**LECTOTYPE, here designated:** NY [00126756]; ISOLECTOTYPES: HAC, NY [00126757], US [00137332 (one corolla and a leaf fragment (ex NY)]).

Distribution.—Cuba (Guantánamo: Baracoa).

Notes.—Britton (1912:10), in the protologue of *Portlandia nitens* Britton, cited the material studied as

"Dry thicket, upper valley of the Rio Navas, Oriente, March 22, 1910, *Shafer 4450*," without citing the herbarium of deposit. Borhidi (2002:61) cited the type of this name as "*Holotipo*: Cuba, […] leg.: A. Shafer, 4450, 23.03.1910, NY!; *isotypo*: HAC." Borhidi et al. (2017:380; 2018:298) cited the type of *P. nitens* as "[…] 23.03.1910, *A. Shafer 4450*, Holotipo: NY!; isotipo: HAC!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi's (2002) and Borhidi et al.'s (2017, 2018) "holotype" citations cannot be treated as inadvertent lectotypifications.

In NY, there are two specimens of *Shafer 4450.* The specimen with barcode 00126756 has a label with the annotation "Type. Portlandia elliptica Britton," handwritten by Britton. It consists of two branches with several leaves, both of them with terminal inflorescences and numerous flowers in anthesis. This specimen is here designated as the lectotype of *P. nitens*.

The NY specimen with barcode 00126757 has a label with "Portlandia elliptica Britton" handwritten by Britton. This specimen consists of three branches. One branch has several leaves and an infructescence with several dehisced capsuled. The second branch is sterile, with three leaf pairs. The third branch is leafless, and with a terminal depauperate infructescence. This specimen is an isolectotype.

8. Schmidtottia sabra Borhidi & Acuña, Acta Bot. Acad. Sci. Hung. 17:30. 1971. TYPE: CUBA. HOLGUÍN: Region de Moa, Mina Potosí, supra Yamanigüey, in fruticetis serpentinosis, May 1968, *V. Samek SV No. 26828* (HOLOTYPE: HAC [ex SV No. 26828]).

Distribution.—Cuba (Holguín: Moa).

9. Schmidtottia sessilifolia (Britton) Urb., Symb. Antill. 9:142. 1923. *Portlandia sessilifolia* Britton, Bull. Torrey Bot. Club 41:21. 1914. TYPE: CUBA. HOLGUÍN: South of Sierra de Moa, Camp La Gloria, 24–30 Dec 1910, *J.A. Shafer 8190* (HOLOTYPE: NY [00126760]; ISOTYPES: A [00058976], HAC).

Distribution.—Cuba (Holguín: Sierra de Moa; Guantánamo).

Notes.—Britton (1914:21), in the protologue of *Portlandia sessilifolia* Britton, cited the material studied as "Type from Camp La Gloria, south of Sierra Moa, Cuba, December, 1910 (Shafer 8190)," without citing the herbarium of deposit. In NY, where Britton worked, there is a single specimen of *Shafer 8190*, which has a label with the annotation "Type. Portlandia sessilifolia Britton" handwritten by Britton. This specimen is the holotype of this name.

Schmidtottia monticola Borhidi, Acta Bot. Acad. Sci. Hung. 26:269. 1981 ["1980"], **syn. nov.** TYPE: CUBA. ORIENTE: Sierra de Moa, charrascos [pine barrens], 800–900 m, 26 Jul 1953, *Bro. Alain [A.H. Liogier] 3447* (HOLOTYPE: HAC [ex LS]; ISOTYPE: NY [00126824]). ***Notes.—***Borhidi (1981 ["1980"]:269–271) distinguished *Schmidtottia sessilifolia* (Britton) Urb. from *S. monticola* Borhidi by the leaves scabrous above, calyx 5-lobed, lobes hirsute, corollas to 1.5 cm long, and capsules 5–6 mm long. Borhidi et al. (2017:372), in the key to the Cuban species of *Schmidtottia*, differentiated *S. sessilifolia* from *S. monticola* by the leaves scabrous above (vs. glabrous above in *S. monticola*), calyx 5-lobed, hirsute (vs. calyx 4-lobed, glabrous), and corollas 1.5 cm long (vs. 2–2.5 cm long). The study of additional specimens confirmed that the characters used by Borhidi to separate the two taxa are intergrading, and the two names are here treated as synonymous.

10. Schmidtottia shaferi (Standl.) Urb., Symb. Antill. 9:142. 1923. *Portlandia shaferi* Standl., N. Amer. Fl. 32:9. 1918. *Schmidtottia sessilifolia* ssp. *shaferi* (Standl.) Borhidi, Bot. Közelm. 58:176. 1971. TYPE: CUBA. HOLGUÍN: Río Yamaniguey to Camp Toa, 400 m, 22–26 Feb 1910, *J.A. Shafer 4180* (HOLOTYPE: US [No. 793795, barcode 00137336]; ISOTYPES: A [2 sheets, 0058975, 00105430], F [No. 460039], NY [00126761]).

Distribution.—Cuba (Holguín, Guantánamo, Santa Clara).

Notes.—Standley (1918:9–10), in the protologue of *Portlandia shaferi* Standl., cited the material studied as "Type collected on compact red soil, Río Yamaniguey to Camp Toa, […] *J.A. Shafer 4180* (U.S. Nat. Herb. *no. 793795*)." Therefore, the holotype of this name is the US specimen with accesion number 793795. Borhidi et al. (2017:383; 2018:299) cited the type of *P. shaferi* as "Tipo: Cuba, Prov. Oriente, […],22–26 Jul 1910, Shafer 4180. Holotipo: NY!; isotipo: HAC!" Hence, Borhidi et al.'s (2017:383; 2018:299) holotype citation for this name is erroneous.

Borhidi (1981 ["1980"], 2002) described three subspecies in this species, using calyx lobe shape and capsule shape to differentiate them. A comparison of specimens from throughout the geographical range of

this species demonstrated that that these characters are variable and overlapping and without any geographical correlation. Hence, no infraspecific taxa are recognized in this species.

Schmidtottia shaferi var. *micarensis* Alain, Contr. Ocas. Mus. Hist. Nat. Colegio De La Salle 17:10. 1959. *Schmidtottia shaferi* ssp. *micarensis* (Alain) Borhidi, Acta Bot. Hung. 44:63. 2002, **syn. nov.** Type: CUBA. Holguín: Mayarí, Sierra de Mícara, Río Lebisa, 30 Dec 1955, *Bro. Alain [A.H. Liogier] & M. López Figueiras 4833* (holotype: HAC [ex LS]; isotypes: HAJB [HAJB G 000841], NY [00126826]).

***Notes.*—**Brother Alain [Alain H. Liogier] (1959:10) cited the type of *Schmidtottia shaferi* var. *micarensis* Alain as "Sierra de Mícara, Río Lebisa, Mayarí, 30 Dec. 1955, Hno. Alain & M. López Figueiras 4833," without citing the herbarium of deposit. The specimen that was in LS, where Alain Liogier worked, is annotated as "micarensis Alain" by Alain, and is the holotype of this name. The LS specimens are now integrated in HAC.

Schmidtottia shaferi ssp. *neglecta* Borhidi, Acta Bot. Acad. Sci. Hung. 26:272. 1981 ["1980"]. *Schmidtottia neglecta* (Borhidi) Borhidi, Acta Bot. Hung. 44:59. 2002, **syn. nov.** Type: CUBA. Holguín: Moa, Mina Franklin, in pinetis, 400 m, 20 Jul 1947, *Bro. León & Bro. Clemente FHC No. 23227* (holotype: HAC [ex LS]; isotypes: BP n.v., NY [00126827 (ex LS)]).

11. Schmidtottia uliginosa (Wernham) Urb., Symb. Antill. 9:139. 1923. *Portlandia uliginosa* Wernham, J. Bot. 51. 320. 1913. Type: CUBA. Holguín: Trail from Río Yamaniguey to Camp Toa, 400 m, 22–26 Feb 1910, *J.A. Shafer 4018* (holotype: NY [00126762]; isotypes: A [00219728], F [No. 450880], US [00137337]).

***Distribution.*—**Cuba (Holguín: Sierras de Moa y Toa; Guantánamo).

Schmidtottia stricta Borhidi, Növenyrendsz. Novényföldr. Tansz., Eötvös Loránd Tudományegyet. Budapest 5:38. 1977, **syn. nov.** Type: CUBA. Holguín: Moa, Cerro de Miraflores, 11 May 1974, *M. Moncada & A. Borhidi HAC No. 27797* (holotype: HAC [ex EEAB, label with the heading "Estacion Experimental Agronomica Barker"]; isotype: BP n.v.).

Schmidtottia corymbosa Borhidi, Növenyrendsz. Novényföldr. Tansz., Eötvös Loránd Tudományegyet. Budapest 5:37 (1977), **syn. nov.** Type: CUBA. Oriente: Moa, camino de bajada a Coco, Mina Franklin, 20 Jul 1947, *Bro. León & Bro. Clemente HFC No. 23224* (**lectotype, here designated:** HAC [ex LS, annotated as "holotype" by Borhidi] (**Fig. 4**); isolectotypes: HAC, NY [00126818]).

***Notes.*—**Borhidi (1977:37), in the protologue of *Schmidtottia corymbosa* Borhidi, cited the material studied as "Cuba, Oriente, Moa, 20.06.1974, *León, Clemente y Néstor HFC No. 23224*, 20.07.1947, Holotipo: HAC!; isotipos: HAC!, NY!." The same type citation was reproduced by Borhidi et al. (2017:373). In both publications it was not specified which of the two HAC specimens is the holotype. The HAC specimen (ex LS), with the annotation "HOLOTYPUS Schmidtottia corymbosa Borhidi" handwritten by Borhidi, is here designated the lectotype of this name (**Fig. 4**).

Borhidi (1977) and Borhidi et al. (2017) separated *Schmidtottia corymbosa* from *S. uliginosa* by the 2–4-flowered corymbs of the former, versus the solitary flowers of the latter. Personal observations of natural populations showed that individuals with solitary flowers and 2–3-flowered inflorescences are present within the same populations. Hence, these two names are here treated as synonymous.

SCOLOSANTHUS

Vahl (1797 ["1796"]:11–12), described the genus *Scolosanthus* Vahl, based on *Catesbaea parviflora* Lam. (Lamarck, 1972). He did not provide any explanation regarding the etymology of the generic name. The origin of the generic name comes from the Greek words "scolos" (σκολος = hard) and "anthos" (άνθος = flower), probably referring to the small flowers present on the hard thorns of the plants. Correll and Correll (1982:1418) presented a doubtful explanation for the etymology of this name, as "Greek for "curved flower," with no obvious application." Vahl in the genus included the sole species *S. versicolor* Vahl, citing material collected by Ryan in Saint Croix (Lesser Antilles). *Scolosanthus* was positioned within the Chiococceae by most Rubiaceae specialists (Hooker, 1873a; Schumann, 1891; Bremer, 1992; Robbrecht, 1988, 1994; Delprete 1996). Paudyal et al. (2018) included 12 species of *Scolosanthus* in their molecular phylogenetic analysis, which were retrieved on a strongly supported clade, confirming the monophyly of this genus, as already indicated in the phylogenies of Motley et al. (2005). In Paudyal et al.'s (2018) phylogenies, the *Scolosanthus* clade is sister to the *Ramonadoxa cubensis* clade. *Scolosanthus* species are similar to *R. cubensis* only by the narrowly imbricate corollas, from which they differ by being stout, erect shrubs with bifurcate or trifurcate thorns (rarely absent), sometimes with flowers on them, and corollas a few mm long, while the latter is represented by scandent or climbing shrub or treelets to 5 m tall, lacking thorns, and corolla tubes 10–11 mm long. Numerous species and subspecies recognized by Borhidi (1983) and Borhidi et al. (2017) are of dubious distinctiveness, and are here treated as synonymous with species previously described. In the present synopsis, *Scolosanthus* is treated

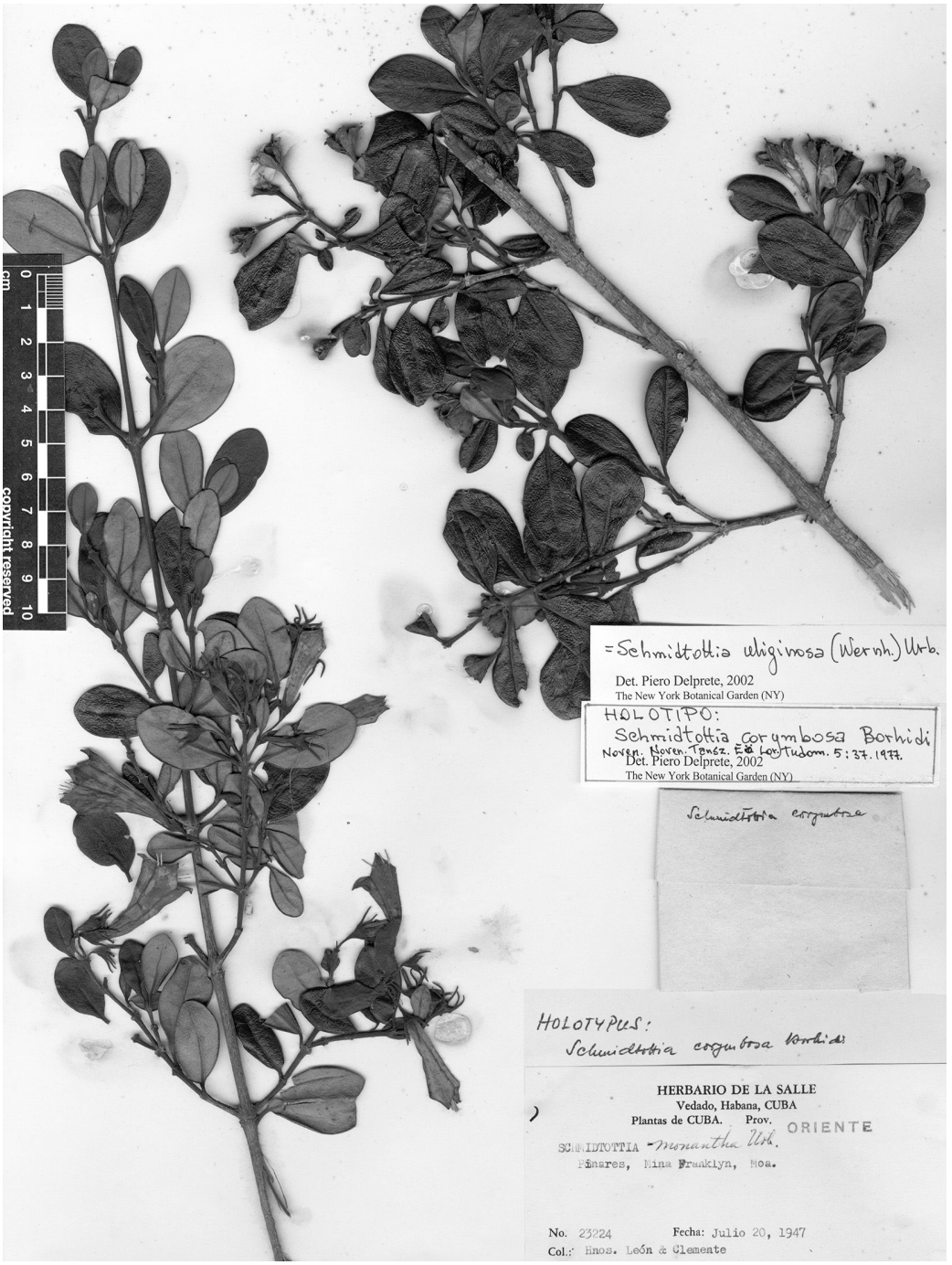

Fig. 4. Lectotype of *Schmidtottia corymbosa* Borhidi (*Bro. León & Bro. Clemente HFC No. 23224*, HAC [ex LS]). = *Schmidtottia uliginosa* (Wernham) Urb. Reproduced with permission by the Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana, Cuba.

as a genus of 28 species occurring in the Bahamas, and Greater and Lesser Antilles, with a high number of them endemic to Cuba.

Scolosanthus Vahl, Eclog. 1:11. 1796; Standley, N. Amer. Fl. 32(4):293–297. 1934; Liogier, Fl. Cuba 5:95–98. 1962; Correll & Correll, Fl. Bahama Arch. 1418, f. 620. 1982; Borhidi, Nord. J. Bot. 3:351–354. 1983; Borhidi, Acta Bot. Hung. 29:197–204, f. 2–7. 1983; Liogier, Fl. Española 7:414–419, f. 198-51. 1995; Borhidi et al., Rubiáceas Cuba 388–404, f. 118–124. 2017. Type: *Scolosanthus versicolor* Vahl [based on *Catesbaea parviflora* Lam. (1792), non Swartz (1788)].

1. Scolosanthus acanthodes (Spreng.) Urb., Symb. Antill. 1:481. 1899. *Eranthemum acanthodes* Spreng., Syst. Veg. 1:88. 1825. (See Standley, N. Amer. Fl. 32:297. 1934). Type: DOMINICAN REPUBLIC. Puerto Plata: Mun. Puerto Plata, comunidad El Toro, paraje Palo Indio, small mountain with serpentine soil, Finca del Señor Nicolas Domínguez, 19°51′N, 70°49′W, 50–150 m, 1 Aug 2001, *P.G. Delprete & T. Clase 7645* (**neotype, here designated:** NY [05154375]; isoneotypes: CAY [CAY253111], FTG [without barcode], JBSD [without barcode], MO [without barcode], US [without barcode]).

Distribution.—Hispañola.

Notes.—Sprengel (1825:88), in the protologue of *Eranthemum acanthodes* Spreng , indicated the collection locality as "Hispaniola," without citing any specimen or herbarium of deposit. According to Stafleu and Cowan (1985:806), Kurt Sprengel's herbarium was "dismembered and sold in small portions," and numerous specimens can be found in B-W, BP, FI, G, GOET, LE, PH, and PR. Urban (1899:481) along with the new combination *Scolosanthus acanthodes* (Spreng.) Urb., cited the material examined as "Hab. in Santo Domingo: Bertero n. 580," without indicating the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. After a search in Jstor Global Plants, Jacq, and in the TO herbarium, I did not find any original specimen associated with this name. Hence it is necessary to designate a neotype. The gathering *Delprete & Clase 7645* has duplicates distributed in several herbaria, and has flowers in anthesis and mature fruits. The specimen in NY is here designated the neotype of *E. acanthodes* Urb.

2. Scolosanthus acunae Borhidi & Muñiz, Acta Bot. Hung. 29:197, fig. 2. 1983. Type: CUBA. Pinar del Río: Loma Cajálbana, in declivibus abruptis orienti-septentrionalibus, fruticetis sempervirens, solo latosol serpentino, 400 m, 21 Nov 1974, *A. Borhidi, E. Del-Risco & R. Capote HFC No. 27694* (holotype: HAC [ex SV No. 27815]; isotype: BP n.v.).

Distribution.—Cuba (Pinar del Río: Sierra de Cajálbana).

Notes.—Borhidi and Muñiz (in Borhidi 1983:197–198), in the protologue of *Scolosanthus acunae* Borhidi & Muñiz, cited the type as "Holotypus: Cuba, Prov. Pinar del Rio, Loma cajálbana; […] A. Borhidi et R. Capote, 21 Nov. 1974, flor. et fruct. No. 27694 SV! Isotypi: SV! et BP!" The SV specimens are now integrated in HAC. There is only one specimen in HAC, ex SV No. 27815, which has a label with the annotation "Scolosanthus acuneae Borhidi et Muñiz, Falda NE de Cajalbana, Pinar del Rio, Borhidi, Del-Risco, Capote, 21/Nov. 1974" handwritten by Borhidi. This specimen is the holotype of this name.

3. Scolosanthus bahamensis Britton, Bull. New York Bot. Gard. 3:452. 1905. Type: BAHAMAS: New Providence, from Coppice along Village Road, 30 Aug 1904, *N.L. Britton & L.J.K. Brace 367* (holotype: NY [00115373]; isotypes: F [No. 171801], K [K000432632], US [00138531]).

Distribution.—Bahamas Archipelago.

4. Scolosanthus crucifer C. Wright, Anales Acad. Ci. Méd. Fís. Nat. Habana 6:126. 1869.

4a. Scolosanthus crucifer ssp. **crucifer** C. Wright, Anales Acad. Ci. Méd. Fís. Nat. Habana 6:126. 1869. Type: CUBA: Lagunas of Guama … chio (?), 3 Aug 1865, *C. Wright 377* (lectotype (Borhidi 1983:198): GOET [GOET010511]; isolectotypes: HAC n.v. [lost?], K [K000432631], NY [00115374], S n.v. [not there?], US [00433459]).

Distribution.—Cuba (Pinar del Río, Holguín, Villa Clara, Matanzas).

Notes.—Wright (1869:126), in the protologue of *Scolosanthus crucifer* C. Wright, cited two of his own gatherings from Cuba, *Wright 377* and *Wright 3583*, and cited "*Randia Sagreana Gris.*" Borhidi (1983:198) cited the type of this name as "Holotypus: Cuba; Ch. Wright 377; Lagunas of Guama … Chio (?) 3. aug. 1865. GOET—isotypi S! NY! HAC! US!" This citation is an inadvertent lectotypification of a specimen at GOET. In GOET there is a single specimen of *Wright 377*, with barcode GOET010511. It has a label with a short species description, handwritten by Wright. Another label has the heading "Plantae Cubenses Wrightianae" and the

number "377" handwritten by an unknown author. The specimen consists of three small branches with numerous minute leaves, and is the lectotype of *S. crucifer*.

Scolosanthus crucifer var. *acutus* Borhidi, Acta Bot. Hung. 29:198. 1983, **syn. nov.** Type: CUBA. Villa Clara: LasVillas, Sabanas de Motembo, 9–10 Aug 1930, *Bro. León & A. Loustalot 9340* (holotype: HAC!; isotypes: GH [00094505], NY [01185462]).

Scolosanthus crucifer var. *subtomentosus* Borhidi, Acta Bot. Hung. 29:198. 1983, **syn. nov.** Type: CUBA. Matanzas: San Adrián, Cuabal de Espinal, 11 Apr 1927, *J.T. Roig & Bro. León 4245* (holotype: HAC [ex LS]; isotype: NY n.v.).

***Notes.*—**In GH there is the specimen *Bro. León LS No. 12971*, barcode 00094506, collected on 28 February 1972, annotated as isotype of *Scolosanthus crucifer* var. *subtomentosus* Borhidi by Borhidi, but the type of this name is *Roig & León 4245*, as cited by Borhidi (1983:198).

Borhidi (1983:198) recognized four varieties under *Scolosanthus crucifer*: 1) var. *crucifer*, with leaves oblong-elliptic, 7–15 mm long, obtuse or round at apex, glabrous throughout; 2) var. *acutus* Borhidi, with leaves lanceolate, 7–15 × 5–8 mm, shortly acuminate and acute-mucronate at apex, glabrous throughout; 3) var. *microphyllus* Borhidi, with leaves minute, elliptic or suborbicular, 2–6 × 1.5–4 mm, glabrous throughout, margins strongly revolute; 4) var. *subtomentosus* Borhidi, with leaves elliptic, 7–12 mm long, shortly tomentulose below. The typical variety and the varieties *acutus* and *subtomentosus* have overlapping characters, in terms of leaf dimensions and vestiture. Whereas, variety *microphyllus* is distinct from the other varieties in having minute leaves with revolute margins, and is here elevated to subspecies rank (See below).

4b. Scolosanthus crucifer ssp. **microphyllus** (Borhidi) Delprete, **comb. et stat. nov.** *Scolosanthus crucifer* var. *microphyllus* Borhidi, Acta Bot. Hung. 29:198. 1983. Type: CUBA. Matanzas: Canasí, Cuabal de Espinal, 16–18 Aug 1927, *Bro. León & J.B. Acuña LS No. 13066* (holotype: HAC [ex LS]; isotypes: GH [00094504], NY [01185463]; possible isotype: HAC [ex SV No. 24693]).

***Distribution.*—**Cuba (Matanzas, Villa Clara).

***Notes.*—**Borhidi (1983:198) cited the type of *Scolosanthus crucifer* var. *microphyllus* Borhidi as "Holotypus: León 13066 HAC; Prov. Matanzas. Cuabal del Espinal, Canasi; Leg.: León et Acuña 16–18 Aug 1927.—Isotypus: Acuña 24693, HAC!" The holotype specimen, *León & Acuña 13066*, was originally in LS, and is now integrated in HAC.

In HAC there is a second specimen, which was originally in SV, which has a label with herbarium number "24693" and the typewritten annotations "Scolosanthus crucifer Wr. ex Sauv., Cuabal del Espinal, Canasí, Prov. Matanzas, Acunã y León," without collection date. Just above that label is affixed another label with the annotation "Scolosanthus crucifer var. microphyllus Borhidi, A. Borhidi, 1979" handwritten by Borhidi. Its label reports the same locality and the same collectors as the holotype specimen, but reports the gathering as "Acuña 24693," hence it is as a possible isotype.

5. Scolosanthus densiflorus Urb., Symb. Antill. 3:381. 1903.

5a. Scolosanthus densiflorus Urb. ssp. **densiflorus**, Symb. Antill. 3:381. 1903. Type: HAITI: Gonaïves, Morne Bonpère, 600 m, Jun 1901, *W. Buch 728* (**lectotype, here designated:** K [K000432630]).

***Distribution.*—**Haiti (Gonaïves).

***Notes.*—**Urban (1903:381), in the protologue of *Scolosanthus densiflorus* Urb , cited the material studied as "Haiti prope Gonaïves, Morne Bonpère, 600 m. alt., m. Junio flor.: Buch n. 728," without citing the herbarium of deposit. The original material in B studied by Urban was destroyed during WWII. Borhidi et al. (2017:392) cited the type of this name as "Tipo: Haiti, prope Gonaïves in Morne monpère, 600 m, *Buch 728*, holotipo: B†, isotipos: NY, US." In K there is a specimen, with barcode K000432630, with the heading "Herbarium Krug et Urban" and the annotation "Scolosanthus densiflorus Urb." handwritten by Urban. This specimen consists of two small branches, one of them with flower buds. In the envelope affixed on the sheet are included several leaves, several flower buds, and a flower in anthesis. This specimen is here designated as the lectotype of this name.

5b. Scolosanthus densiflorus subsp. **maestrensis** (Alain) Borhidi, Bot. Közlem. 58:177. 1971. *Scolosanthus maestrensis* Alain, Contr. Ocas. Mus. Hist. Nat. La Salle 17:11. 1959. Type: CUBA. Granma: Sierra Maestra, Alto de la Valenzuela, márgenes del Arroyo Peladero, 5–8 Apr 1955, *M. López Figueiras 2181* (holotype: HAC [ex SV]; isotypes: HAJB [HAJB G 000843], NY [00115394], US [0013535]).

***Distribution.*—**Cuba (Granma: Sierra Maestra; Guantánamo: Mesa de Prado; Santiago de Cuba).

6. Scolosanthus ekmanii Borhidi, Nord. J. Bot. 3:351, fig. 1. 1983. TYPE: CUBA. SANTIAGO DE CUBA: Daiquirí, "in collibus calcareis and Papayo [Loma del Papayo]," 18 Nov 1916, *E.L. Ekman 8391* (HOLOTYPE: S [No. S05-1021]; ISOTYPES: F n.v., UPS n.v., US [00433461]).

Distribution.—Cuba (Santiago de Cuba).

7. Scolosanthus grandifolius Krug & Urb., in Urban, Symb. Antill. 1:442. 1899. TYPE: PUERTO RICO: Prope Maricao, Monte Alegrillo, 7 Dec 1884, *P.E.E. Sintenis 249* (**LECTOTYPE, here designated:** K [K000432629NY]; ISOLECTOTYPES: GH [00094508], HGB [HGB-521009], NY [00115376], US [00138532]).

Distribution.—Puerto Rico.

Notes.—Krug and Urban (in Urban, 1899:442–443), in the protologue of *Scolosanthus grandifolius* Krug & Urb., cited the material studied as "in Portorico prope Maricao in sylvis montis Alegrillo, m. Dec. flor.: Sintenis n. 249" without citing the herbarium of deposit. The material in B studied by Krug and Urban was destroyed during WWII. Duplicates of *Sintenis 249* are present in several herbaria. All of them have labels with the printed annotation "det. I. Urban." The K specimen with barcode K000432629, consist of two branches with medium-sized leaves, and long, curved thorns, and is here designated as the lectotype of this name.

8. Scolosanthus granulatus Urb., Symb. Antill. 9:164. 1923. TYPE: CUBA. GUANTÁNAMO: Monte Libanon, San Fernández, 21 Dec 1919, *E.L. Ekman 10283* (**LECTOTYPE, here designated:** S [No. S05-1025]; ISOLECTOTYPE: HAC [No. 28096, ex S]).

Distribution.—Cuba (Guantánamo: Monte Libano).

Notes.—Urban (1923a:164), in the protologue of *Scolosanthus granulatus* Urb., cited the material studied as "[Cuba] Prov. Oriente prope Guantánamo in Monte Libanon ad San Fernández in solo calcareo, m. Dec. flor.: [Ekman] N. 10283," without citing the herbarium of deposit. The material in B studied by Urban was destroyed during WWII. Borhidi et al. (2017:393) cited the type of this name as "Tipo: Cuba, Oriente prope Guantánamo, […], *Ekman 10283*. Holotipo: B†, lectotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017) lectotype designation is not valid. In S there is a specimen, with accession number S05-1025, which has a label with the annotation "Scolosanthus granulatus Urb. (typus)" handwritten by Urban. It consists of two unarmed branches with numerous minute leaves, and without flowers. This specimen is here designated as the lectotype of this name.

9. Scolosanthus hirsutus Borhidi, Acta Bot. Hung. 29:198. 1983. TYPE: CUBA. GUANTÁNAMO: Costa Sur de Baracoa, San Antonio del Sur, 4 km W del pueblo, 200–400 m, 10 Feb 1976, *A. Areces, J. Bisse, J. Gutiérrez & H. Manitz HAJB No. 29922* (HOLOTYPE: HAJB [HAJB G 000842]; ISOTYPES: BP n.v., HAC [ex SV], JE [JE00006001]).

Distribution.—Cuba (Guantánamo: Baracoa).

10. Scolosanthus hispidus Borhidi, Acta Bot. Hung. 29:199, fig. 3. 1983. TYPE: CUBA. GUANTÁNAMO: Maisí, coastal thickets, Jul 1938, *Bro. León & W. Seifriz HAC No. 18110* (HOLOTYPE: HAC [ex SV]; ISOTYPE: NY [00115377]).

Distribution.—Cuba (Guantánamo: Mesa de Maisí).

11. Scolosanthus howardii Borhidi, Acta Bot. Hung. 29:199, fig. 4. 1983. TYPE: JAMAICA. TRELAWNY: Cockpit Country, dry rocky hillsides, 500 m, 4 Jul 1956, *R.A. Howard & G.R. Proctor 14386* (HOLOTYPE: A [00094509]).

Distribution.—Jamaica.

Notes.—Borhidi (1983:199–200), in the protologue of *Scolosanthus howardii* Borhidi, cited the type as "Holotypus: Jamaica, Prov. Trelawny Ramgoat Cave district, […] Leg. R.A. Howard and G.R. Proctor 14386, 4 Jul. 1956," without citing the herbarium of deposit. In A there is a sole specimen of *Howard & Proctor 14386*, which was annotated as "Holotypus! Scolosanthus howardii Borhidi" by Borhidi in 1980. That specimen is the holotype of this name.

12. Scolosanthus leonardii Alain, Brittonia 20:160. 1968. TYPE: HAITI: vicinity of Mole St. Nicolas, road up banks of Mole gorge to Bombardopolis, 13–19 Feb 1929, *E.C. Leonard & G.M. Leonard 13200* (HOLOTYPE: US [00138533 (annotated as "isotype" by Borhidi)]; ISOTYPES: GH [00094510], NY [00115390 (annotated as "holotype" by Borhidi)]).

Distribution.—Haiti.

Notes.—Alain Liogier (1968:160–161), in the protologue of *Scolosanthus leonardii* Alain, clearly stated that the type specimen of this name is in US, which is the holotype. Borhidi erroneously annotated the US specimen as the isotype, and the NY specimen as the holotype.

13. Scolosanthus liogieri Borhidi, Acta Bot. Hung. 29:200. 1983. TYPE: DOMINICAN REPUBLIC. SAN JUAN: Loma El Campanario, Ciénaga de la Culata, in cloud forest, 1650–1850 m, 24 Sep 1969, *Bro. Alain H. Liogier 16051* (HOLOTYPE: NY [00115392 (annotated as "isotype" by Borhidi)]; ISOTYPE: US [00433462 (annotated as "holotype" by Borhidi)]).

Distribution.—Dominican Republic.

Notes.—Borhidi (1983:200–201) cited the type of *Scolosanthus liogieri* Borhidi, as "Holotypus: Alain 16051. Hispaniola, Rep. Dominicana; Loma El Campanario, Ciénaga de la Culata, […] NY! Isotypus: US!" However, he annotated the NY specimen as isotype, and the US specimen as the holotype. According to the *Code*, the information presented in the publication regarding type designation is the valid one, and annotations on specimens have no nomenclatural validity.

14. Scolosanthus lucidus Britton, Mem. Torrey Bot. Club 16:112. 1920. TYPE: CUBA. HOLGUÍN: Moa Bay, E of Río Moa, 2–3 Jan 1911, *J.A. Shafer 8355* (**LECTOTYPE, here designated:** NY [00115393]; ISOLECTOTYPES: A [00094511], NY [00115392], US [00138534]).

Distribution.—Cuba (Holguín, Guantánamo).

Notes.—Britton (1920:112), in the protologue of *Scolosanthus lucidus* Britton, cited the type as "Moa Bay, east of Río Moa, Oriente (*Shafer 8355, type*)" without indicating the herbarium of deposit. Borhidi et al. (2017:396) cited the type of this name as "Tipo: Cuba; prov. Oriente, Moa Bay, […], J.A. Shafer 8355. Holotipo: NY. Isotipo: US." According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017) lectotype designation is not valid.

In NY, where Britton worked, there are two specimens of *Shafer 8355*. The specimen with barcode 00115393, has a label with the annotation "Type. Scolosanthus lucidus Britton" handwritten by Britton. This specimen consists of one branch with numerous minute, lucid leaves and several flowers, and is here designated as the lectotype of *S. lucidus*.

The other NY specimen, with barcode 00115392, has a label with the annotation "Scolosanthus lucidus Britton" handwritten by Britton. This specimen consists of two branches with numerous minute, lucid leaves, and several flowers, and is an isolectotype.

15. Scolosanthus moanus Borhidi & Muñiz, Acta Bot. Hung. 29:201. 1983. TYPE: CUBA. HOLGUÍN: Moa, Breñales de Playa Vaca, 9 Nov 1945, *J. Acuña 13381* (HOLOTYPE: HAC [ex SV]; ISOTYPE: HAJB [HAJB G 000844]).

Distribution.—Cuba (Holguín: Moa).

16. Scolosanthus multiflorus (Sw.) Krug & Urb.

16a. Scolosanthus multiflorus ssp. **multiflorus**, in Urban, Symb. Antill. 1:443. 1899. *Ixora multiflora* Sw., Prodr. 30. 1788. TYPE: JAMAICA: without locality, s.d, *W.T. Marsh 1679* (NEOTYPE (Borhidi 1983: 201): GOET [GOET067223]; ISONEOTYPE: GH n.v.; POSSIBLE ISONEOTYPE: NY [00115395]).

Distribution.—Jamaica.

Notes.—Swartz (1788:30), in the protologue of *Ixora multiflora* Sw., indicated the collection locality as "Jamaica," without citing any specimen. Krug and Urban (1899:443) transferred this name to *Scolosanthus*, with the new combination *S. multiflorus* (Sw.) Krug & Urb. A general search in numerous herbaria did not retrieve any original specimen collected by Swartz in Jamaica.

Borhidi (1983:201) cited the type of *Scolosanthus multiflorus* ssp. *multiflorus* [Basionym: *Ixora multiflora* Sw.], as "Lectotypus: March, [!sic, W.T. Marsh] 1679: Jamaica GOET; Isolectotypus: GH." In absence of Swartz's original material, Borhidi's (1983) citation is here treated as an inadvertent neotype designation. According to Vegter (1976:505), William Thomas Marsh collected about 2000 specimens in Jamaica in 1854–1862. In GOET there is a specimen, with barcode GOET067223, which has a label with the annotation "1679 Scolosanthus versicolor var. fol. u. Jamaica, Mr. Marsh." It has a second label with the annotation "Scolosanthus

multiflorus (Sw.) Krug et Urb." handwritten by Borhidi. It consists of six small branches with numerous leaves and numerous inflorescences with flowers in anthesis. This specimen is the neotype of *I. multiflora*.

In NY there is a specimen with barcode 00115395, which has a label with the annotations "Com. ex Hb. Hooker Kew 1866, Griseb.!" handwritten by an unknown author, and "Scolosanthus versicolor Jamaica, Marsh" handwritten by Marsh. This specimen is a possible isoneotype of *Ixora multiflora*.

Scolosanthus versicolor Griseb., Fl. Brit. W. Ind. 335. 1861, *nom. illeg. superfl.* [non *S. versicolor* Vahl, Eclog. Amer. 1:11. 1797 ("1796")]
Notes.—Grisebach (1861:335), in the protologue of *Scolosanthus versicolor* Griseb., cited *S. versicolor* Vahl, and *Ixora multiflora* Sw., hence Grisebach's name is superflous and illegitimate.

16b. Scolosanthus multiflorus ssp. **hirticalyx** Borhidi, Acta Bot. Hung. 29:201. 1983. TYPE: JAMAICA: without locality, s.d., *W.T. Marsh 1716* (HOLOTYPE: GOET [GOET067222]; ISOTYPE: GH [00094513]).

Distribution.—Jamaica.

Notes.—Borhidi (1983:201–202), in the protologue of *Scolosanthus multiflorus* ssp. *hirticalyx* Borhidi, cited a specimen as "Holotypus: March, [!sic, W.T. Marsh], 1716; Jamaica, GOET." In GOET there is a specimen, with barcode GOET067222, which has a label with the annotation "Scolosanthus versicolor V. Jamaica. Marsh 1716." It has a second label with the annotation "Scolosanthus multiflorus (Sw.) Krug et Urb. ssp. hirticalyx Borhidi" handwritten by Borhidi. This specimen consists of a branch with numerous leaves and numerous inflorescences with flowers in anthesis, and is the holotype of this subspecific name.

In GH there is a specimen, with barcode 00094513, which has a label with the annotation "Scolosanthus versicolor Vahl, Jamaica, Marsh" handwritten by Marsh. Above that label is affixed another label with the annotation "HOLOTYPUS! Scolosanthus multiflorus (Sw.) Kr. et Urb. ssp. hirticalyx Borhidi" handwritten by Borhidi. This specimen is an isotype of this name.

17. Scolosanthus nannophyllus Borhidi, Acta Bot. Hung. 29:202. 1983. TYPE: CUBA. GUANTÁNAMO: Manigua de la 2da terraza de Maisí, 19 Aug 1939, *Bro. León & Bro. Marie-Victorin LS No. 17111* (HOLOTYPE: HAC [ex LS]; ISOTYPE: NY [00115396]).

Distribution.—Cuba (Guantánamo: Terraza de Maisí).

18. Scolosanthus nipensis Borhidi ex Delprete, **sp. nov.** (**Fig. 5**). TYPE: CUBA. HOLGUÍN: Sierra de Nipe, Charrascal de La Cueva, 27–31 May 1960, *M. López Figueiras 1033* (HOLOTYPE: HAC [specimen "A"]; ISOTYPE: HAC [specimen "B"]).

Distribution.—Cuba (Holguín: Sierra de Nipe).

Diagnosis.—*Scolosanthus nipensis* Borhidi ex Delprete is similar to *S. acunae* because of the minute leaves and the narrow corollas with tubes 2.5–3 mm long. The former differs from the latter by being unarmed (vs. with trichotomous thorns), calyx completely glabrous (vs. ciliate), corolla 4-merous (vs. commonly 3-merous, rarely 4-merous), and style 3.7 mm long (vs. 4.5–5 mm long).

Description.—**Shrub**, unarmed; height unknown. *Stipules* deltoid, 0.5–06 mm long, sometimes splitting into two narrowly triangular units. **Leaves** subsessile (petioles to 0.5 mm long); blades obovate, 8.5–9.5 x 3.5–4.5 mm, acute at base, round at apex, lucid and glabrous above, scabrellous below, the secondary veins not visible (imbedded in the lamina), the margins minutely revolute. **Flowers** axillary, 2–4 per axil, glabrous; pedicels 0.5–0.6 mm long; hypanthium oblong-obovoid, 1–1.2 mm long; calyx denticulate, teeth deltoid, 0.2 mm long. **Corolla** tube narrowly cylindrical at basal 2/3 and narrowly flaring at distal 1/3, glabrous, 3–3.2 mm long; lobes ovate-deltoid, 1.2 mm long, reflexed at anthesis. *Stamens* inserted about 1 mm below the corolla mouth; filaments 0.5 mm long; anthers linear, 1.3 mm long, apically mucronate. *Style* exserted, linear, 3.7 mm long. **Fruit** unknown.

Notes.—In HAC there are two specimens of *López Figueiras 1033*. The specimen annotated "A" (**Fig. 5**) by Delprete is the holotype, and the specimen annotated "B" by Delprete is the isotype of this name.

19. Scolosanthus portoricensis Borhidi, Acta Bot. Hung. 29:202. 1983. TYPE: PUERTO RICO: Sosua State Forest, serpentine barrens, 300–400 m, 26 Jun 1963, *Bro. Alain Liogier [A.H. Liogier] 9742* (HOLOTYPE: GH [00094514]; ISOTYPE: NY [00115397]).

Distribution.—Puerto Rico.

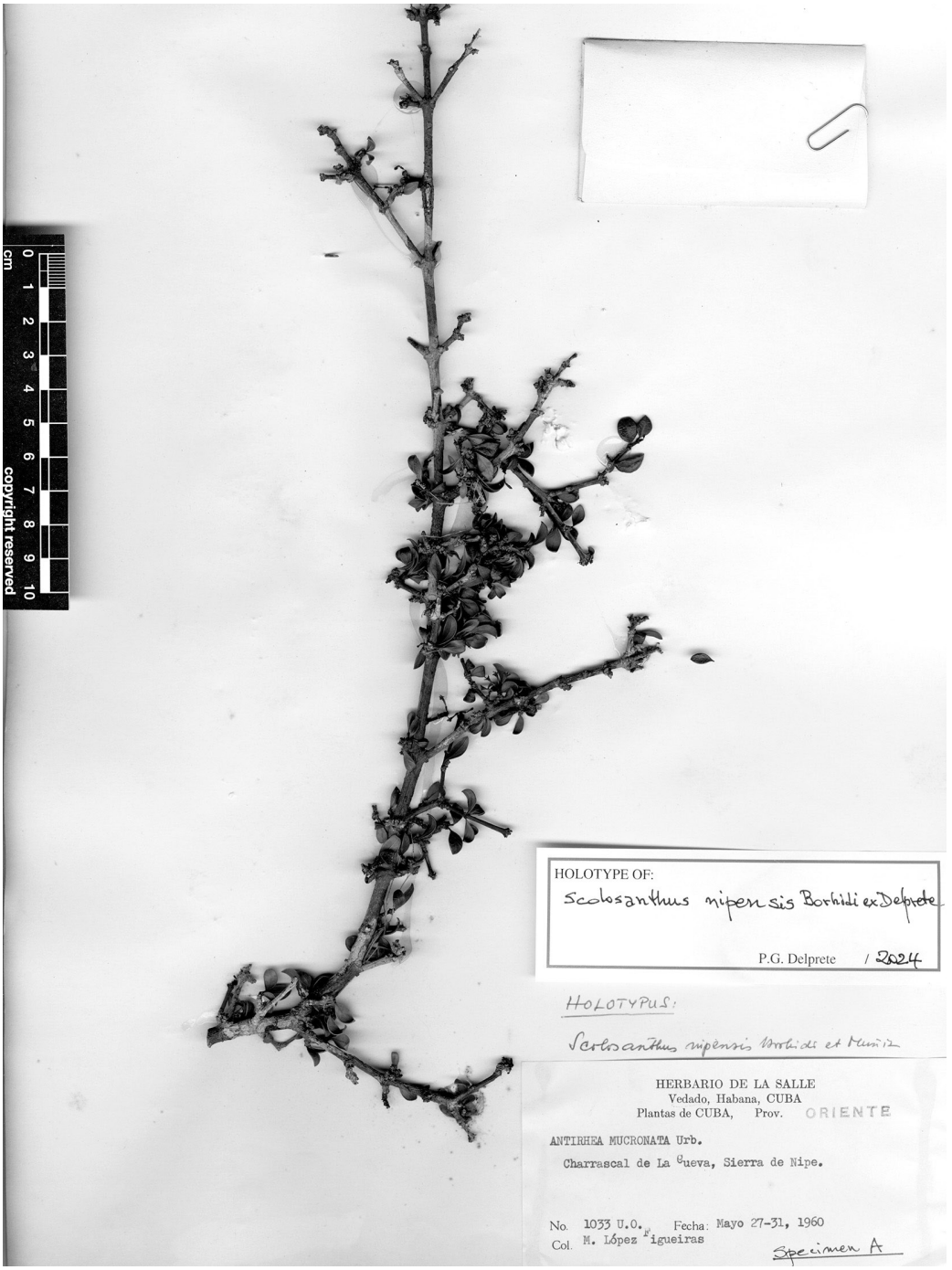

Fig. 5. Holotype of *Scolosanthus nipensis* Borhidi ex Delprete, sp. nov. (*López Figueiras 1033*, HAC specimen "A"). Reproduced with permission by the Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana, Cuba.

20. Scolosanthus pycnophyllus Borhidi, Acta Bot. Hung. 29:203. 1983. Type: CUBA. Holguín: Pico Sur del Cerro Galano, entre La Palma y Limones, 15 Aug 1975, *J. Urbino s.n. [HAC No. 27983]* (holotype: HAC [ex EEAB No. 28115]).

Distribution.—Cuba (Holguín: Cerro Galano).

Notes.—Borhidi (1983:203) cited the type of *Scolosanthus pycnophyllus* Borhidi as "Holotypus: 27983 HAC. Cuba: Prov. Holguín (Oriente) Pico sur del Cerro Galeano, entre La Palma y Limones.—Leg.: J. Urbino, 15 Aug 1975." In HAC there is a sole specimen annotated as "*Scolosanthus pycnophyllus* Borhidi, HOLOTYPUS! A. Borhidi, 1977." The label of this specimen has the heading "ESTACION EXPERIMENTAL AGRONOMICA—HERBARIO CH. F. BARKER," which means that was originally in the EEAB Herbarium (Regalado Gabancho et al. 2008). It also has the handwritten annotations: "28115, […] Pico del Cerro, Holguín, Oriente, Jacobo Urbino, 15 Aug 1975." This specimen was originally in EEAB, and is now integrated in HAC. It consists of two branches, with sturdy cruciform thorns, and numerous minute leaves, and is the holotype of *S. pycnophyllus*.

21. Scolosanthus reticulatus Borhidi, Acta Bot. Hung. 29:203. 1983. Type: CUBA. Holguín: Sierra de Nipe, Salto del Río Guayabo, Pinares de Mayari, 27–31 May 1960 (fl), *M. López Figueiras 973* (holotype: HAC [ex LS]; isotypes: BP n.v., HAJB [HAJB G 000845]).

Distribution.—Cuba (Holguín: Sierra de Nipe).

22. Scolosanthus roulstonii Proctor, Fl. Cayman Island, 2nd ed.:620, figs. 1–2. 2012. Type: CAYMAN ISLANDS: Grand Cayman, bluff at Little Salt Creek, 19 Nov 2005, *P.A. B. Stafford s.n.* (holotype: IJ [IJ 000038672]).

Distribution.—Cayman Islands.

23. Scolosanthus selleanus Urb. & Ekman, in Urban, Ark. Bot. 20A:60. 1926. Type: HAITI: Massif de la Selle, Morne La Visite, on the slope of the siliceous conglomerate, 2150–2200 m, s.d., *E.l. Ekman H-1460* (**lectotype, here designated:** S [S05-1031]; isolectotypes: G [G00436774], GH [00094515], K [K000432628], US [00827366]).

Distribution.—Haiti (Massif de la Selle).

Notes.—Urban and Ekman (in Urban, 1926:60–61), in the protologue of *Scolosanthus selleanus* Urb. & Ekman, cited the material studied as "Massif de la Selle in Morne La Visite in conglomeratis siliceis 2,150–2,200 m alt , m. Aug fl. et fr.: [Ekman] H 1460," without citing the herbarium of deposit. The material in B studied by Urban and Ekman was destroyed during WWII. In S there is a specimen of *Ekman H-1460*, with accession number S05-1031, which has a label with the annotation "Scolosanthus Selleanus Urb. et Ekm." handwritten by Urban. The specimen consists of three branches with numerous minute leaves, some flower buds, and a few fruits. This specimen is here designated as the lectotype of this name.

24. Scolosanthus strictus Urb , Symb. Antill. 9:533. 1928. Type: CUBA. Guantánamo: Prope Guantánamo, ad Caimanera, in limestone terraces, 24 Nov. 1922, *E.L. Ekman 15768* (**lectotype, here designated:** S [S05-1034]; isolectotypes: F [No. 605137], G [G00436773], NY [00115399]).

Distribution.—Cuba (Guantánamo).

Notes.—Urban (1928:533), in the protologue of *Scolosanthus strictus* Urb., cited the material studied as "Prov. Oriente prope Guantánamo ad Caimanera in calcareis, m. Nov. in alab.: [Ekman] n. 15768," without citing the herbarium of deposit. The material in B studied by Urban was destroyed during WWII. Borhidi et al. (2017:401) cited the type of this name as "Tipo: Cuba: Oriente, […], Ekman 15768. Holotipo: B†, lectotipo: S!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017) lectotype designation is not valid.

In S there is a specimen of *Ekman 15768*, with accession number S05-1034, which has a label with the annotation "Scolosanthus strictus Urb. (typus)" handwritten by Urban. This specimen, consisting of three branches with numerous minute leaves, and some flower buds, is here designated as the lectotype of this name.

25. Scolosanthus subsessilis Alain, Phytologia 25:278. 1973. Type: DOMINICAN REPUBLIC. Santiago: Jaiquí Picado, 20 mi W of Santiago, 300–400 m, 26 May 1969, *Bro. Alain [A.H. Liogier] 15368* (holotype: NY [00115398]; isotypes: GH [00094507], US [00433460]).

Distribution.—Dominican Republic.

Notes.—Alain Liogier (1973:278–270), discussed the similarities of *Scolosanthus subsessilis* Alain with other species as, "Among the small-leaved *Scolosanthus*, *S. subsessilis* has one of the smallest corollas. The nearest species are *S. wrightianus* (Griseb.) C. Wright, with leaves 7–14 mm long, the flowers short-pedicellate, the calyx lobes deltoids, the anthers 2 mm long, according to Standley; *S. versicolor* Vahl has apiculate leaves, the calyx 2–2.5 mm long, the corolla violet or yellow, 6–7 mm long. From *S. densiflorous* Urb., it is readily distinguished by its flowers on lateral branches, instead of being on the spines; *S. densiflorous* has usually larger leaves (up to 3 cm long), the calyx lobes semiorbicular, the corolla lobes almost as along as the tube." The diagnostic features presented by Alain Liogier are here followed, and *S. subsessilis* is here recognized as a distinct species endemic to calcareous soils of Dominican Republic.

26. Scolosanthus triacanthus (Spreng.) DC., Prodr. 4:484. 1830. *Catesbaea triacantha* Spreng., Neue Entdeck. Pflanzenk. 3:47. 1822. TYPE: DOMINICAN REPUBLIC: without locality, s.d. [1820], *C. Bertero s.n.* (**NEOTYPE, here designated:** M [M-0189390]; ISONEOTYPES: MO [No. 2091990], MPU [MPU021756], S [No. S07-14401], TO).

Distribution.—Dominican Republic.

Notes.—Sprengel (1822:47), in the protologue of *Catesbaea triacantha* Spreng., cited the collection locality as "Hispaniola," without citing the collector, collection number or herbarium of deposit. Sprengel personal herbarium was dismantled and sold to numerous specialists. A considerable portion of Sprengel's specimens was in B, and was destroyed during WWII. As a result of a general search in numerous herbaria, five specimens associated with this name were retrieved in M, MO, MPU, S, and TO, although none of them have evidence that they were examined by Sprengel. The M specimen, barcode M-0189390, has a label with the annotation "Catesbaea triacantha Spr. S.D." handwritten by Balbis, and "In Sto. Domingo legt. Bertero, comct. Balbis" handwritten by an unknown author. The specimen consists of a small, ramified branch with numerous small leaves and ternate spines, and is here designated as the neotype of *C. triacantha*.

In TO there is a specimen with the annotation "Catesbaea triacantha Spr. in litt. ex S. Domingo D. Bertero 1820" handwritten by Balbis. The specimen consists of a densely ramified branch with numerous small leaves and numerous flowers in anthesis. The TO specimens do not have barcode or accession numbers. This specimen is an isoneotype of *Catesbaea triacantha* Spreng.

27. Scolosanthus versicolor Vahl, Eclog. Amer. 1:11. 1797 ["1796"]. TYPE: ST. CROIX: without locality, s.d., *J. Ryan s.n.* (**LECTOTYPE, here designated:** C [C10018377]; ISOLECTOTYPES: BR [000000561859], C [C10018376]; POSSIBLE ISOLECTOTYPE: B-W [B –W 02797 -01 0]).

Distribution.—Dominican Republic, Puerto Rico, St. Croix.

Notes.—Vahl (1797 ["1796"]:11–12), in the protologue of *Scolosanthus versicolor* Vahl, cited "*Catesbaea parviflora*. La Marck Tableau Encycl. et Meth. Botan. tab. 67.—In insula St. Crucis legit *Ryan* ɮ." In Lamarck's (1791) *Tableau Encyclopédique et Méthodique. Requeil de Planches de Botanique*, Plate 67, figure 2, is represented "Catesbaea parviflora" with a branch with small leaves, subtended by pairs of acicular thorns, and the details of a dissected corolla, style, anthers, and a fruit in side view and in cross section. This plate represents original material of *S. versicolor*. According to the *Code*, a specimen should be preferred over an illustration for the typification and application of a name.

According to Stafleu and Cowan (1986:628), the original material studied by Martin Vahl is in C. In C there are two specimens annotated by Vahl with this name. The specimen with barcode C10018377, on the back of the sheet has the annotation "Scolosanthus versicolor Dr Ryan" handwritten by Vahl, and the stamp "HB. VAHLII." On the front of the sheet is affixed a branch with numerous minute leaves, bifurcate thorns in many nodes, and a few flowers in anthesis. This specimen is here designated as the lectotype of *S. versicolor*.

The C specimen with barcode C10018376, on the back of the sheet has the annotations "Scolosanthus versicolor I" and "West ex Ins. St. Crucis" handwritten by Vahl, and the stamp "HB. VAHLII." On the front of the sheet is affixed a branch with numerous minute leaves, bifurcate thorns in many nodes, and numerous minute fruits. This specimen is an isolectotype.

In BR there is a specimen with barcode 000000561859, which has a label with the annotation "Scolosanthus versicolor mihi ex Ins. St. Crucis" handwritten by Vahl. The specimen consists of a branch

with numerous minute leaves, bifurcate thorns in many nodes, and several flower buds and flowers in anthesis. This specimen is an isolectotype.

In B-W there is a specimen with barcode B –W 02797 -01 0, bearing the annotation "Vahl. W" handwritten by Willdenow. This specimen consists of a branch with numerous minute leaves, bifurcate thorns in many nodes, and a few minute fruits. This specimen is a possible isolectotype of *S. versicolor*.

Although the type of this species is from St. Croix, there is no mention of *Scolosanthus* in Howard's (1989) *Flora of the Lesser Antilles*.

28. Scolosanthus wrightianus (Griseb.) Wright, in Sauv., Anal. Acad. Ci. Habana 6:126. 1869. *Randia wrightiana* Griseb., Cat. Pl. Cub. 122. 1866. Type: CUBA. Guantánamo: "Cuba Or.," s.d. [1861], *C. Wright 2715* (**lectotype, here designated:** GOET [GOET010513]; isolectotypes: GH [00094516], HAC [3 sheets, one sheet ex SV], MO [No. 2091759], S [No. S05-1195], YU [YU.001806]).

Distribution.—Cuba (Guantánamo).

Notes.—Grisebach (1866:122–123), in the protologue of *Randia wrightiana* Griseb., cited two Cuban gatherings collected by Wright as "Cuba or. (Wr. 2660, 2715)" without indicating the herbarium of deposit. For information regarding Grisebach's original specimens, see notes under *Phialanthus myrtilloides*. Borhidi et al. (2017:401) cited the type of *Randia wrightiana* as "Tipo: Cuba Oriental, Sta Ana, Mt. Toro, C. Wright 2660 p.p. Holotipo: GOET, isotipos: GH, HAC." According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al. (2017) "holotype" citation cannot be treated as an inadvertent lectotypification.

In GOET there are two specimens annotated as *Randia wrightiana* corresponding with the two gatherings cited by Grisebach. The specimen *Wright 2715* with barcode GOET010513 has a label with the heading "Plantae Cubenses Wrightianae" and the annotation "2715. Randia wrightiana m." handwritten by Grisebach. This specimen consists of a branch with numerous leaves, bifurcate thorns with one or two nodes, and a few flower buds. This specimen is here designated as the lectotype of *Randia wrightiana*.

The specimen *Wright 2660* in GOET, with barcode GOET010512, has a label with the heading "Plantae Cubenses Wrightianae" and the annotation "2660. Randia wrightiana m." handwritten by Grisebach. This specimen consists of a branch with numerous leaves, bifurcate thorns with one or two nodes, and no flowers. In the envelope affixed on the sheet are included numerous leaves and several minute fruits. In the image of this specimen available in Jstor Global Plants is included an insert of an image showing a large fruit, which does not belong to any species of *Scolosanthus*.

SCOLOSANTHUS EXCLUDED TAXA

Scolosanthus parviflorus (Sw.) Wright, in Sauv., Anal. Acad. Ci. Habana 6:126. 1869.
= *Catesbaea parviflora* Sw. (See above).

Scolosanthus sagraenus (A. Rich.) Millsp., Publ. Field Mus., Bot. 2(1):102. 1900 (as "Sagraeanus"). *Gardenia sagraeana* A. Rich. in R. de La Sagra, Hist. Fís. Cuba, Bot. 11:10. 1850. Type: CUBA: Havana, s.d., *R. de La Sagra s.n.* (P not found).

Notes.—Achille Richard (1850:10) in the protologue of *Gardenia sagraeana* A. Rich., cited the material studied as "[Cuba] crescit in ruderatis circa Havanam, mense maio florens (Ramon de la Sagra), et prope Santiago de Cuba (Linden)," without citing the herbarium of deposit. A general search in Jstor Global Plants and in the P virtual herbarium no original specimen was found.

= *Randia spinifex* (Roem. & Schult.) Standl., Contr. U.S. Natl. Herb. 20(6):201. 1919.

SHAFEROCHARIS

Urban (1912:412) described the genus *Shaferocharis* Urb., dedicating the name to the American botanist John A. Shafer (1863–1918), who made numerous important collections in Cuba between 1903 and 1912. This genus has been included into the Chiococceae by several Rubiaceae specialists (e.g., Robbrecht 1988, 1994). Delprete (1996), according to his phylogenetic analyses using morphological characters, maintained it in the Chiococceae. It has never been included in any molecular phylogenetic study, mostly due to lack of recent collections. According to Borhidi (1972 ["1971"], 1982 ["1981"], 1983, 2017), this genus is composed of three species endemic to Cuba, which are here recognized.

Shaferocharis Urb., Symb. Antill. 7:412. 1912. Standley, N. Amer. Fl. 32(4):284–285. 1934; Liogier, Fl. Cuba 5:92–93. 1962; Borhidi & Muñiz, Acta Bot. Acad. Sci. Hung. 17:33–34, f. 15. 1972 ["1971"]; Borhidi, Acta Bot. Acad. Sc. Hung. 27(1–2):29–36. 1982 ["1981"]; Borhidi, Acta Bot. Hung. 29:181–215. 1983; Borhidi et al., Rubiáceas Cuba 404–409, f. 126–127. 2017. TYPE: *Shaferocharis cubensis* Urb.

1. Shaferocharis cubensis Urb , Symb. Antill. 7:413. 1912. TYPE: CUBA. HOLGUÍN: Sierra Moa ad austrum versus, in Campo La Gloria, 30 Dec 1910, *J.A. Shafer 8245* (**NEOTYPE, here designated:** A [00094520]; ISONEOTYPES: HAC [ex LS], NY [00115372], US [00138505 (frag. ex NY)]).

Distribution.—Cuba (Holguín: Sierra de Moa).

Notes.—Urban (1912:413), in the protologue of *Shaferocharis cubensis* Urb., cited the material studied as "in Cuba prov. Oriente in campo la Gloria prope Sierra Moa ad austrum versum, m. Dec. fruct.: Shafer n. 8245 (typus), ibidem: Shafer n. 8185" without citing the herbarium of deposit. The original material in B was destroyed during WWII. Four specimens of *Shafer 8245* are in A, HAC, NY, and US. None of them is annotated by Urban.

Borhidi (2017:404) cited the type of *S. cubensis* as "Tipo: Cuba; prov. Oriente in camp la Gloria prope Sierra de Moa […], J.A. Shafer 8245. Holotipo: NY! Isotipo: (LS)!" According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017:404) "holotype" citation cannot be treated as a valid lectotypification.

In A there is a specimen with barcode 00094520, which has a label with the typewritten annotations "Shaferocharis cubensis Urban, Camp La Gloria, south of Sierra Moa, Oriente, Symb. Antill. 7: 413. 1912. J.A. Shafer 8245 30 Dec. 1910." This specimen consists of several branches with numerous leaves and several axillary infructescences. Because this specimen is not annotated by Urban, it is here designated as the neotype of *S. cubensis*.

2. Shaferocharis multiflora Borhidi & Muñiz, Acta Bot. Acad. Sci. Hung. 17:33. 1972 ["1971"]. TYPE: CUBA. HOLGUÍN: Región de Moa, Río Yamanigüey, suelo de serpentina, 25 m, 24 Mar 1970, *A. Borhidi, O. Muñiz & S. Vázquez SV No. 27122* (HOLOTYPE: HAC [ex SV No. 27122)]; ISOTYPE: BP [No. 50311]).

Distribution.—Cuba (Holguín: Sierra de Moa).

3. Shaferocharis villosa Borhidi & Bisse, Acta Bot. Sci. Hung. 27:33. 1982 ["1981"]. TYPE: CUBA. GUANTÁNAMO-BARACOA: En charrascales húmedos del Río Maraví, Mar 1970, *J. Bisse & E. Köhler HFC No. 16189* (HOLOTYPE: HAJB [HAJB G 000860 (HFC No. 5808)]; ISOTYPES: JE [JE00004987 (*HFC No. 5808*)], SOF n.v.).

Distribution.—Cuba (Guantánamo: Baracoa, Rio Maraví).

SIEMENSIA

Urban (1923a:145) separated *Siemensia* Urb. from *Portlandia sensu lato* (as delimited in those days) based on the linear placenta, loculicidal capsules, large seeds with a cupuliform funiculum, and axillary inflorescences. He dedicated the genus name to Ernst Werner von Siemens (1816–1892), inventor and industrialist. Aiello (1979) maintained *Siemensia* as a distinct monospecific genus, and described its placentae and seeds as "placentae kidney-shaped in cross section. The tiny (1 mm or less) seeds, which are perpendicular to the placentae, cover it except to the side opposite the septum. After the seeds fall, a small hole is left in the placenta where each was attached" and further described the seeds as "broadly ovate to broadly elliptic, 0.9 mm long; testa with closely packed, deep pits, interspaces densely granulate." (Aiello, 1979:69, 77, figs. 65, 83, 84).

Motley et al. (2005) obtained contrasting results regarding the position and relationships of *Siemensia* in separate molecular analyses using *trnL-F* and ITS sequences. *Siemensia* was found as sister to a New Caledonian clade in the ITS analyses, or on a trichotomy with *Bikkia sensu stricto* clade (excluding the species endemic to New Caledonia, later transferred to *Thiollierea*) and a large *Scolosanthus-Erithalis-Chiococca* clade in the *trnL-F* analyses. Following these contrasting results, Motley et al. (2005) suggested that one or two dispersal events are required to account for the two western Pacific clades, one event is required to give rise to the New Caledonia clade (*Thiollierea*), and the other the *Badusa-Bikkia sensu stricto* clade.

Paudyal et al.'s (2018) molecular phylogenies were also ambiguous in establishing the phylogenetic position of *Siemensia*. In the analysis using nuclear and plastid data combined, *Siemensia* was resolved sister to the

Badusa–Bikkia clade, two genera occurring in the South Pacific. In the analyses using nuclear datasets, *Siemensia* was strongly supported as sister to the *Thiollierea–Morierina* clade, a group endemic to New Caledonia. In their phylogenies using plastid datasets, *Siemensia* was resolved in a trichotomy with the *Badusa–Bikkia* clade and *Chiococca–Scolosanthus* clade as sister clades.

Siemensia is a monotypic genus endemic to the limestone Haystack Mountains of the Province of Pinar del Río, western Cuba (Liogier 1962; Borhidi et al. 2017).

Siemensia Urb., Symb. Antill. 9:145. 1923; Liogier, Fl. Cuba 5:29. 1962; Aiello, J. Arnold Arbor. 60:119. 1979; Borhidi et al., Rubiáceas Cuba 409–410, f. 128. 2017; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018. TYPE: *Siemensia pendula* (C. Wright ex Griseb.) Urb.

1. Siemensia pendula (C. Wright ex Griseb.) Urb., Symb. Antill. 9: 145. 1923. *Portlandia pendula* C. Wright ex Griseb., Cat. Pl. Cub. 126. 1866. TYPE: CUBA. PINAR DEL RÍO: "Cuba Occ.," without locality, s.d., *C. Wright 2677* (HOLOTYPE: GOET [GOET010517]; ISOTYPES: AC [00320379], BM [000081666], F [No. 635156 (frag. ex G)], G [2 sheets, G00436770, G00436771], GH [00058977], NY [00126759], P [P02273498], S [2 sheets, No. S-R-7826, No. S07-14585], US [00137333], YU [YU.001824]).

Distribution.—Cuba (Pinar del Río, Artemisa).

Notes.—Grisebach (1866:126–127), in the protologue of *Portlandia pendula* C. Wright ex Griseb., cited the material studied as "Cuba occ. (Wr. 2677)" without citing the herbarium of deposit. According to Stafleu and Cowan (1976:1007), the GOET herbarium contains most of Grisebach's types. In GOET there is a single specimens annotated with this name. The specimen with barcode GOET010517, has a label with the annotation "Portlandia pendula" and a detailed description handwritten by Grisebach. This specimen is the holotype of this name.

SOLENANDRA

Joseph Dalton Hooker published the genus *Solenandra* in April 1873, in both Bentham & Hooker's *Genera Plantarum* and in *Hooker's Icones Plantarum*. He did not explain the etymology of the name. From the Greek, Solen- (σωλήν), tube, and -andros (ἀνδρος), male, anther, probably referring to the stamens with filaments basally connate, forming a basal tube. Stafleu and Cowan (1970:294–296), for the entry of *Hooker's Icones plantarum*, on page 294, supplied the date of publication for volume 12 as 1876, which is the date reported on the title page of the volume. However, on page 296, they cited different dates for the four parts of volume 12. They reported that page 43 and plate 1150 of *Solenandra ixoroides* Hook.f. are in the second part of volume 12, which was published in April 1873 (Hooker, 1873c). This publication date was determined from notes in the copies at BM and K. Article 31.1 of the *Code* (Turland et al. 2018) makes the exception that proof establishing the date of publication supersedes the date on the title page. As the publication of *Genera Plantarum* vol. 2, part 1, has the date of 7–9 April 1873 (Hooker, 1873a), it is here treated as the first publication date of *Solenandra*.

Solenandra was treated as a synonym of *Exostema* in the classic Rubiaceae classifications of Schumann (1891), Standley (1921:117), and Robbrecht (1988). McDowell (1996) maintained *Solenandra* as a synonym of *Exostema*, and included *Solenandra ixoroides* Hook.f. (as "*E. ixoroides* (Hook.f.) T. McDowell *ined*."), the type species of *Solenandra*, in *Exostema* section *Brachyantha* DC. *sensu* McDowell (1996). The new combination *E. ixoroides* (Hook.f.) T. McDowell ex Greuter was later published by Greuter (in Berazain et al. 2009:82), which is here treated as a synonym of *Solenandra parviflora* (Bonpl.) Delprete, comb. nov. (See below).

Rova (1999), in a molecular phylogenetic study of the Condamineae-Rondeletieae-Sipaneeae complex using *rps16* sequence data, retrieved *Exostema*, as circumscribed by McDowell (1996), as paraphyletic. Borhidi (2002), stimulated by the results of Rova (1999), resurrected *Solenandra* as a genus of 12 species endemic to Cuba, Hispaniola and Mexico, into which he transferred all the species of *Exostema* section *Brachyantha sensu* Borhidi & Fernández-Zequeira (1989) except *E. corymbosum* (which was transferred to *Motleyothamnus* by Paudyal et al (2018)). Borhidi (2002) differentiated *Exostema* from *Solenandra* by the branches with black lenticels (vs. white in *Solenandra*), flowers 4–21 cm long, blooming at night, fragrant (vs. 1–4 cm long, blooming during the day, not fragrant), with corollas pink or violet after anthesis (vs. pale yellow), corolla lobes linear (vs. ovate or lanceolate), style longer than stamens (vs. shorter than stamens), cylindrical capsules (vs. laterally compressed), containing 10–400 seeds (vs. 1–10 seeds).

Motley et al. (2005) as a result of a molecular phylogenetic analysis of the Catesbaeeae-Chiococceae complex, using ITS and *trnL-F* sequences, also retrieved *Exostema* and *Solenandra* as polyphyletic.

Paudyal et al. (2018), in their molecular phylogenetic study, retrieved *Solenandra* on a well-supported clade. The monophyly of *Solenandra sensu* Borhidi was already retrieved in some previous molecular studies (McDowell & Bremer 1998; McDowell et al. 2003; Manns & Bremer 2010; Manns et al. 2010). That clade, characterized by species with terminal inflorescences, was divided into two subclades. One subclade corresponds to *Solenandra sensu* Borhidi (2002), which has species with corollas 0.6–2.2(–3.0) cm long, turning pale yellow after anthesis, flowers fragrant during the day, and seeds basipetally arranged; while on the other subclade were found species with corollas 4–21 cm long, white, turning pink to maroon after anthesis, flowers fragrant at night, and seeds acropetally or centripetally arranged. Paudyal et al. (2018) treated all the species positioned on that clade, subdivided into two subclades, as part of a broadly delimited *Solenandra*.

Solenandra sensu Paudyal et al. (2018) is a genus ranging from Mexico and Central America, Cuba, Hipaniola, Jamaica, to Lesser Antilles, represented by subshrubs, shrubs or trees to 15 m tall, with terminal inflorescence, cymose or paniculate, flowers 5-merous, actinomorphic, stamens equal, exserted, style clavate or subcapitate, capsules subcylindrical, cylindrical or oblanceolate, round in cross-section, and seeds acropetally, basipetally or centripetally aligned, vertically imbricate. Several names are reduced under synonymy in the present treatment, and *Cinchona coriacea* is here transferred to *Solenandra*, resulting in a genus of 15 species.

Solenandra Hook.f., in Bentham G & Hooker JD, Gen. Pl. 2:12, 43. 7–9 Apr 1873. [Hooker's Icon. Pl. 12:45, pl. 1150. Apr 1873]. *Exostema* sect. *Solenandra* (Hook.f.) Greuter & R. Rankin, Taxon 71(1):213. 2022; Standley, N. Amer. Fl. 32(2):117–126. 1921; Liogier, Fl. Cuba 5:20–25, f. 2. 1962; Correll & Correll, Fl. Bahama Arch. 1394, f. 607. 1982; Borhidi & Fernández-Zequeira, Acta Bot. Hung. 35:287–307. 1989; Liogier, Fl. Española 7:254, 256–265, f. 198-15. 1995; McDowell. Monogr. *Exostema* (Rubiaceae), Ph.D. Thesis, Duke University, 1995; McDowell, Opera Bot. Belg. 7:277–295. 1996; McDowell et al., Pl. Syst. Evol. 212:215–246. 1998; Borhidi, Acta Bot. Hung. 44:223–231. 2002; Borhidi, Acta Bot. Hung. 45:13–21. 2003; McDowell et al., Syst. Bot. 28:431–441. 2003; Lorence, Fl. Mesoamericana 4.2:86–87. 2012; Borhidi et al., Rubiáceas Cuba 103–119, f. 27–28. 2017; Paudyal et al., Bot. J. Linn. Soc. 187(3):365–396. 2018; Borhidi et al., Acta Bot. Hung. 60(3–4):302–311. 2018; Greuter & Rankin-Rodríguez, Taxon 70:906. 2021; Greuter & Rankin-Rodríguez, Taxon 71:210–215. 2022; Delprete & Paudyal, Taxon 72(5):1098–1108. 2023. Type: *Solenandra ixoroides* Hook.f. [= *Solenandra parviflora* (Bonpl.) Delprete, **comb. nov.** (See below)]

1. Solenandra angustifolia (Sw.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:387. 2018. *Exostema angustifolium* (Sw.) Roem. & Schult., Syst. Veg. ed. 15[bis], 5:19. 1819. *Cinchona angustifolia* Sw., Kongl. Svenska Vetensk. Acad. Handl. 8:119. 1787. Type: HAITI: Quartier des Nippes, s.d., *O.P. Swartz s.n.* (lectotype (Paudyal et al. 2018: 387): S [No. 07-14973]; isolectotypes: BM [BM0000028154], LD [No. 1250897], S [No. 07-14956, No. 07-14958]; possible isolectotype: M [M-0187325]).

***Distribution.*—**Haiti (Massif de la Hotte).

2. Solenandra brachycarpa (Sw.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:388. 2018. *Exostema brachycarpum* (Sw.) Schult., in Roemer & Schultes, Syst. Veg., ed. 15[bis], 5:19. 1819. *Cinchona brachycarpa* Sw., Prodr. Veg. Ind. Occ. 42. 1788. Type: JAMAICA: without locality, s.d., *O.P. Swartz s.n.* (lectotype (Paudyal et al. 2018:387): S [No. S-07-14972]).

***Distribution.*—**Jamaica (central parishes).

3. Solenandra coriacea (Poir.) Delprete, **comb. nov.** *Cinchona coriacea* Poir. in Lamarck, Encycl. 6:38. 1804. *Exostema coriaceum* (Poir.) Schult., in Roemer & Schultes, Syst. Veg. ed. 15 [bis], 5:20. 1819. Type: HAITI ["St. Domingue"]: without locality, s.d., *J.B.R.P. Desportes s.n.* (**lectotype, here designated:** P-JU [P00680235]; isolectotype: P-LA [P00308387]).

***Distribution.*—**Haiti.

***Notes.*—**Poiret (1804:38), provided a detailed description of *Cinchona coriacea* Poir., and stated that it has terminal, paniculate inflorescences with dichotomous ramification, subsessile flowers, corollas two inches (ca. 5 cm) long, exserted stamens, and fruits one inch (2.5 cm) long, blackish, cylindrical. He cited the material studied as "Cette plante croit a l'ile de Saint-Domingue (*V.S. in herb.* Juss. & Lam.)" [This plant grows in the Island of Santo Domingo [Hispaniola] (dry specimens seen in the Jussieu and Lamarck herbaria)].

Schultes (in Roemer & Schultes 1819:20) published the new combination *Exostema coriaceum* (Poir.) Schult., citing the basionym *Cinchona coriacea* Poir., and reproduced Poiret's description. In the discussion, Schultes added "*Poiret* sine dubio hanc speciem jungit cum C. *nitida*, *Ruiz et Pav.*, licet non generis, et, monente se ipso, in *nitida* panicula amplior, tubus corollae duplo breviter, fructus oblongus, apice parum attenuatus. In

C. *coriacea Poiret* rami laeves striati, tecti cortice cinereo; folia opposita petiolata, obtusa, nervis lateralibus alternis prominentibus apice bifurcatis. Paniculae rami subdichotomi; pedunculi rigidi glabri floribus subsessilis glabris. Cal. oblongus margine dentibus 5 rectis acutis. Cor. 2 poll., tubo rectotereti, limbi laciniis angustis obtusis, longitudine tubi, glabris, reflexis. Antherae rectae, filiformes. Fructus cylindricus, nigrescens, pollicaris. *In S. Domingo. Herb. Juss. et Lam*." [Poiret undoubtedly associated this species with *C. nitida* Ruiz and Pav., although it is not of the same genus, as it has a larger panicle, corolla tube half the lobe length, fruit elongated, slightly tapered at tip. *Cinchona coriacea* has smooth, striated branches, with gray bark; leaves opposite, petiolate, obtuse, with secondary veins alternate, prominent, distally bifurcate. Panicles with subdichotomous ramification; peduncles rigid, glabrous, and flowers glabrous, subsessile. Calyx oblong, with 5 acute teeth. Corolla 2 inches [ca. 5 cm] long, tube straight, terete, with lobes narrow-linear, obtuse, as long as the tube, glabrous, reflexes. The anthers are straight, filiform. Fruits cylindrical, blackish, 1 inch [2.5 cm] long. *In Santo Domingo* [Hispaniola]. *Jussieu et Lamarck Herbaria*.]

In P-JU, there is a specimen, barcode P00680235, which has a label with the annotation "St. Domingue—herb. d. Desportes sans nom" handwritten by an unknown author. The annotation means that this specimen was collected by Jean-Baptiste-René Pouppé Desportes (1704–1748) in Haiti ("Saint Domingue"). On that label is glued a smaller label with the annotation "Cinchona coriacea Poir. Dict." handwritten by Poiret. On the sheet are affixed five branchlets, each of them with several leaves and a terminal inflorescence without flowers. On the bottom of the sheet is affixed an envelope containing numerous broken corollas, showing exserted stamens and styles. This specimen is here designated as the lectotype of *Cinchona coriacea*. https://mediaphoto.mnhn.fr/media/14418033301640yz3fs17wY8pIJeh

In P-LA there is a specimen, barcode P00308387, which has a label with the annotation "de St. Domingue ex D. Juss. Cinchona coriacea Dict." On the sheet are affixed two separate leaves, and a branchlet with several leaves, and a terminal inflorescence without flowers. On the sheet is affixed a small envelope containing a flower in anthesis, corolla lobes broken off and several portions of floral parts. The flower has exserted stamens with linear anthers, and exserted style. The material on this sheet was probably extracted from the specimen in P-JU, and is an isolectotype of *Cinchona coriacea*.

Andersson (1992:96) cited the type of *Cinchona coriacea* Poir. as "Type: Collector not cited; Hispaniola (P-Juss., P-Lam.)" and treated it as synonym of *Exostema coriaceum* (Poir.) Schult. Andersson (1998:63) maintained *C. coriacea* as a synonym of *E. coriaceum*, without citing the type.

Liogier (1995:259) recognized *Exostema coriaceum* as a distinct species. He provided a detailed description, and added "H: Herbario de *Jussieu y Larmark* (P); endémica. Una especie poco conocida, no coletada por botánicos modernos." (H [Haiti]: Herbaria of *Jussieu and Larmark* (P); endemic. A little-known species, not collected by modern botanists"). In the key to the species of *Exostema sensu lato* from Hispaniola, he distinguished *E. coriaceum* from *E. ellipticum* by the subsessile flowers (vs. with pedicels to 2 cm long in *E. ellipticum*), corolla lobes as long as corolla tube (vs. corolla lobes shorted than tube), and leaves with prominent venation (vs. not prominent). In the type specimens of *E. coriaceum* the flowers are pedicellate to short-pedicellate, while in *E. ellipticum* they are long-pedicellate. After examining the type specimens in P-JU and P-LA, and the descriptions provided by Poiret (1804:38), Schultes (in Roemer & Schultes, Syst. Veg. ed. 15 [bis], 5:20. 1819), and Liogier (1995:259), it became obvious that this species should be transferred to *Solenandra*. Paudyal et al. (2018), following their molecular phylogenies, characterized *Solenandra* by the terminal inflorescences, white corollas, basipetally septicidal capsules, among other characters, and divided it into two sections: Sect. *Solenandra*, with corollas 0.6–2.2(–3.0) cm long, turning pale yellow after anthesis, and Sect. *Pitonia* (DC.) Paudyal & Delprete, with corollas 4–21 cm long, turning pink to maroon after anthesis. Hence, this species belongs to Sect. *Pitonia*, and the new combination *Solenandra coriacea* (Poir.) Delprete is here provided.

4. Solenandra elliptica (Griseb.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:388. 2018. *Exostema ellipticum* Griseb., Pl. Wright. 2:504. 1862. Type: CUBA. Holguín: near villa Monte Verde, Jan.–Jul 1859, *C. Wright 1257* (lectotype (Paudyal et al. 2018: 388): GOET [GOET003383]; isolectotypes: A [00041000], BR [000000549057], G [G00436071, G00436072], GH [00046001], K [K000173632], MO [Nos. 2091694, 2091695], NY [00077371, 00077383], PH [00013986], S [No. S11-19749, S-R-8288], US [00130602], YU [YU.001735]).

Distribution.—Cuba (Pinar del Rio, Artemisa, Isla de la Joventud, Camagüey, Holguín, Santiago de Cuba), Haiti, Dominican Republic, and Puerto Rico.

Notes.—Grisebach (1862:503) in the protologue of *Exostema ellipticum* Griseb., cited the gathering *Wright 1257*, without citing the herbarium of deposit. According to Stafleu and Cowan (1979:1007) in GOET are kept most of Grisebach's types. Borhidi et al. (2017:108) cited the type of *E. ellipticum* as "Tipo: […] Jan–Jun 1859, *Wright 1257*; Holotipo: GOET; isotipos: GH, US." Borhidi et al. (2018:308) cited the type of *E. ellipticum* as "Tipo: […] Jan–Jun 1859, *Wright 1257*; Lectotipo: GOET; isolectotipos: BR, K, MO, NY, PH, S, US, YU."

According to the *Code* (Turland et al. 2018), starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017:108; 2018:308) lectotype designations are not valid.

In GOET there is a specimen of *Wright 1257*, with barcode GOET003383, which has a label with the annotation "Exostemma ellipticum m." handwritten by Grisebach. The specimen consists of numerous small branches with infructescences and dehisced capsules. This specimen was designated as the lectotype of *E. ellipticum* by Paudyal et al. (2018:388).

Exostema monticola Borhidi & M. Fernández, Acta Bot. Hung. 35:303. 1989. *Solenandra elliptica* ssp. *monticola* (Borhidi & M. Fernández) Borhidi & M. Fernández, Acta Bot. Hung. 60:309. 2018. TYPE: CUBA. GUANTÁNAMO: Sierra Maestra, Loma Pino del Agua, Alto de Valenzuela, 11 Aug 1955, *M. López Figueiras 2314* (**LECTOTYPE, here designated:** HAC [ex SV] (**Fig. 6**); ISOLECTOTYPES: HAC [ex LS], HAJB [HAJB G 000460], US [00589158]).

Notes.—Borhidi & Fernández Zequeira (1989:303) cited the type of *Exostema monticola* Borhidi & M. Fernández as "Holotypus: López Figueira L.F. 2314 HAC; Prov. Oriente; Sierra Maestra, Loma Pino del Agua, […], LOPEZ FIGUEIRAS, 11.08.1955. Isotypus: HAC, HAJB." Borhidi et al. (2017:108; 2018:309) cited the type of this name as "Tipo: Cuba, Prov. Oriente, Sierra Maestra, […] López Figueiras L.F. 2314. Holotipo: HAC; isotipos: HAC, HAJB." They did not specify which of the two specimen in HAC is the holotype, hence a lectotype needs to be designated for this name. In HAC are present two specimens of *López Figueiras 2314* that were originally preserved in two different herbaria. One specimen has a label with the heading "Republica de Cuba—ESTACION EXPERIMENTAL AGRONOMICA." The label heading means that this specimen was originally in SV, a herbarium that was later integrated in HAC. This specimen has another label with the annotation "HOLOTYPUS. Exostema monticola Borhidi et Fernández" handwritten by Borhidi. This specimen consists of two branches with numerous leaves, numerous flower buds, and several flowers in anthesis (**Fig. 6**), and is here designated as the lectotype of *E. monticola*.

The other specimen in HAC has label with the heading "HERBARIO DE LA SALLE." The heading means that this specimen was originally in LS, a herbarium that was later integrated in HAC. This specimen has another label with the annotation "ISOTYPUS. Exostema monticola Borhidi et Fernández" handwritten by Borhidi. This specimen consists of two branches with numerous leaves, numerous flower buds, and several flowers in anthesis, and is an isolectotype of *E. monticola*.

5. Solenandra lineata (Vahl) Paudyal & Delprete, Bot. J. Linn. Soc. 187:388. 2018. *Exostema lineatum* (Vahl) Schult., in Roemer & Schultes, Syst. Veg. ed. 15[bis], 5:18. 1819. *Cinchona lineata* Vahl., Skr. Naturhist.-Selsk. 1:22. 1790. TYPE: HISPANIOLA [HAITI]: without locality, s.d., *A. Thouin s.n.* (FIRST-STEP LECTOTYPE (Andersson 1992: 96); SECOND-STEP LECTOTYPE (Paudyal et al. 2018:389): C [No C10018139]).

Distribution.—Haiti and Dominical Republic.

Exostema subcordatum Krug & Urb., in Urban, Symb. Antill. 1:421. 1899. TYPE: HAITI: mountains near La Coupe, above Riviére, s.d., *B.P. Jaeger 210* (**LECTOTYPE, here designated:** C [C10018140]; ISOLECTOTYPES: BM [2 sheets, 000028115, 000028116], BR [000000530624], F [No. 189174], GH [00046015], GOET [GOET010236], JE [JE00004869], K [2 sheets, K000173619], M [M-0187319], US [00130610]).

Exostema subcordatum var. *buchii* Urb., Symb. Antill. 8:666. 1921. TYPE: HAITI: Plateau St. Roc, 24 Mar 1920, *W. Buch 1834* (**NEOTYPE, here designated:** US [00589160]).

Exostema picardae Krug & Urb. in Urban, Symb. Antill. 1:422. 1899. TYPE: HAITI: Plateau St. Roc, 24 Mar 1920, *W. Buch 1834* (**NEOTYPE, here designated:** US [00589160]).

Notes.—Krug and Urban (in Urban 1899:422), in the protologue of *Exostema picardae* Krug & Urb., cited the gathering *Picarda* 720, without citing the herbarium of deposit. The original material at B was destroyed, and no extant specimens of *Picarda 720* was found in the herbaria consulted. Hence a neotype needs to be designated. The specimen *Buch 1834* in US, with barcode 00589160, is here designated as the neotype of *E. picardae*.

Exostema rupicola Urb., Symb. Antill. 7:399. 1912 (as "*rupicolum*"). TYPE: DOMINICAN REPUBLIC. BARAHONA: near Baoruco, Jun 1911, *P. Fuertes 1169* (**NEOTYPE, here designated:** A [00046009]).

Notes.—Urban (1912:399), in the protologue of *Exostema rupicola* Urb., cited the gathering *Fuertes 1169*. The original material in B was destroyed during WWII. There is a specimens of *Fuertes 1169* in A, without any evidence that it was seen by Urban; hence it is here designated as the neotype of this name.

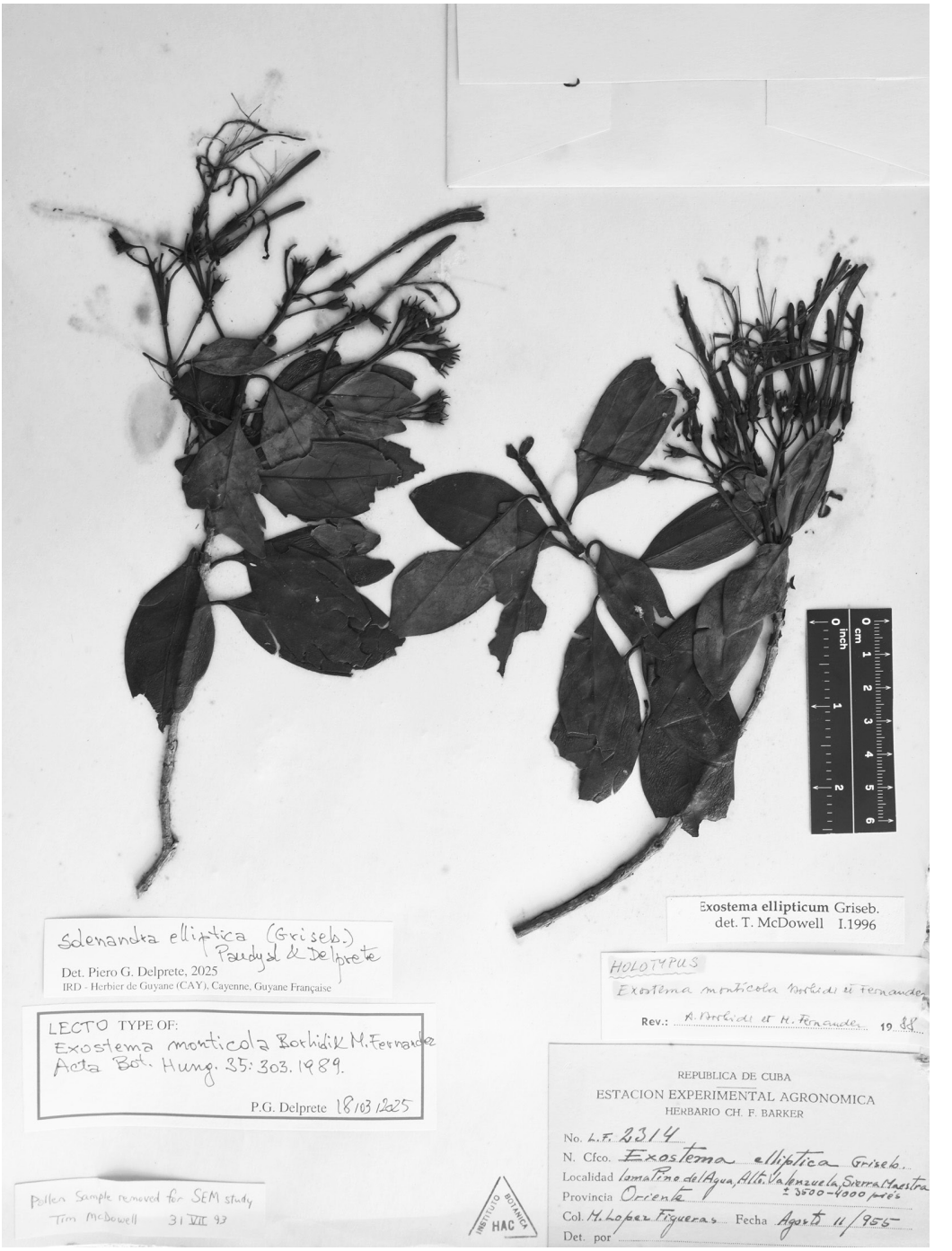

Fig. 6. Lectotype of *Exostema monticola* Borhidi & M. Fernández (*López Figueiras 2314*, HAC [ex SV]). = *Solenandra elliptica* (Griseb.) Paudyal & Delprete. Reproduced with permission by the Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana, Cuba.

6. Solenandra longiflora (Lamb.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:388. 2018. *Exostema longiflorum* (Lamb.) Schult., in Roemer & Schultes, Syst. Veg., ed. 15 [bis], 5:18. 1819. *Cinchona longiflora* Lamb., Descr. Cinchona 38, fig. 12. 1797. Type: HAITI: without locality, s.d. [1764–1765], *J.B.C. Aublet s.n.* (lectotype (Paudyal et al. 2018: 388): BM [BM000028085]).

***Distribution.*—**Cuba (the whole island), Haiti, and Dominican Republic.

Oxyanthus versicolor Lindl., in Edwards's Bot. Reg. 26:tab. 69. 1840. Type: Not found.

7. Solenandra mexicana (A. Gray) Borhidi, Acta Bot. Hung. 44:227. 2002. *Exostema mexicanum* A. Gray, Proc. Amer. Acad. 5:180. 1861. Type: MEXICO: Tantoyuca, Aug 1858, *L.C. Ervendberg 125* (holotype: GH [00046002]; isotypes: GOET [GOET010238], K [K000173631], P [P01900538]).

***Distribution.*—**Mexico, Belize, El Salvador, Honduras, Guatemala, and Costa Rica.

***Notes.*—**Gray (1861:180), in the protologue of *Exostema mexicanum* A. Gray, cited the gathering *Ervendberg 125*, without indicating the herbarium of deposit. According to Stafleu and Cowan (1976:983), Asa Gray's herbarium and types are at GH. In GH there is a specimen that has a label with the annotation "Exostema Mexicanum n. sp." handwritten by Gray, which is the holotype.

Exostema indutum Standl., N. Amer. Fl. 32(2):126. 1921. Type: MEXICO. Oaxaca: Villa Alta, Aug 184?_ [last digit missing], *H. Galeotti 2664* (holotype: US [00130603]; isotypes: BR [2 sheets, 000000530656, 000000530657], F [No. 775706], US [00589161]).

8. Solenandra myrtifolia (Griseb.) Borhidi, Acta Bot. Hung. 44:227. 2002. *Exostema myrtifolium* Griseb., Cat. Pl. Cub. 125. 1866. Type: CUBA. Guantánamo: Baracoa, 14 May 1861, *C. Wright 2673* (holotype: GOET [GOET010239]; isotypes: BM [000028151], G [G00436070], GH [000460003], HAC n.v., K [K000173629], MO [No. 2091701], YU [YU.001736]).

***Distribution.*—**Cuba (Holguín, Guantánamo).

Exostema shaferi Standl., N. Amer. Fl. 32(2):124. 1921. Type: CUBA. Guantánamo: Near El Yunque, Loma Santa Teresa, 2 Dec 1910, *J.A. Shafer 7746* (holotype: NY [00077356]; isotypes: A [00046014], BM [000028138], F [No. 493027], US [00589163]).

Exostema crassifolium Standl., N. Amer. Fl. 32:124. 1921. Type: CUBA. Guantánamo: Between Sabanilla and Yamuri Arriba, 30 Jan–1 Feb 1911, *J.A. Shafer 8416* (holotype: NY [00077382]; isotypes: A n.v., F n.v., US [00130599]).

Exostema nipense Urb., Symb. Antill. 9:521. 1928. Type: CUBA. Guantánamo: Sierra de Nipe, in charrascales, at Río Piloto, 30 Jul 1914, *E.L. Ekman 2303* (B†; **lectotype, here designated:** S [No. S07-14970]; isolectotypes: A [00061486], BM [000028094], MO [No. 1006605]).

Exostema dumosum Alain, Contr. Ocas. Mus. La Salle 17:3. 1959. Type: CUBA. Guantánamo: 32 km to the S of Baracoa, Via Azúl, charrascos, 14 Feb 1956, *Bro. Alain [A.H. Liogier] & C.V. Morton 5156* (holotype: HAC; isotypes: NY [2 sheets, 00380583, 00077355]).

Exostema barbatum Standl., N. Amer. Fl. 32:125. 1921. *Exostema myrtifolium* var. *barbatum* (Standl.) Borhidi & M. Fernández, Acta Bot. Hung. 35:298. 1989. *Solenandra myrtifolia* var. *barbata* (Standl.) Borhidi, Acta Bot. Hung. 44:230. 2002. Type: CUBA. Guantánamo: Baracoa, on pine hills, March 1903, *L.M. Underwood & F.S. Earle 1360* (holotype: NY [00077373]; isotype: US [00147046 (frag. ex NY)]).

9. Solenandra parviflora (Bonpl.) Delprete, **comb. nov.** *Exostema parviflorum* Bonpl., in Humboldt & Bonpland, Pl. Aequinoct. 1:132. [Apr.] 1807 (as "*parviflora*"). "*Solenandra parviflora* (L.C.M. Rich.) Borhidi," Acta Bot. Hung. 44:230. 2002, *comb. inval.* (Without bibliographic reference of the basionym). Type: ANTILLES [HAITI]: without locality, s.d., *L.C.M. Richard s.n.* (holotype: P [P03947017]; isotype: C n.v.).

***Distribution.*—**Cuba (Pinar del Río, Villa Clara, Cienfuegos, Sancti Spiritus, Las Tunas, Santiago de Cuba, Guantánamo), Haiti, Dominican Republic.

***Notes.*—**Bonpland (1807:132), for the genus *Exostema* stated "Ex accurata permultarum Rubiacearum analysi, jam dudum, etiam per Antillas itinerans, detexi ipse duorum generum discrepantiam et nomine diverso in schedis meis designavi. Spontaneas in supra dictis insulis septem novi species Exostemae; quarum una, ni fallor, adhuncum nova: [*Exostema parviflorum* Bonpl]." [From the accurate analysis of many Rubiaceae, travelling through the Antilles, I detected the discrepancy of two genera and I designated them with different names in my notes. Spontaneous in the seven aforementioned islands, a new species of *Exostema*; one of which, if I am not mistaken, is new: [*Exostema parviflorum* Bonpl]." On the same page, in the protologue of *Exostema parviflorum* Bonpl. (as "*parviflora*"), he cited "miror, quod neque in territorio Paraensi Brasiliae, neque in Guyanna Rubiaceis ditissima, speciem hujusce generi invenerim ullam." [I am surprised that neither in the territory of Pará, Brazil, nor in Guyana, where Rubiaceae are most abundant, I did not find any specimen of this genus].

In P, there are three specimens annotated as "Exostema parviflorum Rich." with barcodes P0394715, P03947016, and P03947018, collected by Ramón de la Sagra in Cuba. These specimens have labels with the heading "Herbarium Richard" handwritten in red ink, and they are not original material of *Exostema parviflorum*.

The P specimen with barcode P03947017, has a label with the annotations "Exostema parviflora Pl. Eq. t. 1. p.," "(Bonpland scripsit)," and "Antilles. Rich. D.D." The latter annotations means that the specimen was collected in the Antilles by L.C.M. Richard, most likely in Haiti ["St. Domingue"]. On the sheet are affixed two small branches, one with a few leaves and a terminal inflorescence with numerous flower buds, and the other without leaves and a terminal inflorescence with several flowers in anthesis. This specimen is the holotype of *Exostema parviflorum*.

The P specimen with barcode P03947019, has a label affixed on the bottom left corner, with the annotation "St. Domingue." Just above that label, there is another label with the annotation "Echantillon appartenent à l'Herbier gènérale. Classé parmi les Hamelia ausquels il ne parait pas appartenir" handwritten by an unknown author. A third label bears Liogier's identification "Exostema elegans Krug & Urb." [= *Solenandra parviflora* (Bonpl.) Delprete]. This specimen is not original material.

Borhidi (2002:230) published the new combination "*Solenandra parviflora*" but he incorrectly cited the author of the basionym as "*Exostema parviflorum* L.C.M. Rich.," and did not cite the bibliographic reference of the basionym, and without citing the type. According to Art. 41.5 of the *Code* (Turland et al. 2018), "On or after 1 January 1953, a new combination, name at new rank, or replacement name is not validly published unless its basionym or replaced synonym is clearly indicated and a full and direct reference given to its author and place of valid publication, with page or plate reference and date (but see Art. 41.6 and 41.8)." Hence, Borhidi's new combination is not valid, and the new combination *Solenandra parviflora* (Bonpl.) Delprete is here published.

Exostema valenzuelae A. Rich., in Sagra Hist. Nat. Cuba 11:6, pl. 48. 1850, *nom. nud. illeg. pro syn.* of *Exostema parviflorum* Bonpl.

Notes.—Achille Richard (1850:6) under "Exostema parviflorum L.C. Rich." cited "Tab. 48. sub falso et delendo nomine Exost. Valenzuelae. Nob.," and in the *Observaciones* he stated "Esta especie ha sido representada en la lamina 48 de esta obra, bajo el nombre *de Exostemma Valenzuelae*: nombre que debe ser rempazado por el *E. parviflorum* que realmente le pertenece. Hemos comparado las muestras de Cuba con las que nuestro padre habia recogido en las Antillas, y conocímos la identidad de todas ellas." [This species is depicted in plate 48 of this work, under the name *Exostemma valenzuelae*: a name that should be replaced by *E. parviflorum*, which really belongs to it. We compared the specimens from Cuba with those collected by my father in the Antilles, and we know the identity of all of them].

Solenandra ixoroides Hook.f., Hooker's Icon. Pl. 12:45, tab. 1150. Apr 1873. *Steudelago ixoroides* (Hook. f.) Kuntze, Rev. Gen. Pl. 1:298. 1891. *Exostema ixoroides* (Hook.f.) McDowell ex Greuter, Bissea 3 (num. esp.):82. 2009. TYPE: CUBA: without locality, s.d., *R. de La Sagra 329* (HOLOTYPE: K [K000173630]).

Distribution.—Cuba (Las Villas, Santa Clara, Pinar del Río).

Notes.—Joseph Dalton Hooker published *Solenandra ixoroides* Hook.f. in *Hooker's Icones Plantarum* 12:45, pl. 1150, on April 1873. Stafleu and Cowan (1970:294–296), for the entry of *Hooker's Icones plantarum*, on page 294, supplied the date of publication for volume 12 as 1876, which is the date reported on the title page of the volume. However, on page 296, they reported that page 43 and plate 1150 of *S. ixoroides* are in the second part of volume 12, which was published in April 1873 (Hooker, 1873c). This publication date was determined from notes in the copies at BM and K. Article 31.1 of the *Code* (Turland et al. 2018) makes the exception that proof establishing the date of publication supersedes the date on the title page.

Borhidi et al. (2018:309) cited the type of *Solenandra ixoroides* Hook. f., as "dibujo de W.H. Fitch in Hooker J.D., Icones Plantarum 1876." However, as explained above, the plate was published in April 1873. Plate 1150 is original material of *S. ixoroides*. On the plate is depicted a branch with numerous ovate leaves, with a terminal inflorescence bearing numerous flower buds and a few flowers in anthesis. On the plate are also depicted the details of ovary and capitate style, a flower in anthesis with exserted stamens, stamens basally connected forming a basal tube, and a fruit longitudinally dissected. According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2018) inadvertent lectotype designation is not valid.

In K there is a specimen with barcode K000173630, which has a label with the annotations "329. Cuba. De La Sagra. Com. Franqueville. V/65. Ovarium biloculare." On the sheet are drawn, in pencil, the details of an ovary and capitate style, a flower in anthesis with exserted stamens, stamens basally connected forming a basal tube, and a fruit longitudinally dissected, all quite similar to those illustrated on plate 1150 of *Hooker's Icones plantarum*. The sheet also carries the stamp "Herbarium Hookerianum 1867." On the sheet is affixed a ramified branch with numerous ovate leaves, and several inflorescences with flower buds and flowers in anthesis. The specimen citation in Hooker's protologue of *Solenandra ixoroides*, "HAB. Island of Cuba, *Don Ramon de la Sagra*

(communicated by *M. Franqueville*)," is sufficient to identify the K specimen with barcode K000173630 as the one he cited, and is the holotype.

Exostema elegans Krug & Urb., in Urban, Symb. Antill. 1(3):423. 1899. Type: HAITI: Prope Port-au-Prince, flanc du Morne de l'Hôpital, 12 Nov. 1892, *L. Picarda 1055* (**lectotype, here designated:** F [No. 189178]).

Notes.—Krug and Urban (in Urban 1899:423), in the protologue of *Exostema elegans* Krug & Urb., cited two gatherings from Haiti, *Picarda 593* and *Picarda 1055*, without citing the herbarium of deposit. The original material at B studied by them was destroyed during WWII. Borhidi and Fernández Zequeira (1989:305–306) cited the type of *E. elegans sensu* Alain as "Exostema elegans Alain Fl. Cuba 5. 25. 1962, p.p. non Kr. et Urb. Holotypus: Acuña 10218 LS (HAC); Prov. Oriente; bordes del Rio Portillo, Sierra Maestra, Pico Turquino, 26.10.1936. Isotypus: Herb. ROIG 7742 (HAC)" [underline by the authors]. Their citation of the type of *E. elegans sensu* Alain is completely different than that of the gatherings cited by Krug and Urban (in Urban 1899:423) for *E. elegans* Krug & Urb.

A specimen in F, accession No. 189178, has a label with the heading "Ex Herbarium Krug et Urban" and the annotations "1055. Exostema elegans Kr. et Urb. det. Urb. 1897. Haiti. 26.V.1893. 12.Nov.1892. Leg. Picarda" handwritten by Urban. On the sheet are affixed a sterile branch and a branch with a terminal infructescence with dehisced capsules. This specimen is here designated as the lectotype of this name.

Exostema wrightii Krug & Urb., in Urban, Symb. Antill. 1:424. 1899. *Exostema parviflorum* ssp. *wrightii* (Krug & Urb.) Borhidi, Bot. Közl. 71:157. 1973. *Exostema valenzuelae* ssp. *wrightii* (Krug & Urb.) Borhidi, Acta Bot. Hung. 35:306. 1989. *Solenandra ixoroides* ssp. *wrightii* (Krug. & Urb.) Borhidi, Acta Bot. Hung. 44:227. 2002. *Exostema ixoroides* ssp. *wrightii* (Krug & Urb.) Greuter, Bissea 3 (num. esp.):82. 2009. Type: CUBA. Holguín: Monte Verde, 1860–1864, *C. Wright 2672* (holotype: GOET [GOET010235]; isotypes: GH [00046016], MO [No. 2091687], S n.v., YU [YU.065587]).

Exostema velutinum Standl., N. Amer. Fl. 32(2):125. 1921. *Solenandra velutina* (Standl.) Borhidi, Acta Bot. Hung. 44:230. 2002. Type: CUBA. Santa Clara: Río San Juan, 24–25 March 1910, *N.L. Britton, F.S. Earle & P. Wilson 5837* (holotype: NY [00077357]; isotypes: F [No. 492608], US [00131313]).

Exostema eggersii Urb., Symb. Antill. 9:521. 1928. *Exostema parviflorum* ssp. *eggersii* (Urb.) Borhidi, Bot. Közl. 71:157. 1973. *Exostema valenzuelae* ssp. *eggersii* (Urb.) Borhidi, in Borhidi & Fernández, Acta Bot. Hung. 35:306. 1989. *Solenandra ixoroides* ssp. *eggersii* (Urb.) Borhidi, Acta Bot. Hung. 44:227. 2002. *Exostema ixoroides* ssp. *eggersii* (Urb.) Greuter, Bissea 3 (num. esp.):82. 2009. Type: CUBA. Guantanamo: El Palenquito, March 1889, *H.F.A. Eggers 4809* (**neotype, here designated:** US [00130601]; isoneotype: P [P03947012]).

Notes.—Urban (1928:521), in the protologue of *Exostema eggersii* Urb., cited *Eggers 4809* as the sole gathering for this name. The original material at B was destroyed during WWII. Borhidi et al. (2018:309) cited the type of *E. eggersii* as "Tipo: Prov. Oriente, […], Eggers (4809). Holotipo: B†; lectotipo: Cuba, Prov. Oriente, Mesa de Prada, […] León (11958), 17 Jul–4 Aug 1924, HAC (LS); isolectotipos: NY, US." According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2018) lectotype designation is not valid. In US there is a specimen of *Eggers 4809*, which does not have any evidence that it was studied by Urban; hence, this specimen is here designated as the neotype of this name.

Exostema valenzuelae ssp. *maestrense* Borhidi & M. Fernández, Acta Bot. Hung. 35:305. 1989. *Solenandra ixoroides* ssp. *maestrensis* (Borhidi & M. Fernández) Borhidi, Acta Bot. Hung. 44:227. 2002. *Exostema ixoroides* ssp. *maestrensis* (Borhidi & M. Fernández) Greuter, Bissea 3 (num. esp.):82. 2009. Type: CUBA. Guantanamo: Sierra Maestra, Pico Turquino, banks of Río Portillo, 10–26 Jun 1936, *J.B. Acuña Galé 10228* (holotype: HAC; isotypes: F [No. 867726], S [No. S07-15120], US [00589156]).

Exostema valenzuelae ssp. *parvifolium* Borhidi & M. Fernández, Acta Bot. Hung. 35:306. 1989. *Solenandra ixoroides* ssp. *parvifolia* (Borhidi & M. Fernández) Borhidi, Acta Bot. Hung. 44:227. 2002 (as "*parvifolium*"). *Exostema ixoroides* ssp. *parvifolia* (Borhidi & M. Fernández) Greuter, Bissea 3 (num. esp.):82. 2009. Type: CUBA. Guantánamo: Palenque, Cuchillas de Toa, Cayo Fortuna, en el trillo de Riito a Piloto Arriba, Apr 1972, *J. Bisse & R. Berazain 22258* (holotype: HAC; isotype: JE [JE00001229]).

Exostema curbeloi Borhidi & M. Fernández, Acta Bot. Hung. 35:304. 1989. *Solenandra curbeloi* (Borhidi & M. Fernández) Borhidi, Acta Bot. Hung. 44:227. 2002. Type: CUBA. Las Tunas: Puerto Padre, banks of streams, 8 Dec 1931, *M. Curbelo X 105* (**lectotype, here designated:** HAC [Roig Herbarium - Plantas de Cuba No. 5857] (**Fig. 7**); isolectotypes: HAC [ex LS No. 15840], NY [00077384, upper portion of sheet]).

Notes.—Borhidi and Fernández (1989:304), in the protologue of *Exostema curbeloi* Borhidi & M. Fernández, cited the type as "Oriente: Puerto Padre, banks of streams, *Herb. Roig* (= *Curbelo 105*) (holotype HAC; isotype, HAC)" Borhidi et al. (2017:107) cited the type of *Exostema curbeloi* as "Tipo: Cuba. Prov. Oriente, Puerto Padre, orillas y arroyos, 8 Dec. 1931, Curbelo 105. Holotipo: Herb. Roig 5857 HAC. Isotipo: HAC." Because Borhidi and Fernández (1989:304) and Borhidi et al. (2017:107) did not specify which of the two specimens in HAC is the holotype, a lectotype needs to be designated.

In HAC there are two original specimens that were originally in two different herbaria. One specimen has a label with the heading "PLANTAS DE CUBA—HERBARIO DE JUAN T ROIG" and the handwritten annotations "No. 5857 […] Puerto Padre, Diciembre 8 de 1931 […] M. Curbelo X 105." On the sheet is affixed another label with the annotation "HOLOTYPUS. Exostema curbeloi Borhidi et Fernández" handwritten by Borhidi in 1988. This specimen (**Fig. 7**) consists of seven branchlets with numerous leaves. Several branchlets have terminal infructescences with immature fruits. One branchlet has terminal infructescences

Fig. 7. Lectotype of *Exostema curbeloi* Borhidi & M. Fernández (*Curbelo X 105*, HAC [Roig Herbarium - Plantas de Cuba No. 5857]). = *Solenandra parviflora* (Bonpl.) Delprete. Reproduced with permission by the Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana, Cuba.

with dehisced capsules, and the other branchlet, without leaves, has an inflorescence with flower buds. This specimen is here designated as the lectotype of *Exostema curbeloi*.

The other specimen in HAC has a label with the heading "HERBARIO DEL COLEGIO DE LA SALLE" and the annotations "Núm. 15840 […] Pto. Padre (Oriente), M. Curbelo X 105, Fecha Dic. 8. 1931." The label heading means that this specimen was originally part of the LS herbarium, which was later integrated in HAC. On the sheet is affixed another label with the annotation "Exostema curbeloi Borhidi et Fernández" handwritten by Borhidi in 1988. This specimen consists of four branchlets with numerous leaves and terminal infructescences with immature fruits, and is an isolectotype of *Exostema curbeloi*.

Exostema microcarpum Borhidi & M. Fernández, Acta Bot. Hung. 35:304. 1989. *Solenandra microcarpa* (Borhidi & M. Fernández) Borhidi, Acta Bot. Hung. 44:227. 2002. Type: CUBA. Santiago de Cuba: Cercanías de la desembocadura del Río San Juan, Playa de Aguadores, 26 Oct 1952, *M. López-Figueiras 718* (LECTOTYPE, **here designated:** HAC [ex SV]; isolectotypes: HAC [ex LS], NY [00077354], US [00589157]).

Notes.—Borhidi and Fernández Zequeira (1989:304), in the protologue of *Exostema microcarpum* Borhidi & M. Fernández, cited the type as "Holotypus: L. F. 718. HAC; Cuba; prov. Oriente; Santiago de Cuba, cerca de la desembocadura del Río San Juan, Playa de Aguadores. Leg.: M. LOPEZ FIGUEIRAS 26. 10. 1952. Isotypus: HAC, HAJB, NY." Borhidi et al. (2017:111; 2018:310) cited the type of *E. microcarpum* as "Tipo: L.F. 718. Cuba; prov. Oriente; Santiago de Cuba, […], 26. Oct 1952. Holotipo: HAC. Isotipos: HAC, HAJB, NY." Because Borhidi and Fernández Zequeira (1989:304), and Borhidi et al. (2017:111; 2018:310) did not cite which of the two specimens in HAC is the holotype, a lectotype needs to be designated for this name.

In HAC there are two specimens of *Lopez-Figueiras 718* that originated from two different herbaria. One specimen has a label with the heading "REPUBLICA DE CUBA—ESTACION EXPERIMENTAL AGRONOMICA" and the handwritten annotations "L.F. 718 […] M.Lopez Figueiras, Octubre 26/952." The label heading means that this specimen was originally in SV, which is now integrated in HAC. On the sheet is also affixed a label with the annotation "HOLOTYPUS: Exostema microcarpum Borhidi et Fernández" handwritten by Borhidi in 1988. The specimen consists of a ramified branch, with numerous leaves, and numerous inflorescences; some them with flowers in anthesis, and some others with flower buds. This specimen is here designated as the lectotype of *Exostema microcarpum*.

The other specimen of *López-Figueiras 718* in HAC has a label with the heading "HERBARIO DE LA SALLE" and the typewritten annotations "718. Fecha: Oct 26, 1952. Col.: M. López Figueiras." The label heading means that this specimen was originally in LS, which is now integrated in HAC. On the sheet is also affixed a label with the annotation "ISOTYPUS: Exostema microcarpum Borhidi et Fernández" handwritten by Borhidi in 1988. The specimen consists of a ramified branch, with numerous leaves, and numerous inflorescences; some of them with flowers in anthesis, and some others with flower buds. This specimen is an isolectotype of *Exostema microcarpum*.

Exostema pervestitum Borhidi & M. Fernández, Acta Bot. Hung. 35:307. 1989. *Solenandra pervestita* (Borhidi & M. Fernández) Borhidi, Acta Bot. Hung. 44:230. 2002. TYPE: CUBA. GUANTÁNAMO: Baracoa, Maisí, vertientes, Apr 1939, *Bro. León 18964* (HOLOTYPE: HAC [ex LS]; ISOTYPES: GH [00061491], MO [No. 2285941], NY [00077360], US [00811016]).

Exostema myrtoides Alain, Phytologia 70:151. 1991. TYPE: DOMINICAN REPUBLIC. BARAHONA: Polo—Los Arroyos, 28 Feb 1969, *Bro. A. Liogier 14342* (HOLOTYPE: NY [00077381]; ISOTYPE: GH [00061488]).

Exostema pulverulentum Borhidi, Acta Bot. Hung. 37:79. 1992. *Solenandra pulverulenta* (Borhidi) Borhidi, Acta Bot. Hung. 44:230. 2002. TYPE: CUBA. SANTA CLARA: Trinidad Mountains, San Joss, on low cliffs, 29 Jul 1936, *L.B. Smith, A.R. Hodgdon & F. González 3268* (HOLOTYPE: NY n.v. [probably lost]; ISOTYPES: F [No. 858347], GH n.v., JPU n.v., S [No. S07-15068], US [00589155]).

10. Solenandra polyphylla (Urb. & Ekm.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:388. 2018. *Exostema polyphyllum* Urb. & Ekman, Ark. Bot. 22A(10):86. 1919. HAITI: Massif de la Hotte, central group, St-Louis du Sud, 1 Nov 1937, *E.L. Ekman 9212a* (LECTOTYPE (Paudyal et al. 2018:388): S [No. 07-14969]; ISOLECTOTYPES: S [No. 05-557, No. 07-14959], US [No. 1413356, barcode 00589159]).

Distribution.—Haiti (Massif de la Hotte).

11. Solenandra rotundata (Griseb.) Paudyal & Delprete, Bot. J. Linn. Soc. 187:388. 2018. *Exostema rotundatum* Griseb., Pl. Wright. 2:504. 1862. *Exostema ellipticum* var. *rotundatum* (Griseb.) Maza, Anales Soc. Esp. Hist. Nat. 23:286. 1894. TYPE: CUBA. HOLGUÍN: Monte Verde, "prope villam Monte Verde," Jan–Jul 1859, *C. Wright 1258* (FIRST-STEP LECTOTYPE (Borhidi & M. Fernández 1989: 295); SECOND-STEP LECTOTYPE (Paudyal et al. 2018: 388): GOET [GOET003385]; ISOLECTOTYPES: BR [00000530580], K [K000173633], MO [No. 2091691], PH [00013987], YU [YU001738]).

Distribution.—Cuba (Holguín: Moa, Monte Verde).

Notes.—Grisebach (1862:504), in the protologue of *Exostema rotundatum* Griseb., cited the two gatherings *Wright 1258* and *Wright 1259*. Borhidi and Fernández-Zequeira (1989:295) cited the type of this taxon as "Tipo: Wr. [Wright] 1258, Monteverde," which is a first-step lectotypification, because they did not cite the herbarium of deposit. Borhidi et al. (2017:115) cited the type of *E. rotundatum* as "Tipo: Cuba Oriental, Monteverde, C. Wright 1258. Holotipo: GOET, isotipos: GH, HAC." Borhidi et al. (2018:311) cited the type of this name as "Tipo: Cuba, Oriente: Guantánamo Prov. [sic! Holguín Prov.], […], C. Wright (1258), Jan–Jul

1859 (fl, fr). Lectotipo: GOET; isolectotipos: BR, HAC, K, MO, PH, MO, PH, YU." According to the *Code*, starting from 1 January 2001, the designation of a lectotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al.'s (2017:115) "holotype" citation, and Borhidi et al.'s (2018:311) "lectotype" citation cannot be treated as valid lectotypifications. Paudyal et al. (2018:388) designated the GOET specimen with barcode GOET 003385 as the second-step lectotype for this name.

Exostema obovatum Alain, Contr. Ocas. Hist. Nat. Colegio De la Salle 17:2. 1959. Type: CUBA. Holguín: Moa, Mina Cayoguan, 2 Jul 1945, *Bro. Clemente 4483* (holotype: HAC [ex LS]; isotypes: GH [00046004], NY [00077380], US [00130604]).

12. Solenandra sanctae-luciae (Kentish) Paudyal & Delprete, Bot. J. Linn. Soc. 187:389. 2018. *Exostema sanctae-luciae* (Kentish) Britten, J. Bot. 53:138. 1915. *Cinchona sanctae-luciae* Kentish, Exp. Obs. New Sp. Bark 51. 1784. *Cinchona caribaea santae luciae* Davidson in Morgan, Trans. Amer. Phil. Soc. 2:292. 1786. *Cinchona santae-luciae* Davids. ex Roem. & Schult., Syst. Veg. 5:19. 1819, *nom. illeg. superfl.* Type: ST. VINCENT: Leeward side of the island, s.d., *A. Anderson s.n.* (lectotype (McDowell 1996: 293): BM [BM000028083]).

Distribution.—Lesser Antilles (St. Vincent, St. Lucia, Guadeloupe, Dominica, Martinique).

Cinchona floribunda Sw., Prodr. 41. 1788. *Exostema floribundum* (Sw.) Schult., in Roemer & Schultes (as "*Exostemma*"), Syst. Veg. 5:19. 1819. Type: ANTILLES [St. Lucie, Martinique, Hispaniola], s.d. [1784–1786], *O. Swartz s.n.* (**lectotype, here designated:** M [M-0187320]).

Notes.—Swartz (1788:41), in the protologue of *Cinchona floribunda* Sw., cited the localities "St. Lucia, Martinica, Hipaniola." According to Stafleu and Cowan (1986:117) "The Swartz herbarium constitutes, with the Alströlmer herbarium, the basis of […] S. […] The West-Indian collections (1784–1786) at S, however, are not complete." Stafleu and Cowan (1986:117) added "Swartz was very liberal with his specimens and Swartz types will be found for instance in BM and LD." Hence, Swartz's specimens are present in many herbaria.

There is a specimen in M, barcode M-0187320, which has a label with the annotations "Cinchona floribunda Sw., Prodr. p. 41, Fl. Ind. Occ. I p. 375. Exostema floribunda R. & Sch., Syst. Veg. V p. 19. India occident. Ol. Swartz. Herbarium Schreber." The specimen consists of a mall branch with several leaf pairs and a terminal inflorescence with flower buds. This specimen is here designated as the lectotype of *Cinchona floribunda*.

Cinchona luciana Vitman, Summa Pl., Suppl. 1:264. 1802. Type: Not found.

13. Solenandra selleana (Urb. & Ekm.) Borhidi, Acta Bot. Hung. 44:230. 2002. *Exostema selleanum* Urb. & Ekm., Ark. Bot. 22A(10):85. 1929. Type: HAITI: Massif de la Selle, Ganthier, gorge of Rivière Blanche, 12 Dec 1926, *E.L. Ekman H-7358* (**lectotype, here designated:** S [No S07-14966]; isolectotypes: A [00046012], G [G00436064], GH [00046011], K [000173628], NY [00077398], S [Nos. S05-561, S05-563, S07-14965], U [U0044609], US [00130607, 00589162]).

Distribution.—Haiti (Massif de la Selle, Montagnes Noires) and Cuba (Guantánamo: San Antonio del Sur, Abra de Mariana; Santiago de Cuba).

Notes.—Urban and Ekman (in Urban, 1929:85) in the protologue of *Exostema selleanum* Urb. & Ekm., cited the material studied as "Haiti, Plaine Cul-de-Sac prope Ganthier in faucibus ad Riv. Blanche 250 m, alt., m. Dec. flor. et fruct.: [Ekman] n. H 7358.," without citing the herbarium of deposit. The original material at B that they studied was destroyed during WWII. In S there is specimen, accession number S07-14966, that has a label with the heading "Mus. Botan. Stockholm" and the collection data handwritten by Ekman. On the sheet are mounted several branches with infructescences and inflorescences with flowers in anthesis. Because Ekman is the collector and the author of the name, this specimen is here designated as the lectotype of *E. selleanum*.

Exostema scabrum Borhidi & M. Fernández, Acta Bot. Hung. 35:304. 1989. Type: CUBA. Guantánamo: San Antonio del Sur, Abra de Mariana, Monte seco, 21 May 1982, *J. Bisse, M. Bässen, M. Díaz, H. Dietrich, L. Glez & K. Günther 48177* (holotype: HAJB [HAJB G 000464]).

Exostema cordatum Borhidi & M. Fernández, Acta Bot. Hung. 35:303. 1989. *Solenandra cordata* (Borhidi & M. Fernández) Borhidi, Acta Bot. Hung. 44:227. 2002. Type: CUBA. Santiago de Cuba: Sardinero, Dec 1948, *Hermelia Casas LS No. 6331a* (holotype: HAC [ex LS]; isotypes: loc. cit., Dec 1948, *Bro. Clemente LS No. 6331b* (GH [00061492, 00061493], HAC [ex LS], US [00589153, 00589154]).

Notes.—Borhidi and Fernández Zequeira (1989:303–304) cited the type of *Exostema cordatum* Borhidi & M. Fernández as "Holotypus: 6331[a] Sra HERMELIA CASAS (HAC); Cuba, prov. Oriente, Sardinero, en paredón. Dec. 1948.—Isotypus: 6331[b] Hno CLEMENTE (HAC)" [underline by the authors]. The gatherings *Hermelia Casas LS No. 6331a* and *Bro. Clemente LS No. 6331b* where made on December 1948 from the same plants.

14. Solenandra stenophylla (Britton) Paudyal & Delprete, Bot. J. Linn. Soc. 187:389. 2018. *Exostema stenophyllum* Britton, Bull. Torrey Bot. Club 42:517. 1915. Type: CUBA. Oriente: Río Guayabo, 21 Jan 1920, *J.A. Shafer 3623* (holotype: NY [00077358]; isotypes: F [No 450871, MO [No. 805456, barcode 716665], US [No. 792667, barcode 00130609]).

Distribution.—Cuba (Holguín: Sierra de Nipe, Sierra de Moa).

15. Solenandra triflora (W. Wright) Paudyal & Delprete, Bot. J. Linn. Soc. 187:389. 2018. *Exostema triflorum* (W. Wright) G. Don, Gen. Hist. 3:481. 1834. *Cinchona triflora* W. Wright, London Med. J. 8:240. 1787. Type: JAMAICA: Manchioneel Parish, s.d., *T. Dancer & O.P. Swartz s.n.* (first-step lectotype (Andersson 1992: 97), second-step lectotype (Paudyal et al. 2018: 389): BM [BM000028092]).

Distribution.—Jamaica (St. Ann's and Manchioneel Parishes).

THOGSENNIA

Aiello (1979) transferred *Gonianthes lindeniana* to the monospecific genus *Thogsennia*, because the name *Gonianthes* was previously used by Blume (1823) for a genus of Burmanniaceae. The name *Thogsennia*, as explained by Aiello, is an anagram of *Gonianthes*. Robbrecht and Bridson (1994 ["1993"]) discussed the nomenclatural problems of *Gonianthes*, *Thogsennia*, and *Cubanola*. Aiello (1979:117) stated that *Thogsennia* is similar to *Portlandia* in having large flowers and horizontal seeds, and that the former differs from the latter by having thinner leaves, placenta forking in cross-section (vs. placenta linear and adnate for the whole length to the midline of the septum), indehiscent fruits (vs. loculicidal capsules), and seed testa collapsed-colliculate to reticulate, with cells elongated and wrinkled (vs. testa tuberculate with the tuberculae collapsed, funicle persistent and with cup-shaped swelling at apex). *Thogsennia* is a monotypic genus occurring in Cuba and Dominican Republic.

Thogsennia Aiello, J. Arnold Arbor. 60:116. 1979; Standley, N. Amer. Fl. 32(1):11–12. 1918 (as *Portlandia lindeniana*); Liogier, Fl. Cuba 5:27. 1962 (as *Portlandia lindeniana*); Liogier, Fl. Española 7:438–439. 1995; Aiello, J. Arnold Arbor. 60:116–118. 1979; Borhidi et al , Rubiáceas Cuba 445. 2017. Type: *Thogsennia lindeniana* (A. Rich.) Aiello

1. Thogsennia lindeniana (A. Rich.) Aiello, J. Arnold Arbor. 60:117. 1979. *Gonianthes lindeniana* A. Rich., in R. de la Sagra, Hist. Fis. Cuba, Bot. 11:10, tab. 49bis. 1850. Type: CUBA. Santiago de Cuba: ["San Yago"], forêt entre Jagua et Tanamo, May 1844, *J. Linden 1799* (holotype: P [P02273499]; isotypes: F [No. 635306 (frag. ex G)], G [G00436806], P [P00582089], MPU [MPU021510]).

Distribution.—Cuba (Santiago de Cuba, Guantánamo, Holguín), Dominican Republic (Santo Domingo, Santiago).

Notes.—Achille Richard (in Sagra 1850:10), in the protologue of *Gonianthes lindeniana* A. Rich., cited the material studied as "Crescit in insula Cuba, ubi detexit et benigne communicavit clar. Linden," without citing the herbarium of deposit.

Borhidi et al. (2017:445) cited the type of *Gonianthes lindeniana* as "Tipo: Linden, tab. 49." It is unknown to me to which Linden table he made this reference. Also, according to the *Code*, starting from 1 January 2001, the designation of a lectotype or a neotype must be accompanied by "here designated" or a similar expression. Hence, Borhidi et al. (2017:445) type citation cannot be treated as an inadvertent neotype designation.

In P, where Achille Richard worked, there are two specimens of *Linden 1799* associated with this name. The specimen with barcode P02273499, has a label with the heading "Herbarium Richard" handwritten in red ink, and the annotation "Gonianthes Lindeniana nob. Cuba. M. Linden (no. 1799)" handwritten in black ink by Achille Richard. This specimen, consisting of five leaves and two corollas, is the holotype of *G. lindeniana*.

The other P specimen, with barcode P00582089, has a label the printed heading "HERB. MUS. PARIS" and the annotations "Portlandia gypsophyla Macf.? San Yago_Cuba_M. Linden Cat. N°_1799." This specimen, not annotated by Richard, consists of a branch with several leaves, two loose leaves, and a separate corolla, and is an isotype.

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I started working on members of the tribe Chiococceae while I was a Ph.D. Student at University of Texas at Austin, during 1990–1996, under the guidance of Billie L. Turner (1925–2020). During the following decades, I continued to study this group, with projects focusing on morphology, floristics, palynology, taxonomy, phylogeny, and systematics. Due to my moves to different institutions and numerous concurrent long-term projects, the study of this tribe was stopped and restarted several times. This gave me the opportunity to visit numerous herbaria and undertake important field work in many Neotropical countries.

My first expedition dedicated to the Chiococceae was made in Jamaica, in July 2001, accompanied by Tim Motley (1965–2013; then at the New York Botanical Garden), George Proctor (1920–2015; Institute of Jamaica, Natural History Division, Kingston), Andreas Oberli (Hope Gardens, Kingston), Luke Lee, and Kevin Boswell (Forestry Department of Jamaica). During that expedition, I observed and collected natural populations of all the species of *Portlandia*, and several species of *Chiococca*, *Exostema*, *Erithalis*, and *Phialanthus*. My second expedition dedicated to the Chiococceae was made in Dominican Republic, also in July 2001, accompanied by Teodoro Clase (Jardín Botánico Nacional, Santo Domingo). During the expedition in Dominican Republic, I had the occasion to observe and collect natural populations of numerous species of *Catesbaea*, *Chiococca*, *Cubanola*, *Erithalis*, *Exostema*, *Isidorea*, *Scolosanthus*, and *Solenandra*. Funds for field-work in Jamaica and Dominican Republic were provided by the Lewis B. and Dorothy Cullman Foundation, the Plant Genomics Consortium, and The New York Botanical Garden.

My third expedition dedicated to the Chiococceae took place in Cuba, from June to August 2002. Numerous local botanists helped me with logistics, obtaining permits, collecting and processing specimens, assistance with herbarium work, and accompanying me during field trips: Ramona Oviedo-Prieto, Lázara Sotolongo Molina, Daisy Albert, and Mayra Fernández, all of them of Instituto de Ecología y Sistemática, Cuban Academy of Sciences, La Habana. Their contribution was crucial for the realization of field work, during which I observed and collected the natural populations of numerous species, most of them endemic to Cuba, of *Catesbaea*, *Ceratopyxis*, *Chiococca*, *Cubanola*, *Exostema*, *Isidorea*, *Phialanthus*, *Ramonadoxa*, *Schmidtottia* (incl. *Ceuthocarpus*), *Scolosanthus*, and *Siemensia*. I flew from Cuba to the USA with eight boxes of herbarium specimens, half of the boxes containing my collections, and the other half containing loans of Chiococceae specimens from HAC and HAJB. At my arrival at the New York airport on 31 August 2002, all the boxes were confiscated by the US Department of Agriculture for custom control, and were released to me three months after. Funds for field work in Cuba were provided by the American Council of Learned Societies/Social Science Research Council Working Group on Cuba.

Field observations of *Chiococca alba* and *Coutarea hexandra* in Central-Western Brazil, in the states of Goiás, Tocantins and Mato Grosso, were made during 2004–2008, while I was working as a Visiting Scientist at the Federal University of Goiás (UFG), with a fellowship from the Conselho Nacional de Pesquisa (CNPq) of the Brazilian Government (grant 309885/2003–5). During that period I also had the occasion to study several populations of *Salzmannia* on the costal dunes of the state of Bahia. Special help during that period was provided by Juliana Costa da Silva (now my wife), who accompanied me during numerous expeditions in those regions.

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