

Taxonomic studies of *Myrcia* (*Myrciinae*, *Myrtaceae*) in Brazil: morphological novelties, circumscriptions, and new records for the Amazon¹

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ABSTRACT – Based on recent studies on Myrtaceae in the Brazilian Amazon, we present an update of the morphological circumscription of *Myrcia*, including eight new occurrences of the genus in Pará State, three of which represent new records for the Amazon region. Comments are provided on the diagnostic features and taxonomic affinities of each species, their geographic distributions, and their preferred environments of occurrence. Recommendations for updating the list of Brazilian Myrtaceae species are presented.

Keywords: Brazilian Amazon, geographic distribution, taxonomy

RESUMO – Estudos taxonômicos em *Myrcia* (*Myrciinae*; *Myrtaceae*) no Brasil: novidades morfológicas, circunscrição e novas ocorrências para a Amazônia. Baseado em recentes estudos em *Myrtaceae* para a Amazônia brasileira, apresenta-se uma atualização da circunscrição morfológica de *Myrcia* e oito novos registros de ocorrência do gênero no estado do Pará, dos quais três também representam novas ocorrências para a Amazônia brasileira. Comentários sobre características diagnósticas e afinidades taxonômicas de cada espécie, bem como os respectivos dados de distribuição geográfica e ambientes preferenciais de ocorrência são fornecidos. Recomendações para atualização da lista de espécies de *Myrtaceae* da flora do Brasil também são apresentadas.

Palavras-chave: Amazônia brasileira, distribuição geográfica, taxonomia

INTRODUCTION

Myrtaceae has traditionally been divided into two tribes: *Leptospermeae*, with capsular fruits and exclusively paleotropical distribution; and *Myrteae*, with fleshy fruits and most species occurring in South America. *Myrteae* comprises three subtribes: *Myrciinae*, *Eugeniinae*, and *Myrtinae* (Lucas *et al.* 2005, 2011). A new classification for *Myrtaceae*, however, proposes two subfamilies (*Psiloxylloideae* and *Myrtoideae*) and 17 tribes (Wilson *et al.* 2005, 2011). According to Lucas *et al.* (2007), the genus *Myrcia* belongs to the tribe *Myrteae*, which is expressive in Brazil, and currently unites eight informal groups, two of which have uncertain positions in the phylogeny of that group. Also according to these authors, the ‘*Myrcia* group’ covers all taxa previously included in the subtribe *Myrciinae* and the genus *Mitranthes* O. Berg.

The subtribe *Myrciinae* is represented in Brazil by three genera and 373 species, of which 289 are endemic; there

are three genera and ca. 90 species in the Amazon biome (Sobral *et al.* 2012). This represents a very complex plant grouping from a taxonomic point of view, especially in terms of the generic delimitations. According to Rosário (2012) and Sobral *et al.* (2012), the genera of this subtribe have high numbers of species in the Brazilian Amazon (except *Gomidesia* O. Berg), with *Calyptanthes* Sw., (ca. 26 spp.), *Marlierea* Cambess. (ca. 13 spp.), and *Myrcia* DC. (ca. 52 spp.).

According to McVaugh (1958), and Rosário *et al.* (2014a, 2014b), *Calyptanthes* and *Marlierea* are well known in South America, and distinguishable primarily by a dehiscent calyx and the exposure of the corolla in the floral bud (pre-anthesis): dehiscent calyx and exposed corolla in *Myrcia* and *Gomidesia*; and indehiscent calyx and enclosed corolla in *Calyptanthes* and *Marlierea*.

Several studies have highlighted taxonomic and floristic controversies in recognizing *Calyptanthes*, *Gomidesia*, *Marlierea*, and *Myrcia* as distinct taxa. Studies have

generally pointed to the dehiscent calyx (and the resulting exposure of the corolla in the floral bud – mistakenly considered for many years as “closed bud” x “open bud”), the formation or not of distinct sepals, as well as the shape of the hypanthium apex, the persistent calyx, and/or anther dehiscence as the most valuable diagnostic features (McVaugh 1958, 1969; Legrand & Klein 1969; Barroso *et al.* 1984; Kawasaki 1989; Nic Lughadha 1995; Holst *et al.* 2003; Sobral 2003; Souza *et al.* 2007).

Myrcia has Neotropical distribution and is uniquely American (McVaugh 1969). This author also mentions that the number of species in the genus is uncertain, but is believed to be more than 300, of which ca. 66% occur in Brazil. Sobral *et al.* (2012) determined that *Myrcia* is represented by 243 species in Brazil, with 52 in the Brazilian Amazon and 28 found in Pará State.

Recent taxonomic studies of *Myrciinae* have indicated new morphological features that extend the circumscriptions of its genera, new synonyms, and new records for the Brazilian flora and the Amazon region, as well as for the states of Amazonas and Pará (Rosário 2012). Continuing these studies, the present work provides additional data for the morphological circumscription of *Myrcia*, and described eight new occurrences for Pará State – three of which are also new for the Brazilian Amazon, and one for Brazil. Comments are made concerning circumscriptions, taxonomic affinities, and information concerning their geographic distributions and the vegetation formations where the species are found in Brazil is provided. It is worth noting that the identifications of eight new *Myrcia* records argue for updating the list of *Myrtaceae* species of Brazilian floras (Sobral *et al.* 2012).

MATERIALS AND METHODS

The surveys of herbarium collections principally considered herbaria in northern Brazil (EAFM, IAN, INPA, MG), as well as the collections of R, RB, BHCB and UB and photographic reproductions of the nomenclatural types of *Myrciinae* deposited in the BM, BR, F, K, MICH, M, MO, NY, P, US and U herbaria (acronyms according to Thiers 2012). The abbreviations of the authors' names and the genera and species follow Brummitt & Powell (1992). Species identifications were performed with the aid of the specialized literature (Amshoff 1948; Holst *et al.* 2003; Souza *et al.* 1999; McVaugh 1958, 1969; Rosário *et al.* 2005, 2014a, 2014b; Rosário & Secco 2006, 2013), using material identified by experts, type specimens, photographs and/or scanned images, as well as consultations with *Myrtaceae* specialists. We analyzed material from the study areas and, when necessary, additional collections were consulted. Illustrations were made, and phenological data, geographic distributions, and taxonomic affinities were cited and comments on distributions in Brazilian phytogeographies are provided. Morphological analyses and laboratory measurements were performed with the aid of a CARL ZEISS® stereoscopic

microscope. The morphological characterizations used the concepts of McVaugh (1956, 1968, 1969), Radford *et al.* (1974), and Barroso *et al.* (1999). The characterizations of the phytogeographies were based on the vegetation classification proposed by Pires & Prance (1985). Information concerning the flowering periods (buds in pre-anthesis, and fully open) and fruiting (ovaries starting to develop, and ripe fruits ready for dispersal) of the species was gathered from the literature and from herbarium labels.

RESULTS AND DISCUSSION

Myrcia DC., Dict. Class. Hist. Nat. 11: 378, 401, 406. 1827. [*emend.* A. Rosário & Baumgratz]

Trees or shrubs, rarely lianas. Inflorescences in panicles or reduced to panicles of racemes (racemiform) or panicles of fascicles (fasciculiform), rarely panicles of dichasia, unifloral or in pairs, or multiflorous, rarely pauciflorous; bracts and bracteoles deciduous or persistent after anthesis. Flowers sessile or pedicellate; hypanthium extended ca. 1 mm beyond the ovary apex, or reduced; calyx usually with valvate pre-flowering, sometimes quincuncial, (4-)5-merous, regular sepals, free; corolla (4-)5-merous, regular petals, free; disk zone glabrous or pilose; ovary 2(-3)-locular, (1-)2 ovules per locule, glabrous or pilose at apex; placentation axillary. Fruit bacciferous, 1-2(-3) seeds, with calyx and staminal disk often persistent; myrcioid embryos.

Myrtaceae experts have used the expressions “open bud or closed bud” for many years to characterize the floral buds in *Myrcia*, these being viewed as distinctive and practical characters for the systematics of *Myrciinae* - “open buds” being associated with *Myrcia* and “closed buds” with *Calypttranthes* and *Marlierea*. However, this characterization was not adopted in the present study, as we followed the proposal of Rosário (2012), who described the morphologies of the floral buds of *Myrciinae* based primarily on calyx dehiscence. This author, and Rosário *et al.* (2014a, 2014b), concluded that these features are the most diagnostic for distinguishing between *Calypttranthes*, *Marlierea*, and *Myrcia* and, in practice, very useful in the systematics of Amazonian species. It is noteworthy, on the other hand, that, disregarding these characteristics of the calyx and accepting that these taxa constitute a single monophyletic generic entity (as has been suggested by Lucas *et al.* 2007, 2011), all the species belonging to these genera should be subordinated to *Calypttranthes* by the rule of priority, as was pointed out by Rosário *et al.* (2014b). Thus, given these recent studies of the Amazonian *Myrciinae*, two basic morphological patterns of the calyx and corolla during anthesis can be recognized: (1) together, they constitute a fused floral entity covering the androecium and gynoecium (without distinction between the calyx and corolla), with the dehiscence of these structures occurring simultaneously (in *Calypttranthes* and *Marlierea*); in this situation, the dehiscence of the calyx serves to distinguish these two

taxa from each other, with the calyx in *Calyptanthes* being circumscised and forming a calyptra, caducous or not, while in *Marlierea* being partially or totally irregular, forming sepals of irregular sizes and shapes; (2) *Myrcia* shows a clear distinction between the calyx and corolla during the anthesis, and the dehiscence of these two structures do not occur simultaneously, with dehiscence of the corolla initiating after the calyx is fully open; in this situation, the pre-flowering of the calyx is valvate or quincuncial, forming regular sepals, rarely irregular.

This study, and the work of Rosário (2012), which covers the Amazon region, provides new morphological data that will expand our knowledge of the morphology of the genus *Myrcia* and, therefore, its circumscription. In this context, the lianescent habit of *M. huallagae* (a species restricted to the Amazon Biome) and flowers with calyx of valvate or quincuncial pre-flowering, with sepals regular in shape and size, rarely irregular, are incorporated into the *Myrcia* circumscription, as well as that of the *Myrtaceae* of Brazil. Equally, it highlights the importance of regional floras, particularly of the Amazon Biome that analyze several herbarium collections to more precisely define the taxonomy of the species occurring in Brazil – thus complementing and updating the circumscriptions of complex genera such as *Calyptanthes*, *Marlierea*, and *Myrcia*, and the systematics of the family.

According to Sobral *et al.* (2012), *Myrcia* is represented by 28 species in Pará State, although Rosário (2012) recognized 31 species – of which *Myrcia huallagae* McVaugh, *Myrcia laruotteana* Cambess., *Myrcia mansoniana* O.Berg, *Myrcia ovata* Cambess., *Myrcia albidotomentosa* (Amshoff) McVaugh, *Myrcia amapensis* McVaugh, *Myrcia clusiifolia* (Kunth) DC., *Myrcia revolutifolia* McVaugh, and *Myrcia saxatilis* (Amshoff) McVaugh are addressed in this work in different taxonomic and biogeographic contexts.

Novelty for the morphological circumscription of *Myrtaceae* in Brazil

Myrcia huallagae McVaugh, Fieldiana, Bot. 29(3): 192. 1956.

(Figs. 1 A-C)

According to Sobral *et al.* (2012) and Rosário (2012), *Myrcia huallagae* McVaugh is endemic to the Amazon region, occurring in Peru and being widely distributed in Brazil (in the states of Pará, Amazonas, Acre, Rondônia). It is found in *capoeira* forests (secondary upland vegetation). In Pará, this taxon is represented by only a single collection.

Myrcia huallagae is similar to *Myrcia bracteata* (Rich.) DC., but is distinguished by being a liana, with trichomes 3-4 mm long on the branches, and sessile leaves (vs. shrubs to trees, with trichomes on the branches 0.5-2 mm long, and distinctly petiolate leaves in *M. bracteata*). Thus, the lianescent habit appears exclusively in this taxon in the Amazon. Importantly, McVaugh (1956) mentioned

the lianescent habit in the original work on *M. huallagae* for Peru, which reinforces the inclusion of this feature in the circumscription of *Myrcia*, as well as in the Brazilian *Myrtaceae*. This new feature completes information about the family in lists of the Brazilian flora (Sobral *et al.* 2012). This species is popularly known in the Amazon region as “murta cabeluda” (hairy myrtle, in Portuguese).

Specimens examined: BRAZIL. PARÁ: Benfica, 24.X.2006, bot., fl., *D. Mitja & D.C. Carvalho 10123* (MG).

New records for the Brazilian Amazon

Myrcia laruotteana Cambess., Fl. Bras. Merid. 2: 311. 1832.

(Figs 1 D-F)

This species is recorded here for the first time in the Brazilian Amazon, as well as for the first time in Pará State, where it occurs in *terra firme* (primary and secondary upland) and *várzeas* (floodplain) forests. The leaves are strongly chartaceous, with conspicuous venation, with pubescent trichomes restricted to the midrib – diagnostic characters distinguishing it from other *Myrcia* taxa from the Amazon region. It is noteworthy that the sessile leaves, as well as the albescent-tomentose bracts isolated or forming a rosette at the base of the inflorescence rachis and common in specimens from the Brazilian Cerrado (tropical savanna), were not observed in the Amazon collections. Species from southern and southeastern Brazil, in the Atlantic Forest biome, are likewise devoid of these morphological characters.

Thus, considering the wide distribution of *M. laruotteana* in Brazil (in the states of Pará, Tocantins, Maranhão, Mato Grosso, Goiás, Distrito Federal, Mato Grosso do Sul, Minas Gerais, Espírito Santo, São Paulo, Paraná, and Santa Catarina), preferentially in *terra firme* and *várzea* forests, it can be inferred that their observed morphological variations may be associated with the different environments in which the individuals occur, characterizing them as plastic vegetative structures. *Myrcia laruotteana* is popularly known in the Amazon as myrtle and “goiabinha-casca-lisa” (small guava with a smooth skin, in Portuguese).

Specimens examined: BRAZIL. PARÁ: Parauapebas, Serra dos Carajás, FLONA, 18.VII.1990, bot., *N.A. Rosa 5285* (MG); Gurupi River, 6.I.1910, bot., *F. Lima s.n.* (MG 10752); Peixe-Boi, Monte Verde Farm, 01°11'S, 47°19'W, 11.III.1991, fr., *R.P. Salomão et al. 775* (MG); Oriximiná, Trombetas River, Mineração Rio do Norte, XII.1999, fl., fr., *M.F. Quintela s.n.* (MG 159950). MATO GROSSO: Luciara, Distrito de Porto Alegre, 11°10'S, 51°40'W, 16.X.1985, fl., *J. Pirani 1294* (MG).

Myrcia mansoniana O. Berg, Fl. Bras. 14(1): 163. 1857.

(Figs. 1 G, H)

This species is recorded here for the first time in the Brazilian Amazon, occurring only in Pará State and restricted to the Serra do Cachimbo where it occurs in *terra firme* (primary upland) forests and in submontane areas with rocky outcrops (Rosário 2012). According to Sobral *et al.* (2012), this species is endemic to Brazil (Mato Grosso and Goiás States), with its center of distribution in the Cerrado biome. Thus, the species appears to have a disjunct distribution in two biomes with ecological conditions that favor its development (Rosário 2012). *Myrcia mansoniana* is similar to *M. mollis* (Kunth) DC., which can be primarily recognized by their velutinous vegetative and reproductive structures. However, *M. mansoniana* can be distinguished by having velutinous petioles on the young branches, and rusty trichomes on the peduncle, disc zone, and fruits (vs. sericeous-pubescent indument, with albescent to golden trichomes in *M. mollis*). Despite not having been able to analyze material with buds and flowers, we infer that the pre-flowering is of the quincuncial type, as the sepals on the fruits partially overlap each other.

Specimens examined: BRAZIL. PARÁ: Itaituba, Serra do Cachimbo, Cachoeira de Curuá, north of the mountain slope, 05.XI.1977, fr., *G.T. Prance et al.* 24882 (MG).

Myrcia ovata Cambess., Fl. Bras. Merid. 2: 319. 1832.
(Figs. 1 I, J)

According to Sobral *et al.* (2012), this species is endemic to the Atlantic Forest (in the states of Espírito Santo, São Paulo, and Rio de Janeiro), although it is cited here for the first time from Pará State and the Brazilian Amazon. It is found there as a subshrub to shrub in *restinga* environments (sandy coastal shrubby vegetation) and bordering secondary vegetation. *Myrcia ovata* distinguishes itself from other species of the genus by its subshrub or shrubby habit, distinctly oval leaves, glabrous, with marginal rib 2-4 mm distant from the margin, short petioles, canaliculated and glabrous flowers, with short pedicels (ca. 1 mm long). Rosário (2012) noted that many of the *M. ovata* collections deposited in the RB herbarium come from *restinga* environments in Rio de Janeiro State, which suggests that this is its preferred environment, although it is now known to have a disjunct distribution between the Amazon and Atlantic Forest biomes, indicating the states of Pará and Rio de Janeiro as distribution centers in their respective regions.

Specimens examined: BRAZIL. PARÁ: Tucuruí, BR-263, 03°30'S, 49°32'W, 28.X.1981, fl., *D.C. Daly et al.* 975 (INPA, MG, NY); Maracanã, Ilha de Fortalezinha, XII.1999, fl., *L.C.B. Lobato et al.* 2473 (MG); *ibid. loc.*, XII.1999, fl., *A.S. Rosário & L.C.B. Lobato 01* (MG); Maracanã, Maiandeuá, near the hole of Cambuinha, 20.IX.2007, fl., *A.S. Rosário et al.* 34 (MG); Maracanã, Maiandeuá, near the hole of Cambuinha, 20.IX.2007, fr., *A.S. Rosário et al.* 35 (MG); Tomé-Açu, 1,500 m away from the Curiman Farm, 05.I.1978, bot., *O.C. Nascimento*

423 (INPA, MG, NY); Moju, Maiza Farm, 03.VIII.1994, bot., *I.A. Rodrigues 1616* (IAN).

New records for the state of Pará

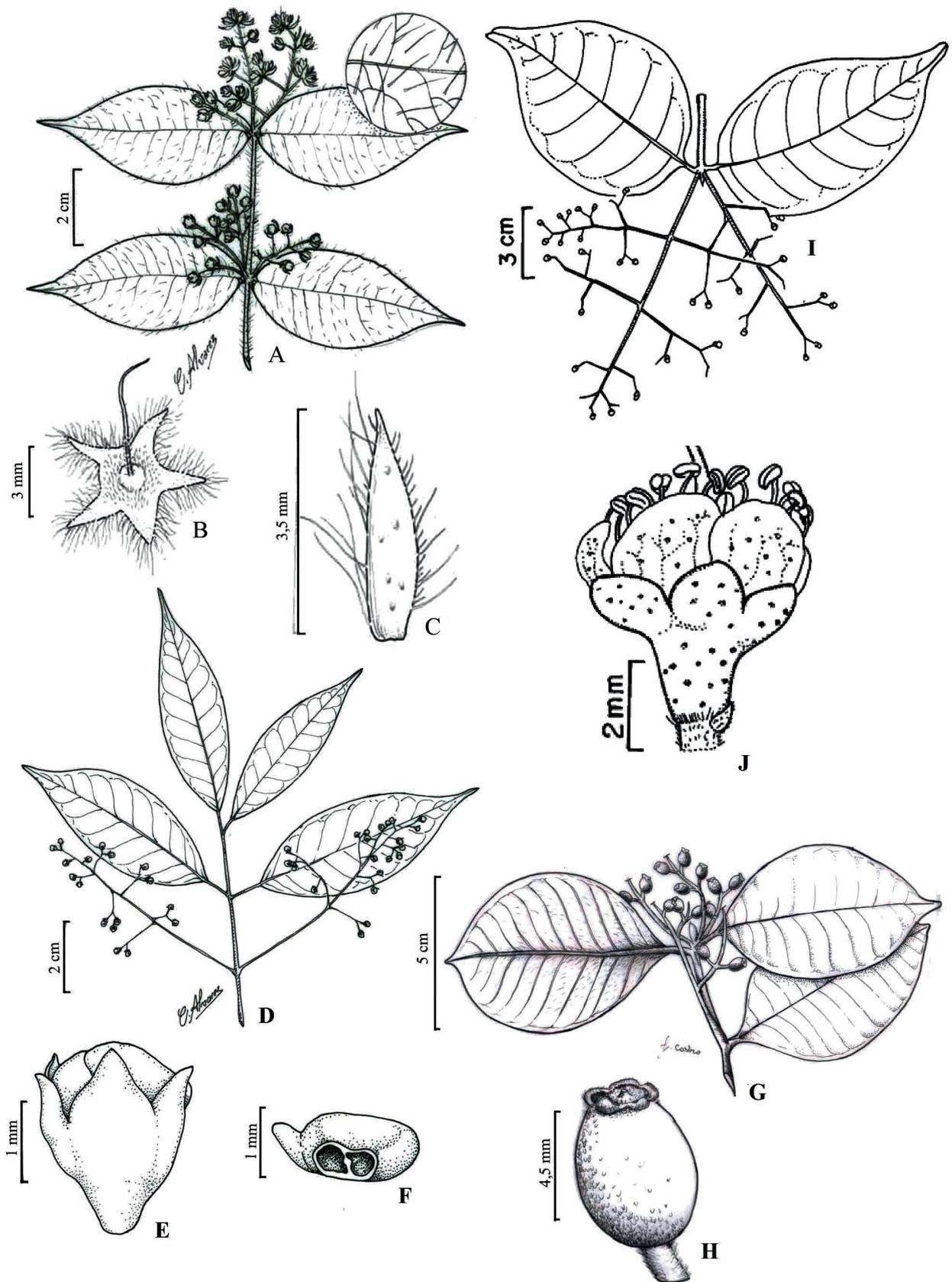
Myrcia albidotomentosa (Amshoff) Mc Vaugh, Mem. New York Bot. Gard. 18(2): 79. 1969.
(Figs. 2 A, B)

This species is recorded here for the first time for Pará State. According to Holst *et al.* (2003), this taxon occurs in montane forests (100-1,000 m) in Venezuela, Guyana, and Suriname. In Brazil, it occurs at the edges of *campina* (in the eastern Amazon, Pará State) and in savanna vegetation, specifically in montane fields in the Serra Aracá Mountains (in the western Amazon, Amazonas State). *Myrcia albidotomentosa* has its distribution restricted to the Amazonian Biome, occurring in grasslands in the states of Pará and Amazonas; there are very few specimens in herbaria in the Brazilian Amazon. Its recognition is facilitated by having leaf blades with acute to acuminate apices, translucent glands in the form of nigrescent dots, tenuous inter-secondary ribs, and flowers with albescent and tomentose induments, making it distinct from other representatives of the genus in the Amazon region. Resembles *M. pyrifolia* (Desv. ex Ham.) Nied. and *M. tomentosa* (Aubl.) DC. by having albescent-tomentose induments on its vegetative and reproductive structures, but is quite distinct by having a 4-merous calyx, with sepals of similar dimensions, and a pilous disk zone between the filaments (vs. calyx (4)-5-merous, sepals in two sets, 3-4 larger, 1-2 smaller, and disk zone completely pilous in *M. pyrifolia*; and 5-merous calyx and glabrous disk zone in *M. tomentosa*).

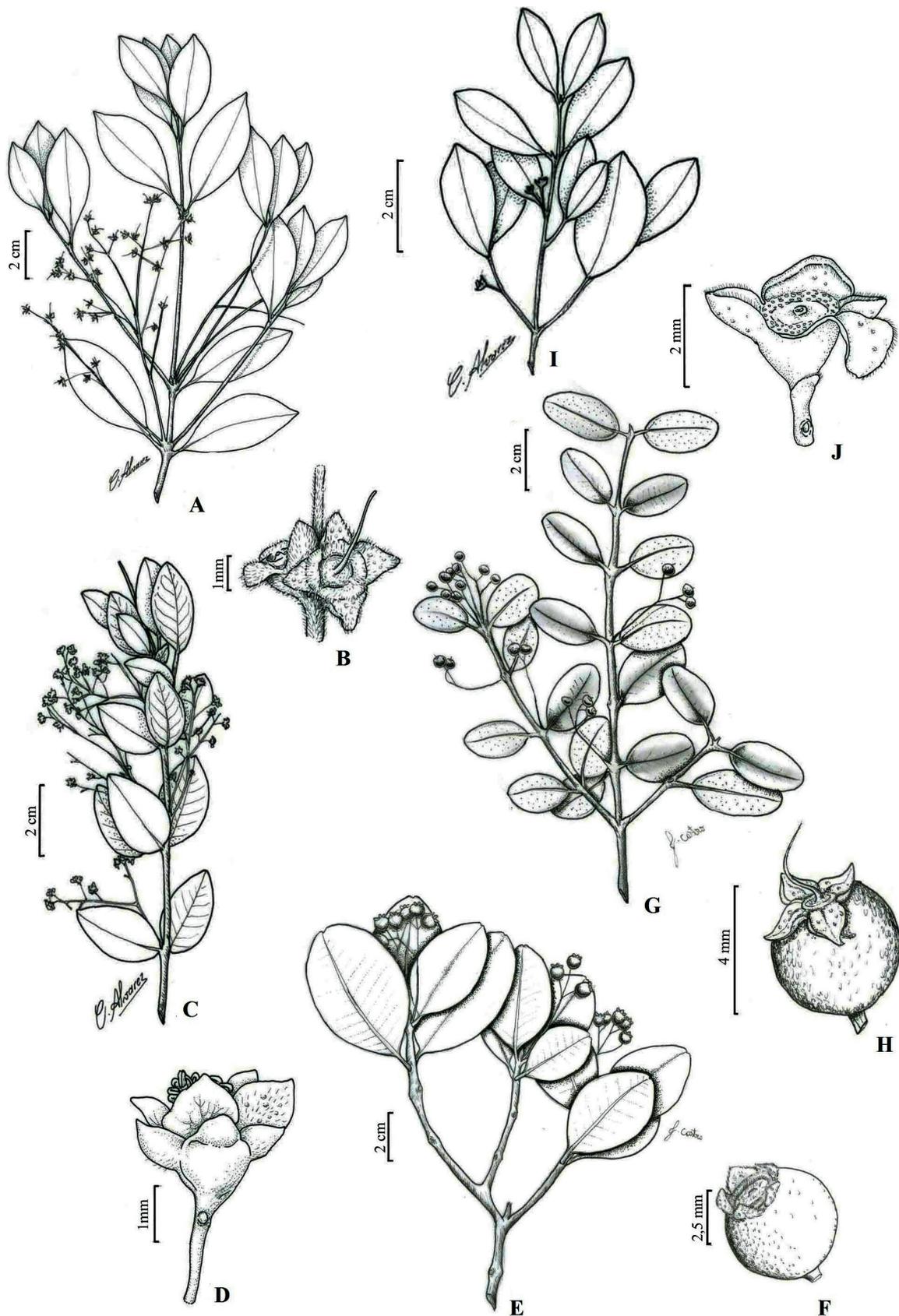
Specimens examined: BRAZIL. PARÁ: Colares, 18.VIII.1913, fl., *A. Ducke s.n.* (MG 12671). AMAZONAS: hillside of the Serra Aracá, 04.II.1978, bot., *N.A. Rosa & S.B. Lira 2371* (INPA, MG, NY).

Myrcia amapensis Mc Vaugh, Mem. New York Bot. Gard. 18(2): 80. 1969.
(Figs. 2 C, D)

Until recently, *Myrcia amapensis* was considered endemic to Brazil, being restricted to Amapá State (Sobral *et al.* 2012). In the present study, however, it is recorded from Pará State, where it occurs in *campinarana* (sandy plains with dense shrubby and arboreal vegetation), secondary forests and mainland savanna, together with predominant species of *Cyperaceae*, *Poaceae*, and other fire resistant plants. This species can be easily confused with *M. saxatilis* (Amshoff) Mc Vaugh when sterile due to its tiny leaf blades (up to ca. 3.5 cm long) and the absence of indument. However, it can be distinguished mainly by having inflorescences in panicles and calyx 5-merous, with quincuncial pre-flowering (vs. unifloral inflorescences or dyads, and calyx 4-merous, with valvate pre-flowering in *M. saxatilis*). It is popularly known in the Amazon region



Figs. 1 A-J. A-C. *Myrcia huallagae*. A. Flowering branch; B. Flower, front view; C. Bract, showing adaxial side. D-F. *Myrcia laruotteana*. D. Flowering branch; E. Flower bud, showing calyx with valvate pre-flowering; F. Ovary 2-locular, cross-section. G, H. *Myrcia mansoniana*. G. Fruiting branch; H. Fruit, lateral view. I, J. *Myrcia ovata*. I. Flowering branch; J. Flower, showing valvate pre-flowering. (A-C. D. Mitja & D.C. Carvalho 10123; D-F. F. Lima s.n. (MG 10752); G, H. G.T. Prance et al. 24882; I, J. A.S. Rosário 01 & L.C.B. Lobato).



Figs. 2 A-J. A, B. *Myrcia albidotomentosa*. A. Flowering branch; B. Flower, front view. C, D. *Myrcia amapensis*. C. Flowering branch; D. Flower, lateral view. E, F. *Myrcia clusifolia*. E. Fruiting branch; F. Fruit. G, H. *Myrcia revolutifolia*. G. Fruiting branch; H. Fruit, lateral view. I, J. *Myrcia saxatilis*. I. Flowering branch; J. Flower, lateral view (A, B. A. Ducke *s.n.* (MG 12671); C, D. J.M. Pires *et al. s.n.* (MG 123182); E, F. N.A. Rosa 251; G, H. R. Lisboa *et al.* 6666; I, J. L.C.B. Lobato *et al.* 3794).

as “murta de pajé” (witchdoctor’s myrtle, in Portuguese). **Specimens examined:** BRAZIL. PARÁ: Sete Varas in Curuá River, 00°95’S, 54°92’W, 4.VIII.1981, fl., fr., *J.J. Strudwick & G.L. Sobel 4013* (MG); Almeirim, Monte Dourado, MTD-Oeste Road, 22.VIII.1985, fl., *J.M. Pires et al. s.n.* (MG 123182); Almeirim, Monte Dourado, Água Azul area, near the glebe of Angelim da Reserva Genética, 17.IX.1986, fl., *J.M. Pires & N.T. Silva s.n.* (MG 123480).

Myrcia clusiifolia (Kunth) DC., Prodr. 3: 245. 1828.
(Figs. 2 E, F)

Based on McVaugh (1969), this species is endemic to the Amazon region, occurring in Venezuela and Brazil. According to Sobral *et al.* (2012), *M. clusiifolia* can be found in the states of Amapá and Amazonas. It is recorded here for the first time, however, for Pará State, from a single collection made in a *campina* environment. It can be inferred, based on the specimens analyzed and Rosário (2012), that the center of distribution of *M. clusiifolia* in the Brazilian Amazon corresponds to Amazonas State. When sterile, *M. clusiifolia* may be confused with *M. marginata* O.Berg, mainly by having oval leaf blades, markedly coriaceous, with cuneate to slightly obtuse bases and an obtuse to retuse apex. However, *M. clusiifolia* distinguishes itself by having glabrous leaves and rachis inflorescence 4-7 cm long and glabrous (vs. pubescent leaves and rachis inflorescence greater than 10 cm long in *M. marginata*). This species shows morphological variations in the pilosity of its petioles. While the specimen from Pará has a pubescent indument coating the entire structure, the samples from Amazonas State have a glabrous petiole or rarely with pubescent trichomes, these being sparse, however, and restricted to the canaliculated region on the adaxial face.

Specimens examined: BRAZIL. PARÁ: Sub-Base Marapí, margin of the Marapí River, 00°37’01”N, 55°58’00”W, 21.X.1974, fr., *N.A. Rosa 251* (IAN, RB). AMAZONAS: Manaus, Tarumã River, 23.VIII.1949, fl., *R.L. Fróes 25103* (IAN); Itaubal, Aracá River, 26.X.1952, *R.L. Fróes 29123* (IAN, MICH); Manaus-Caracará road, km 130, 25.V.1974, fl., *W.A. Rodrigues et al. 9301* (INPA, RB); surroundings of Serra Aracá, 25.II.1977, bot., *N.A. Rosa & M.R. Cordeiro 1653* (INPA, MG); Serra Aracá, 00°49’N, 63°19’W, 06.II.1984, fr., *G.T. Prance et al. 28826* (INPA, NY, RB); Barcelos, 00°52’29”S, 63°20’29”W, 20.VIII.2011, fl., *G. Martinelli et al. 17113* (RB).

Myrcia revolutifolia McVaugh, Mem. New York Bot. Gard. 18(2): 121. 1969.

(Figs. 2 G, H)

This species is recorded here for the first time for Pará State, where it occurs in *campina* environments (sandy plain shrubby vegetation). According to McVaugh (1969), *M. revolutifolia* has restricted distribution in mountainous regions of Venezuela (Amazon region) called “Cerro

Coro-Coro” and “Cerro Duida”, at altitudes from 1,200 to 2,300 m. In spite of recognizing their morphological affinities and their similar areas of occurrence, this author considered *M. planifolia* McVaugh and *M. revolutifolia* to be autonomous species and placed them in the section *Aulomyrcia* (O.Berg) Griseb. Holst (2002) considered these species to be synonymous, which was not ratified by the present study, as *M. revolutifolia* can be distinguished from *M. planifolia* by the latter having pubescent inflorescences (vs. glabrous in *M. revolutifolia*) and revolute leaves (vs. flat), in addition to occurring in “Cerro Duida” and “Cerro Coro-Coro (vs. “Sipapo”). Based on Prance (1982), the areas of occurrence of these species correspond to the Imeri center of endemism (refuge), which is made up of very old geological formations covering the far north of Brazil (the states of Roraima and Amazonas) to Colombia and Venezuela. The *Lisboa et al. 6666* collection represents the first and only record of *M. revolutifolia* for the Brazilian Amazon, being restricted to a *campina* formation that coincides with the Tapajós-Xingu center of endemism. The existence, so far, of only one specimen of *M. revolutifolia* in herbarium collections reinforces the rarity of this taxon in the Amazon biome. This species can be identified in the field by its aromatic leaves, as described on the label of the specimen analyzed, a feature not observed or recorded in the collections of *M. planifolia* that were analyzed (Rosário 2012).

Specimens examined: BRAZIL. PARÁ: Itaituba, São Luiz do Tapajós, campo dos perdidos, campina, 04°26’4.7”S, 56°03’0.2”W, 20.XI.1999, fr., *R. Lisboa et al. 6666* (MG).

Myrcia saxatilis (Amshoff) Mc Vaugh, Mem. New York Bot. Gard. 18(2): 105. 1969.

(Figs. 2 I, J)

Species with distribution in Suriname, French Guiana, and Brazil (McVaugh 1969, Rosário 2012). According to Sobral *et al.* (2012), *M. saxatilis* is endemic to the Amazon region, occurring in the states of Amapá and Amazonas, in *campinarana* and savanna vegetation. It is reported here for the first time for Pará State, where it is found in montane environments growing among *canga* (iron concretions) vegetation. *Myrcia saxatilis* resembles *M. amapensis*, but is easily distinguished as noted above.

Specimen examined: BRAZIL. PARÁ: Parauapebas, Serra dos Carajás, plateau N4, 12.I.2010, fl., *L.C.B. Lobato et al. 3794* (MG).

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