UNIVERSIDADE ESTADUAL DE CAMPINAS

INSTITUTO DE BIOLOGIA

JULIA MEIRELLES

FILOGENIA DE *Miconia* SEÇÃO *Miconia* SUBSEÇÃO *Seriatiflorae* E REVISÃO TAXONÔMICA DO CLADO ALBICANS (MELASTOMATACEAE, MICONIEAE)

PHYLOGENY OF Miconia SECTION Miconia SUBSECTION Seriatiflorae AND TAXONOMIC REVIEW OF THE ALBICANS CLADE (MELASTOMATACEAE, MICONIEAE)

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Tese apresentada ao Instituto de Biologia da Universidade Estadual de Campinas como parte dos requisitos exigidos para a obtenção do título de *Doutora em Biologia Vegetal*

Thesis presented to the Institute of Biology of University of Campinas in partial fulfillment of the requirements for the degree of Doctor in Plant Biology

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CO-ORIENTADOR: DR. FABIAN ARMANDO MICHELANGELI HERRERA

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RESUMO

Com mais de mil espécies, *Miconia* é um dos o maiores gênero de plantas Neotropicais. Entretanto, as análises filogenéticas recentes evidenciam sua artificialidade, bem como das suas seções e subseções. Consequentemente, faz-se necessária uma nova delimitação taxonômica para a tribo Miconieae como um todo. Na última filogenia do gênero, foram delimitados alguns grupos internos da seções *Miconia* e *Glossocentrum*, mais especificamente das espécies com folhas discolores, que são predominatemente brasileiras. A partir desta classificação preliminar, o presente estudo procurou, em primeiro lugar, entender as relações da seção *Miconia* subseção *Seriatiflorae*. Em seguida, procurou entender as relações especificas do clado Albicans, através de um tratamento taxonômico. O primeiro capítulo desta tese aborda o estudo das relações filogenéticas e evolução de caracteres morfológicos entre as espécies de *Miconia* sect. *Miconia* subseção *Seriatiflorae*. São apresentadas análises de parcimônia e de inferência bayesiana com 52 terminais. *Seriatiflorae* é polifilética com as espécies distribuídas em quatro clados e a relação entre eles não é bem resolvida em ambas análises. A presença de espécies apomíticas e poliplóides amplamente distribuídas pode ser indicativa de evolução reticulada e a falta de resolução entre os clado pode estar relacionada a hibridação interespecífica. Cerca de dez novas espécies foram descobertas durante o desenvolvimento desta tese e os manuscritos das quatro primeiras são apresentados no segundo capítulo: *Miconia astrocalyx*, *M. macuxi*, *M. rondoniensis e M. suberosa*. O terceiro capítulo é o tratamento taxonômico das 18 espécies do clado *Albicans,* todas com hábito arbustivo a arbóreo, folhas discolores com superfície abaxial recoberta por tricomas amorfos e inflorescências com ramos secundifloros e escorpióides. São espécies amplamente distribuídas desde o México ao Paraguai, ou endêmicas da Amazônia. Para tanto, foram analisadas mais de 2500 exsicatas em 18 herbários no Brasil e no exterior (BR, G, G-DC, HUEFS, IAN, INPA, JOI, K, M, MBM, MG, NY, P, RB, UEC, UPCB, US, W). Além das espécies descritas no capítulo 2, foi reconhecida a mudança de status de *M. argyrophylla* subsp. *gracilis* e proposto um novo nome, *M. mayarae*. Duas novas sinonímias foram estabelecidas: *M. cinerea* sob *M. stenostachya*, e *M. nambyquarae* sob *M. herpetica*. São apresentadas chave de identificação das espécies, descrições, lista completa de materiais examinados, mapas de distribuição geográfica, ilustrações, imagens e comentários das espécies.

Palavras chave: Miconieae, espécies novas, Amazônia

ABSTRACT

With more than a thousand species, *Miconia* is one of the largest Neotropical plant genus. However, the recent phylogenetic analyses showed its artificiality, as well as from its sections and subsections, then emerging the necessity of a new taxonomic delimitation for the entire tribe Miconieae. In the last genus phylogeny, it was delimited some internal groups from sections *Miconia* and *Glossocentrum*, more specifically from the species with discolors leaves, that are predominantly brazilian. From this preliminary classification, the present study aimed first to understand the relationship of section *Miconia* subsection *Seriatiflorae*. And second, more specifically, to understand the relations of the Albicans clade in its taxonomy. The first chapter of this thesis adresses the study of phylogenetic´s relationships and morphologial characters evolution between the species of the section *Miconia* subsection *Seriatiflorae*. There are presented parsimony analyses and bayesian inferences with 52 terminals. *Seriatiflorae* is polyphyletic with it´s species distributed in four clades and the relationships between them are not solved in both analyses. The presence of apomictic polyploid and widely distributed species can be indicative of reticulate evolution and the lack of resolution between clades can be related to interespecific hibridization. About ten new species were discovered during the development of this thesis and the manuscripts of four of them are presented in the secod chapter: *Miconia astrocalyx*, *M. macuxi*, *M. rondoniensis e M. suberosa*. The third chapter is the taxonomic treatment of the 18 species in the *Albicans* clade with shrubby to treelet habit, discolours leaves with abaxial surface covered by amorfous trichomes ans inflorescences with secundiflorous and scorpioid branches. This species are widely distributed from México to Paraguai, or endemics from Amazon. For this, were analysed more than 2500 exsicates in 18 herbaria in Brasil and abroad (BR, G, G-DC, HUEFS, IAN, INPA, JOI, K, M, MBM, MG, NY, P, RB, UEC, UPCB, US, W). Besides the species described in Chapter 2, it was recognized the status change of *M. argyrophylla* subsp. *gracilis* and proposed a new name, *M. mayarae*. Two new synonyms were established: *M. cinerea* under *M. stenostachya*, *M. nambyquarae* under *M. herpetica*. There are presented species identification key, descriptions, complete list of examined material, geographic distributional maps, ilustrations, images and commentaries about the species.

Key words: Miconieae, new species, Amazon.

SUMÁRIO

INTRODUÇÃO

A família Melastomataceae Juss possui cerca de 4470 espécies distribuídas em 150 gêneros, sendo que, aproximadamente, 3000 espécies ocorrem no Neotrópico e 1470, no Paleotrópico (Renner *et al.* 2011). No Brasil, está representada por 1370 espécies, distribuídas em 68 gêneros, dentre os quais os mais ricos em espécies são *Miconia* Ruiz & Pav. (282 spp.) (Goldenberg & Caddah 2015), *Leandra* Raddi (207spp.) (Baumgratz & Souza 2015) e *Tibouchina* Aubl. (167 spp.) (Guimarães, 2015).

As Melastomataceae apresentam diferentes hábitos, como: herbáceo, arbustivo, arbóreo, lianescente e epifítico. Morfologicamente, a família pode ser reconhecida pelas suas folhas opostas, com venação característica, na qual um ou mais pares de nervuras secundárias dispõem-se em arcos convergentes da base (ou próximo a ela) ao ápice da folha. As flores são geralmente bissexuais, com a corola radialmente simétrica, muitas vezes, com o androceu posicionando-se em direção a um único lado da flor. São flores diplostêmones, nas quais os estames, frequentemente, possuem conectivos espessados e prolongados, muitas vezes, apendiculados. Cerca de 2150–2350 espécies em 38 gêneros possuem frutos carnosos, enquanto 2000–2200 espécies em 112 gêneros possuem frutos capsulares (Clausing & Renner, 2001).

A última revisão taxonômica completa da família foi elaborada há mais de 120 anos por Cogniaux (1891) que a dividiu em três sub-famílias: Melastomatoideae, Astronioideae e Memecyloideae. O mesmo autor propôs, ainda, 11 tribos em Melastomatoideae: Microlicieae, Tibouchineae, Rhexieae, Merianieae, Bertolonieae, Miconieae, Blakeeae (ocorrentes nas Américas), *Osbeckieae*, Oxysporeae, Sonerileae e Dissochaeteae. Para a tribo Astronieae eram reconhecidos cinco gêneros ocorrentes na África, Ásia e Oceania, enquanto para a tribo Memecyleae, eram reconhecidos dois gêneros no velho mundo e apenas um nas Américas.

A história evolutiva das *Melastomataceae* começou a ser estudada em estudos cladísticos, com uso de caracteres morfológicos e anatômicos, para elucidar as relações entre as tribos e gêneros dentro da família (Renner, 1993). Outros estudos cladísticos,

usando caracteres morfológicos, foram publicados nas últimas décadas, envolvendo grupos da família, por exemplo, para os gêneros *Huberia* (Baumgratz 1996), *Tococa* (Michelangeli 2005), e *Adelobotrys* (Schulman e Hyvönen 2003).

A primeira filogenia molecular da família como um todo utilizou sequências das regiões do cloroplasto *rbcl, ndhf* e *rp116* e estabeleceu a classificação mais utilizada na atualidade, dividindo a família em nove tribos (Clausing & Renner 2001). Os recentes trabalhos com filogenia evidenciaram que, tanto o reconhecimento de Memecylaceae como uma família distinta de *Melastomataceae* como sua inclusão nessa família, são hipóteses que podem ser aceitas com bom suporte filogenético (Conti et al. 1996). Algumas hipóteses filogenéticas baseadas em dados moleculares já foram testadas para a família (Clausing e Renner 2001, Goldenberg et al. 2012); para as tribos *Miconieae* (Michelangeli 2004), *Microlicieae* (Fritsch et al. 2004), *Blakeeae* (Penneys et al. 2011), *Henrietteae* (Penneys 2010), *Cyphostyleae* (Michelangeli et al. 2011), *Melastomeae* (Michelangeli et al. 2013) e *Astronieae* (Penneys 2013) e, dentro de *Miconieae*, para os gêneros *Conostegia* (Kriebel et al. 2015), *Leandra* (Martin 2008, Reginato et al. 2014), *Miconia* (Goldenberg et al. 2008, Caddah 2013, Gamba e Almeda 2014), *Pleiochiton* (Reginato et al. 2010), *Physeterostemon* (Amorim et al. 2009) e *Pachyanthus* (Bécquer-Granados et al., 2008).

Miconieae é a tribo mais diversa da família, com cerca de 1800 espécies distribuídas em 19–23 gêneros, formando um grande clado exclusivamente neotropical (Michelangeli et al. 2008). A maioria das espécies da tribo *Miconieae* são árvores ou arbustos nativos das florestas tropicais e subtropicais úmidas, onde são importantes ecologicamente, devido a sua diversidade nos sub-bosques, representando também importante fonte de alimento para aves e mamíferos (Snow 1965, Kessler-Rios e Kattan 2012). Dentre as *Miconieae* também estão inclusas duas espécies de plantas invasoras das mais agressivas no Hawaii e nas ilhas do Pacífico Sul: *Clidemia hirta* D. Don (Wester e Wood 1977, Sherley 2000) e *Miconia calvescens* DC (Hardesty et al. 2012).

A tribo *Miconieae* tradicionalmente envolvia todas as espécies de *Melastomataceae,* exclusivamente neotropicais, com frutos carnosos e estames com

conectivos e apêndices pouco desenvolvidos (Triana 1871, Cogniaux, 1891). Dessa maneira, como foi delimitada inicialmente, foi reconhecida como parafilética, devido ao posicionamento dos gêneros *Bellucia* e *Henriettea* em um clado externo ao restante da tribo (Michelangeli et al. 2004). Após o reposicionamento de *Bellucia* e *Henriettea* na nova tribo *Henrietteae,* reconhecida por Penneys et al. (2010), *Miconieae* tornou-se monofilética e, atualmente, o principal dilema taxonômico do grupo em questão encontra-se na delimitação do seu maior gênero, *Miconia*: com mais de mil espécies, é um agrupamento não monofilético (Goldenberg et al. 2008).

Miconieae está posicionada como grupo irmão de *Physeterostemon* (Michelangeli et al. 2004, Amorim, et al. 2009). Distingue-se das demais tribos pelas flores com ovários totalmente ou parcialmente ínferos, que se desenvolvem em frutos carnosos, estames desprovidos de apêndices conspícuos no conectivo e pela ausência de megastilóides e brácteas imbricadas na base das flores (Michelangeli et al. 2004).

O gênero *Miconia* foi descrito por Ruiz e Pavón em 1794, com apenas três espécies. Meio século após sua a publicação, Naudin (1849-1853) propôs a primeira classificação infragenérica, que serviu de base para as classificações posteriores, elaboradas por Triana (1871) e Cogniaux (1891), e utilizada até os dias de hoje. A última monografia completa para o gênero *Miconia* está na obra de *Cogniaux* (1891). Nessa obra, *Miconia* foi dividida em onze seções: *Jucunda* (Cham) Triana ex. Hook.f., *Tamonea* Cogn., *Adenodesma* (Naudin) Cogn., *Octomeris (*Naudin) Triana ex Hook.f., *Laceraria* (Naudin) Triana ex Hook.f., *Miconia* DC., *Glossocentrum* (Cruegger) Triana, *Chaenanthera* (Naudin) Cogn., *Amblyarrhena* (Naudin) Triana ex Hook.f., *Cremanium* (D. Don) Triana ex Hook.f. e *Chaenopleura* (Rich ex. DC.) Triana ex Hook.f. A seção *Miconia* foi dividida em sete subseções (Cogniaux 1891): *Aplostachyae* Naudin, *Diplostachyae* Naudin*, Impetiolaris* Naudin*, Glomeratiflorae* Naudin*, Stenostachyae* Naudin, *Seriatiflorae* Naudin e *Paniculares* Naudin. Essa classificação de Cogniaux (1891) foi baseada naquelas de Triana (1871) e Naudin (1851). Cogniaux (1891) caracterizou a seção *Miconia,* baseado na morfologia dos estames. Segundo a sua chave, as espécies da seção *Miconia* possuem anteras curtas com ápice atenuado, deiscentes

através de um ou dois poros. O conectivo do estame é basalmente biauriculado ou biapendiculado na face ventral. A subseção *Seriatiflorae,* até então, reunia 31 táxons com inflorescências paniculadas, com ramos bi a trífidos, secundifloros.

O objetivo primário para a realização do presente trabalho foi inferir a filogenia do grupo de espécies da subseção *Seriatiflorae* para entender se ela representaria um grupo monofilético ou não. Para tanto, foram realizadas análises filogenéticas apresentadas no Capítulo 1, visando a uma melhor compreensão das hipóteses sobre a história evolutiva do grupo. Hipóteses: a) as *Seriatiflorae* formariam um grupo natural de espécies; b) as *Seriatiflorae* não formariam um grupo natural de espécies, mas seriam formadas por espécies semelhantes morfologicamente, porém com diferentes origens evolutivas. Foi realizada a reconstrução dos caracteres morfológicos para averiguação do quão informativos seriam os caracteres historicamente utilizados no delineamento da subseção *Seriatiflorae* (ex. tipo de ramificação das inflorescências: panículas com ramos escorpiódes). Após o desenvolvimento dessa etapa do trabalho, ocorreu a constatação do não monofiletismo do grupo; então, procuramos por um grupo natural com espécies inicialmente citadas na subseção *Seriatiflorae,* para realização de uma revisão taxonômica.

O segundo Capítulo traz quatro espécies novas com inflorescências escorpioides para a ciência. Três delas ocorrem em vegetações da Amazônia e uma delas na Chapada Diamantina.

Um dos clados com presença marcante de espécies de *Miconia* subsect. *Seriatiflorae* é o clado de *Miconia albicans,* que foi revisado taxonomicamente no terceiro capítulo. O clado inclui 18 espécies, sendo quatro delas descobertas neste trabalho. Tal escolha foi feita pelo fato de o grupo abranger algumas das espécies mais comuns e mais amplamente distribuídas do gênero, como *M. albicans*, *M. fallax* e *M. stenostachya*.

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Capítulo I. Filogenia em *Miconia* Ruiz & Pav. (Melastomataceae), sect. *Miconia* subsect. *Seriatiflorae* Naudin

(Manuscrito preparado nas normas do peródico Plants Systematic and Evolution)

Título. **Filogenia em *Miconia* Ruiz & Pav. (Melastomataceae), sect. *Miconia* subsect. *Seriatiflorae* Naudin**

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Resumo

Este estudo propõe-se a reconstruir a filogenia de *Miconia*, seção *Miconia*, subseção *Seriatiflorae,* para melhor compreensão das relações entre os táxons; refinar a circunscrição do grupo, e identificar possíveis sinapomorias morfológicas para clados e subclados. Foram incluídos 52 terminais (48 espécies), sendo 43 de *Miconia* (39 espécies) mais 9 grupos externos da tribo *Miconieae*. As hipóteses filogenéticas foram reconstruídas, utilizando seis regiões de DNA, sendo duas de espaçadores ribossômicos do núcleo (nrETS, nrITS) e quatro do cloroplasto (*acc*D-*psa*l, *atp*F-*atp*H, *psb*K-*psb*L e *trn*S-*trn*G). As matrizes de dados foram analisadas por meio de parcimônia e inferência bayesiana. Quarenta caracteres morfológicos foram otimizados sobre a árvore, de consenso estrito da análise de máxima parcimônia com todas as regiões combinadas. *Seriatiflorae,* como atualmente circunscrita, é parafilética em todas as análises. Entretanto

as espécies formam quatro clados bem sustentados e a relação entre eles é resolvida em parte das análises. Esses clados podem ser reconhecidos por sinapomorfias morfológicas, como: indumento e textura das folhas, coloração do indumento, tipo de tricomas, arranjo das flores nos ramos distais, indumento das pétalas e prolongamento do conectivo das anteras.

Palavras chave: Gênero megadiverso, inflorescências escorpióides, tipos de indumento.

1. Introdução

A família *Melastomataceae* é formada por um grupo natural de espécies tropicais e subtropicais composto por cerca de 4500 espécies e 150 gêneros (Renner et al., 2015). Seu monofiletismo não é questionável; apenas se discute sobre a inclusão de *Memecylaceae* como a subfamília *Olisbeoideae* (Stone, 2006) ou a sua exclusão como uma família à parte, *Memecylaceae* (Clausing e Renner, 2001). Em ambas as opções, a família permanece monofilética (Conti et al., 1996).

O maior gênero da família *Melastomataceae*, *Miconia* Ruiz & Pav. é também reconhecido como o maior gênero de angiospermas restrito ao Neotrópico. No trabalho mais amplo e mais recente sobre taxonomia e nomenclatura de *Miconia*, em sua atual circunscrição, foram listadas 1057 espécies (Goldenberg et al. 2013). Nos últimos dois anos, espécies novas foram descritas e outras transferidas de outros gêneros, elevando o número total para 1088 (Caddah e Goldenberg 2013; Chagas et al. 2013; Goldenberg e Chagas 2014; Meirelles e Goldenberg, 2014; Bacci e Goldenberg 2015; Burke e Michelangeli 2013; Judd e Majure, 2013; Kriebel e Oviedo 2013; Kriebel e Almeda 2013; Gamba et al. 2014; Gamba e Almeda, 2014).

A última monografia completa para o gênero *Miconia* está na obra de Cogniaux (1891) que ainda é utilizada atualmente. Nessa obra, *Miconia* foi dividida em onze seções: *Jucunda* (Cham) Triana ex. Hook.f., *Tamonea* Cogn., *Adenodesma* (Naudin) Cogn., *Octomeris (*Naudin) Triana ex Hook.f., *Laceraria* (Naudin) Triana ex Hook.f., *Miconia* DC., *Glossocentrum* (Cruegger) Triana, *Chaenanthera* (Naudin) Cogn., *Amblyarrhena* (Naudin) Triana ex Hook.f., *Cremanium* (D. Don) Triana ex Hook.f. e

Chaenopleura (Rich ex. DC.) Triana ex Hook.f. A seção (*Eu*)*Miconia* foi dividida em sete subseções: *Aplostachyae* Naudin, *Diplostachyae* Naudin*, Impetiolaris* Naudin*, Glomeratiflorae* Naudin*, Stenostachyae* Naudin, *Seriatiflorae* Naudin e *Paniculares* Naudin.

A classificação de Cogniaux (1891) foi baseada naquelas de Triana (1871) e Naudin (1851). Cogniaux (1891) caracterizou a seção *Miconia,* baseado na morfologia dos estames. Segundo a sua chave, as espécies da seção *Miconia* possuem anteras curtas com ápice atenuado, deiscentes através de um ou dois poros. O conectivo do estame é basalmente biauriculado ou biapendiculado na face ventral. A subseção *Seriatiflorae* Naudin até então reunia 31 táxons com inflorescências paniculadas, com ramos bi a trífidos, secundifloros.

Mas foi no trabalho de Naudin (1851) que o grupo informal *Seriatiflorae* foi delimitado na condição de subseção pela primeira vez, tendo como características diagnósticas as panículas piramidais ou alongadas, ramos primários bífidos ou trífidos e ramos secundários ou terciários secundifloros.

O gênero *Miconia* foi historicamente diferenciado dos demais gêneros de Miconieae pelas inflorescências terminais em conjunto com as pétalas obtusas, e pela ausência de outros caracteres distintivos de outros gêneros. Possivelmente, devido à rápida e recente diversificação de *Miconia* juntamente aos altos níveis de homoplasia, foram incluídas nesse gênero diversas espécies que não se encaixaram em nenhum outro gênero da tribo, ou seja por exclusão de caracteres, e não pela não presença deles (Judd e Skean 1991). A complexa história evolutiva do grupo potencializa a dificuldade em delimitar morfologicamente seções monofiléticas dentro de *Miconia,* que, por si só, não representa um grupo natural. Assim, da maneira como tradicionalmente delimitado, *Miconia* é um gênero polifilético (Goldenberg 2008; Caddah 2013). As relações filogenéticas infragenéricas foram testadas pela primeira vez por Goldenberg et al. (2008) com amostragem considerável (cerca de um quarto das espécies do gênero), contemplando todas as seções do gênero, com sequências de duas regiões (ITS- nuclear e ndhF- plastidial). Apesar de não corroborar o monofiletismo de *Miconia* nem de nenhuma

das suas seções, boa parte das espécies brasileiras formaram o chamado clado "*Miconia* IV" (Goldenberg 2008), que reúne espécies predominatemente das seções (*Eu*) *Miconia* e *Glossocentrum*.

Esforços recentes deram início à redelimitação das seções de *Miconia*, visando manter e aceitar apenas grupos monofiléticos. Baseada em filogenia molecular, Caddah (2013) descreveu a nova seção *Discolor* Caddah & R. Goldenb. (Caddah et al. *in prep.*) composta majoritariamente por espécies da antiga seção *Glossocentrum,* com folhas discolores (superfície abaxial com epiderme não visível, densamente recoberta por tricomas ramificados). A maioria dessas espécies ocorre no sudeste do Brasil. Além da seção *Discolor*, quatro subseções são sugeridas no mesmo trabalho: subsect. *Albicans* Caddah & R. Goldenb., subsect. *Chrysophylla* Caddah & R. Goldenb. e subsect. *Multispicata* Caddah & R. Goldenb., além da subseção que dá nome à seção. Ainda que a autora tenha obtido uma boa amostragem das espécies das seções *Glossocentrum/Discolor,* é imprescindível uma maior amostragem dos grupos próximos para a confirmação das características que os distinguem. Assim, torna-se claro que são necessários estudos filogenéticos e taxonômicos mais focados nesses grupos próximos, que permitam a circunscrição mais precisa deles, com a inclusão de muitas espécies ainda não amostradas em seu trabalho.

Dando continuidade ao processo de monografia do gênero megadiverso *Miconia*, os principais objetivos deste estudo foram: a) Testar o monofiletismo da seção *Miconia* subseção *Seriatiflorae*; b) Elucidar o relacionamento entre as espécies da seção *Miconia* subseção *Seriatiflorae*; c) Verificar o quão informativos são os caracteres morfológicos historicamente utilizados na circunscrição da subseção *Seriatiflorae* (ex. tipo de ramificação da inflorescência - panículas com ramos escorpióides); e) Detectar sinapomorfias para grupos internos; f) Avaliar a validade das quatro subseções propostas por Caddah (2013).

2. Métodos

2.1. Amostragem de táxons

Foram amostrados 52 terminais (48 espécies) de *Melastomataceae*, tribo *Miconieae*, com ênfase no gênero *Miconia,* seção *Miconia* subsesct. *Seriatiflorae* (Tabela 1) representando aproximadamente 70% das 27 espécies (31 nomes) inicialmente listadas em Naudin (1850): *Miconia*: 46 terminais; *Leandra*: dois terminais; *Clidemia*: três terminais. *Miconia albicans* (Sw.) Steud., *M. alborufescens* Naudin, *M. serialis* DC. e *M. stenostachya* DC. foram amostradas mais de uma vez, devido à amplitude de ocorrência. Foi também incluída uma espécie ainda não descrita de *Miconia,* para confirmação do posicionamento taxonômico.

Tabela 1. *Vouchers* utilizados na extração de DNA.

Taxon	Seriatiflorae (Cogniaux, 1891)	Clado albicans (Caddah, 2013)	Clado Chrysophylla (Caddah, 2013)	Clado Discolor (Caddah, 2013)	Clado Multispicata (Caddah, 2013)	Voucher	Localidade	Herbários
Clidemia ferox Gleason						J. Meirelles 782	Amazonas,Brasil	INPA, NY, UEC,UPCB
Clidemia ombrophila Gleason						R. Kriebel 5308	-	NY
Clidemia tenebrosa Almeda						D. Penneys 1753	Coclé, Panamá	FLAS, NY
Leandra acutiflora Cogn.						R. Goldenberg 700	Paraná, Brasil	UPCB
Leandra amplexicaulis DC.						R. Goldenberg 723	Paraná, Brasil	UPCB
Miconia albicans (Sw.) Steud.	X	X				E. Becquer 85387	Sancti Spíritus, Cuba	NY
Miconia alborufescens Naudin		X				J. Meirelles 859	Pará, Brasil	NY, UPCB
Miconia argyrophylla DC.	X	X				S. Renner 125	-	-
Miconia argyrophylla ssp. gracilis Wurdack						J. Meirelles 863	Pará, Brasil	INPA, NY, UEC,UPCB
Miconia chrysophylla (Rich.) Urb.			X			L. Kelly 1366	Mexico	NY
Miconia cinerascens var. cinerascens Miq.				X		R. Goldenberg 730	Paraná, Brasil	MBM, NY, UPCB
Miconia cinerascens var. robusta Wurdack				X		R. Goldenberg 782	São Paulo, Brasil	MBM, NY, UPCB
Miconia cinerea Cogn.	X					A. Uhlmann 462	Rio de Janeiro, Brasil	UPCB
Miconia cinnamomifolia (DC.) Naudin						R. Goldenberg 754	Paraná, Brasil	UPCB
Miconia discolor DC.	X			X		R. Goldenberg 749	Paraná, Brasil	MBM, NY, UPCB
Miconia díspar Benth.	X		X			R. Goldenberg 967	Acre, Brasil	NY, UPCB
Miconia eriodonta DC.	X				X	M.K. Caddah 595	Amazonas, Brasil	NY, UPCB
Miconia fallax DC.	X					M.K. Caddah 411	Minas Gerais, Brasil	NY, UPCB
Miconia ferruginata DC.	X		X			R. Goldenberg 1480	Goiás, Brasil	NY, UPCB
Miconia formosa Cogn.				X		M.K. Caddah & J. Meirelles 718	Rio de Janeiro, Brasil	NY, UEC, UPCB
Miconia heliotropoides Triana	X					R. Goldenberg 1486	Goiás, Brasil	UPCB
Miconia hypoleuca (Benth.) Triana		X				R. Goldenberg 833	Bahia, Brasil	CEPEC, HUEFS, MBML, RB, UPCB
Miconia latecrenata (DC.) Naudin						R. Goldenberg 710	Paraná, Brasil	NY, UPCB
Miconia lepidota DC.	X				X	L. Kollman 8556	Espiríto Santo, Brasil	MBML,UPCB
Miconia longispicata Triana			X			F. A. Michelangeli 448	Amazonas,Venezuela	NY
cf. *Miconia lourteigiana* Wurdack *estéril		X				R. Goldenberg 1408	Acre, Brasil	NY, RB
Miconia macrothyrsa Benth.	X					P. Labiak 5040	Minas Gerais, Brasil	NY, UPCB
Miconia macuxi sp. nov.						R. Goldenberg 1594	Roraima, Brasil	UPCB

Miconia minutiflora (Bonpl.) DC.					R. Goldenberg 759	São Paulo, Brasil	MBM, NY, UPCB
Miconia multispicata Naudin				X	F. A. Michelangeli 812	Portuguesa, Venezuela	NY
Miconia navioensis Wurdack					J. Meirelles 900	Pará, Brasil	UPCB, NY
Miconia octopetala Cogn.			X		L. Kollmann 8560	Espírito Santo, Brasil	MBML, UPCB
Miconia penduliflora Cogn.			X		R. Goldenberg 1536	Rio de Janeiro, Brasil	BHCB, NY, RB, UEC, UPCB
Miconia petroniana Cogn. & Saldanha			X		M.K. Caddah & J. Meirelles 767	Rio de Janeiro, Brasil	UPCB
Miconia polyandra Gardner	X			X	L. Kollman 8577	Espirito Santo, Brasil	MBML
Miconia pterocaulon Triana	X				R. Goldenberg 971	Acre, Brasil	LABEV, MO, NY,RB, UPCB
Miconia punctata (Desr.) D. Don	X				S. Klimas s/n	Heredia, Costa Rica	NY
Miconia punctata (Desr.) D. Don	X				J. Meirelles 719	Amazonas, Brasil	INPA,UEC,UPCB,NY
Miconia rufescens (Aubl.) DC.		X			F. A. Michelangeli 824	Cojedes, Venezuela	NY
Miconia ruficalyx Gleason				X	M. K. Caddah 802	Bahia, Brasil	UEC, UPCB
Miconia secundiflora Cogn.	X				J. Meirelles 858	Pará, Brasil	UPCB, NY
Miconia serialis DC.	X				J. Meirelles 891	Pará, Brasil	UPCB, NY
Miconia serialis DC.	X				J. Meirelles 749	Roraima, Brasil	INPA,UEC,UPCB,NY
Miconia stenostachya DC.	X				H. David 3266	Antioquia, Colombia	NY
Miconia stenostachya DC.	X				F. Michelangeli 809	Portuguesa, Venezuela	NY
Miconia suberosa Meirelles & R. Goldenb.					J. Meirelles 785	Amazonas, Brasil	INPA,UEC,UPCB,NY
Miconia tiliifolia Naudin	X				C. R. Boelter 440	Rondônia, Brasil	UPCB, NY
Miconia valtheri Naudin				X	R. Goldenberg 718	Paraná, Brasil	UPCB
Physeterostemon fiaschii R.Goldenb. & Amorim					A. Amorim 4515	Bahia, Brasil	CEPEC, NY, UPCB

2.2. Extração de DNA, PCR, sequenciamento, edição de sequências e alinhamento

O DNA total das amostras foi isolado de folhas desidradatadas em sílica gel ou de material de herbário com o kit DNAeasy da Qiagen (Qiagen, Hilden, Alemanha), seguindo o protocolo do fabricante. Todos os *primers* utilizados para os marcadores seguiram Kriebel et al. 2015 e são citados na Tabela 2.

Amplificações foram realizadas com reações de PCR (reação em cadeia da polimerase) com um volume total de 15 µl composto dos seguintes componentes: 0.7 µl de DNA, 7.5 µl de GreenTaq, 2 µl de cada *primer* específico de cada região (1 mmol de cada *primer*, *forward* e *reverse*), 0.75 µl de espermidina e 2.05 µl de água. As reações foram feitas para cada região estudada, de acordo com os protocolos de Michelangeli et al. (2004) e Kriebel et al. (2015):

*acc*D-*psa*L: 94°C por dois min; 40 ciclos de 94°C, por 30 seg., 57°C por 30 seg. e 72°C por 75 seg.; 72°C por 7 min.;

a*tp*F-*atp*H: 94°C por dois min.; 40 ciclos de 94°C, por 45 seg., 57°C por 60 seg. e 72°C por 60 seg.; 72°C por 7 min.;

nrETS: 94°C por dois min.; 40 ciclos de 94°C, por 30 seg., 55°C por 37 seg. e 72°C por 40seg; 72°C por 7 min;

nrITS: 94°C por dois min.; 40 ciclos de 94°C, por 30 seg., 52°C por 30 seg. e 72°C por 40 seg; 72° C por 7 min.;

*psb*K-*psb*L: 94°C por dois min.; 40 ciclos de 94°C, por 30 seg., 53°C por 30 seg. e 72°C por 30 seg.; 72°C por 7 min.;

*trn*S-*trn*G: 94°C por dois min.; 40 ciclos de 94°C, por 45 seg., 57°C por 45 seg., 72°C por 60 seg.; 72°C por 7 min.

O material amplificado foi ciclo sequenciado com os mesmos *primers* utilizados na amplificação através do serviço de sequenciamento "*high-througtput*" da Universidade de Washington. Os fragmentos das sequências foram editados com o programa Sequencher v. 4.9 (GeneCode Corp., Ann Arbor, Michigan, EUA) e foram feitos projetos, reunindo todas as sequências para cada região. Posteriormente, as sequências foram alinhadas com

a ferramenta Muscle v3.6 (Edgar 2004), no programa MEGA 6.0 (Tamura et al. 2013), e pequenos ajustes manuais foram feitos no programa Bioedit (Hall 2007). As regiões foram concatenadas no programa Mesquite v. 3.03 (Maddison e Maddison 2011).

Tabela 2. Regiões do DNA associadas com os *primers* usados neste estudo (adaptada de Kriebel *et al.* 2015).

Região	Primers	Referência
accD- psaL	5'-GCA GGT AAA AGA GTA ATT GAA CAA-3'	Shaw et al. (2007)
	5'-AGA AGC CAT TGC AAT TGC CGG AAA-3'	
atpF- atpH	5'-ACT CGC ACA CAC TCC CTT TCC-3'	Kim *in* Reginato *et al.* (2010)
	5'-GCTTTTATGGAAGCTTTAACAAT-3'	
ETS	5'-ACG TGT CGC GTC TAG CAG GCT-3'	Nicholas e Michelangeli *in prep.*
	5'-AGA CAA GCA TAT GAC TAC TGG CAG G-3'	
ITS	5'-CCT TAT CAT TTA GAG GAA GGA G-3'	Wurdack from Standfor *et al.* (2000).
	5'-ATT GAT GGT TCG CGG GAT TCT GC-3'	Michelangeli *et al.* (2004).
	5'-GCA TCG ATG AAG AAC GCA GC-3'	White *et al.* (1990).
	5'-CAG TGC CTC GTG GTG CGA CA-3'	Wurdack in Michelangeli *et al.* (2004).
psbK -psbL	5'-TTA GCC TTT GTT TGG CAA G-3'	Reginato et al. (2010)
	5'-AGA GTT TGA GAG TAA GCA T-3'	
trnS-trnG	5'-GAA CGA ATC ACA CTT TTA CCA C-3'	Shaw et al. (2007)
	5'-GCC GCT TTA GTC CAC TCA GC-3'	

2.3. Análises filogenéticas

Foram analisados os seguintes conjuntos de dados: plastidial (quatro regiões concatenadas); nuclear (duas regiões) e total (seis regiões), aplicados a dois tipos de análises filogenéticas: análise de Máxima Parcimônia (MP) e de Inferência Bayesiana (IB).

As análises de Máxima Parcimônia (MP) foram rodadas no programa NONA (Goloboff 1999) em Winclada (Nixon 2002). Buscas heurísticas foram realizadas com os seguintes parâmetros: máximo de 100000 árvores retidas; 500 replicações; três árvores iniciadoras por replicação e estratégia de busca: multiple TBR+TBR (multi*max). Das

árvores resultantes, foi obtida uma árvore de consenso estrito onde foram indicados os valores de suporte obtidos por análise de *bootstrap* (Felsenstein 1985), rodada no mesmo programa com os seguintes parâmetros: 1000 replicações; 10 buscas por replicata (mult.*N); e cinco árvores iniciadoras por replicação.

Para encontrar o modelo evolutivo (modelo de substituições de base) mais apropriado para cada região estudada, foi empregada a função *JModeltest* (Posada 2008), baseada nos menores valores de *Akaike Information Criterion* (AIC, Akaike 1974), no programa MEGA 6.0 (Tamura et al. 2013).

As análises de Inferência Bayesiana (IB) foram feitas pelo conjunto de programas de reconstrução filogenética e datação molecular associados ao *BEAST* v.1.8.1 (Bouckaert et al. 2014): *Beauti* v.1.8.1 (Drummond et al. 2014), *Tree Anotator* v.1.8.1 (Rambaut e Drummond 2014) e *Fig Tree* V.1.4.2 (Rambaut 2006-2014). Os parâmetros foram estabelecidos no programa Beauti, como listados a seguir: modelos de substituição independentes entre as regiões ("*unlink sustitution models*"); grupo externo indicado: *Clidemia ferox*; tipo de relógio: "*lognormal relaxed clock*"; *tree Prior*: especiação pelo processo de Yule (Gernhard 2008); ucld.mean: exponencial, valor inicial 1.0, média 12.0 (data de divergência de *Clidemia* segundo Reginato, 2014) e desvio padrão de 1.0. Cadeias de Markov e Monte Carlo (MCMC) foram rodadas com comprimento de cadeia de dez milhões, e registro de parâmetros a cada 1000 replicações. A sustentação dos ramos foi estimada, utilizando-se as probalilidades posteriores (Ronquist e Huelsenbeck 2003).

2.4. Reconstrução de estados de caráter morfológicos

Adicionalmente aos dados moleculares, foram analisados quarenta caracteres morfológicos, que já haviam sido explorados por Caddah (2013), sendo vinte e sete binários e treze multi-estados (Tabela 3). A obtenção das características para a matriz foi feita com a análise de materiais em campo, em herbários nacionais e estrangeiros (BR, G, G-DC, HUEFS, IAN, INPA, JOI, K, M, MBM, MG, NY, P, RB, UEC, UPCB, US, W) e descrições publicadas em obras *princeps* ou trabalhos de revisão taxonômica (ex.

Goldenberg 2000, Caddah 2013, Meirelles in prep.,). Cada caráter foi otimizado sobre a árvore de consenso de maioria gerada pela análise bayesiana para identificação das possíveis sinapomorfias, utilizando o programa Mesquite v. 3.03 (Maddison e Maddison 2011).

Para a análise detalhada do indumento e superfície das sementes, foram realizados procedimentos de microscopia eletrônica de varredura. Fragmentos de folhas de materiais de herbário com cerca de 1 cm^2 foram fixados sobre fita de cobre adesiva dupla face (Electron Microscopy Science), sobre suportes de alumínio (*stubs*) com a superfície abaxial virada para cima. Os *stubs* foram devidamente numerados e, posteriormente, os materiais foram revestidos com *gold palladium* no metalizador Hummer 62 *sputter coater* (Anatech, Springfield, VA), analisados e fotografados em microscópio de varredura modelo Jeol JSM-5410 LV, operado a 10 kV no laboratório de Sistemática molecular do *New York Botanical Garden* (NYBG). As sementes desidratadas foram extraídas de frutos amadurecidos em materiais de herbário e limpas dos fragmentos de placenta. Foram selecionadas sementes íntegras, que foram posicionadas nos suportes de modo a facilitar a visualização da superfície nas faces dorsal, lateral e ventral. Sempre que possível, as sementes foram retiradas do mesmo *voucher* do qual se extraíram os fragmentos de folhas, seguindo o mesmo método de Ocampo e Almeda (2013). Para análise das partes florais, as flores foram extraídas de materiais de herbário e fervidas em 100 ml de água com uma gota de detergente de cozinha, por cerca de um minuto, em forno microondas. Todas as partes foram medidas com auxílio de paquímetro digital e fotografadas com auxílio de microscópio estereoscópico para a confecção de pranchas comparativas.

Tabela 3. Lista de caracteres morfológicos e estados de caráter analisados adaptada de Caddah (2013).

1. Forma de crescimento: arbusto=0, árvore ou arvoreta=1.
2. Indumento dos ramos: epiderme visível=0, epiderme não visível=1.
3. Linhas nos ramos: ausentes=0, presentes=1.
4. Comprimento dos pecíolos: <4,5mm=0, 6-14mm=1, 16-37mm=2, >40mm=3.
5. Indumento na superfície abaxial das folhas: epiderme visível=0, epiderme não visível=1.

6. Tricomas da superfície abaxial das folhas: simples=0, ramificados=1.
7. Tipo de tricoma ramificado: estrelado=0; dendrítico=1, aracnóide=2.
8. Cor do indumento: cinéreo=0; ferrugíneo=1, amarelado=2.
9. Número de veias principais: 3 ou 3+2=0, 5 ou 5+2=1.
10. Venação: basal=0, suprabasal=1.
11. Textura da lâmina: membranácea=0, cartácea=1.
12. Base da lâmina: aguda ou decorrente=0, arredondada ou cordada=1.
13. Margem da lâmina: inteira=0, crenulada a serreada=1.
14. Cílios nas margens da lâmina: ausentes=0, presentes=1.
15. Domácias: ausentes=0, presentes=1.
16. Ramos acessórios nas inflorescências: ausentes=0, presentes=1.
17. Comprimento das inflorescências: <8mm=0, 18-150mm=1, 153-184mm=2; >225mm=3.
18. Flores nos ramos distais: dicasiais=0, glomeruladas=1, escorpióides=2.
19. Forma do hipanto: semi-elíptico a campanulado=0, oblongo=1.
20. Comprimento do hipanto: <1.7mm=0, 1.8-2.4mm=1, 2.6-3=2, >3.6=3.
21. Merosidade: 4=0, 5=1, 6 ou +=3.
22. Ápices das pétalas: emarginado=0, arredondado a truncado=1, agudo=2.
23. Comprimento das pétalas: <1.8mm=0, 1.8-2.4mm=1, 2.6-3mm=2, >3.6mm=3.
24. Pétalas glandulares cilioladas: ausentes=0, presentes=1.
25. Dente do cálice: ausente=0, presente=1.
26. Forma dos lobos internos do cálice: truncada=0, triangular=1.
27. Deiscência do cálice: persistente=0, caduco=1.
28. Tamanho dos estames: isomórficos=0, dimórficos=1.
29. Forma das anteras: lineares=0, encurvadas=1, reflexas=2.
30. Deiscência das anteras: poricida=0, rimosa=1.
31. Posição do poro da antera: ventral=0, terminal=1, dorsal=2.
32. Cor das anteras: branca=0, amarela=1.
33. Prolongamento do conectivo: ausente=0, presente=1.
34. Lobos no conectivo: ausentes=0, presentes=1.
35. Glândulas no conectivo: ausentes=0, presentes=1.
36. Tricomas na região do tórus: ausentes=0, presentes=1.
37. Forma do estigma: truncada=0, capitada=1, punctiforme=2.
38. Posição do ovário: ínfero ou parcialmente ínfero=0, súpero=1.
39. Indumento no ápice do ovário: ausente=0, presente=1.
40. Superfície da semente: lisa=0, ornamentada=1.

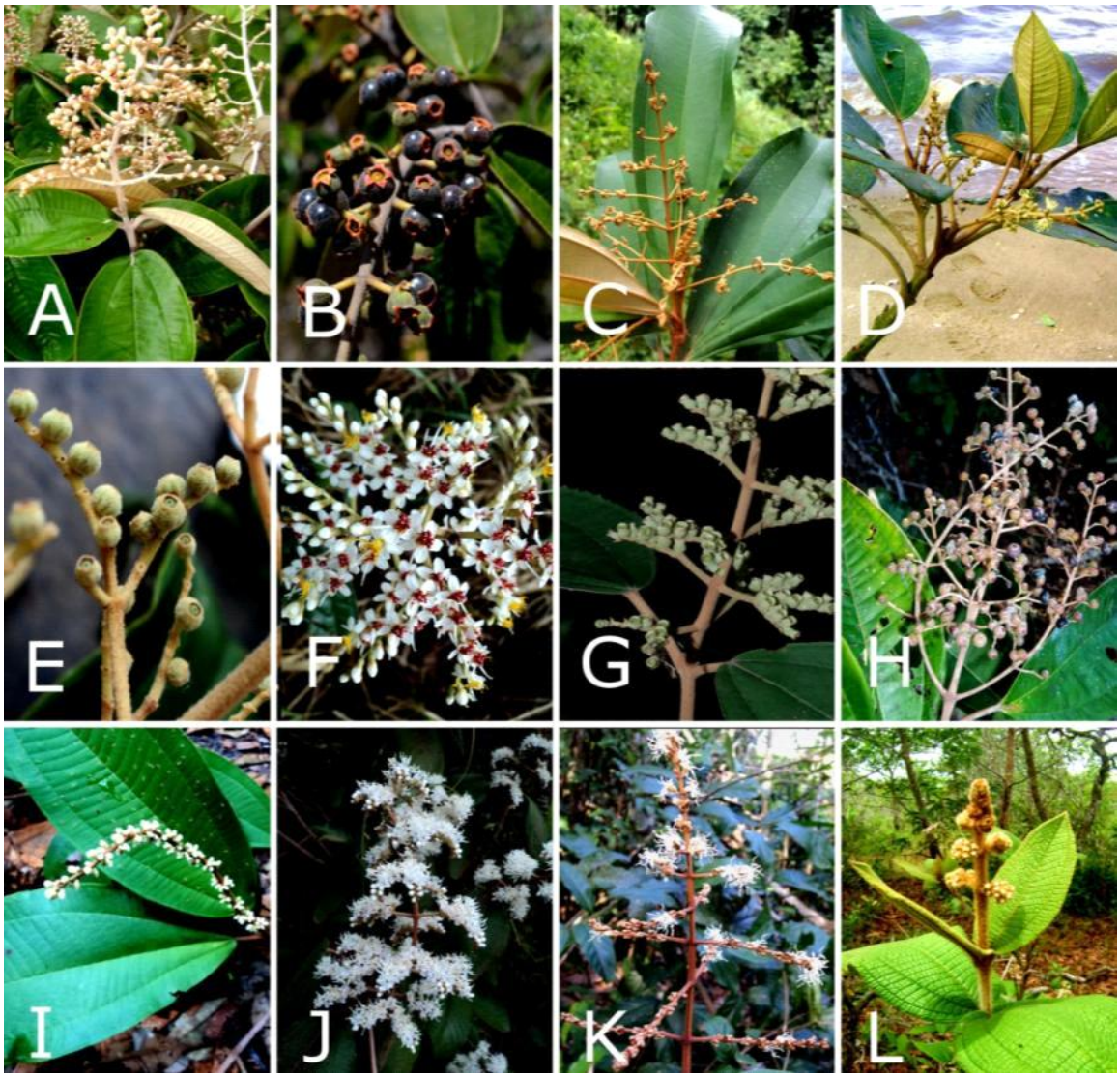

Fig. 1. Ramos férteis de algumas das espécies amostradas neste estudo. A. *M. albicans*. B. *M. astrocalyx* sp. nov. C. *M. chrysophylla.* D. *M. formosa.* E. *M. dispar* (detalhe do ramo secundo). F. *M. fallax* (foto: C. Snak). G. *M. heliotropoides* (foto: R. Goldenberg). H. *M. lepidota*. I. *M. longispicata*. J. *M. macrothyrsa*. (foto: C. Snak). K. *M. punctata*. L. *M. rufescens*.

3. Resultados

3.1. Análises filogenéticas

Os dados nucleares apresentaram maior porcentagem de pares de bases informativos (Tabela 4), topologias melhor resolvidas e valores de suporte mais altos que os resultados advindos de dados plastidiais.

Tanto nas topologias resultantes das análises isoladas das regiões nucleares e plastidiais, como na total (matriz combinada núcleo + plastídeo) de MP e IB, a subseção *Seriatiflorae* sensu Naudin (1851) é polifilética, incluindo espécies de outras subseções dentro da seção *Miconia*: *Aplostachyae* (ex. *M. longispicata*), *Glomeratiflorae* (*M. rufescens*) e também de outras seções, como *Glossocentrum* (ex. *M. alborufescens*) e *Chaenanthera* (ex. *M. chrysophylla* e *M. hypoleuca*). As espécies inicialmente incluídas em *Seriatiflorae* por Naudin distribuem-se em quatro principais clados bem sustentados que se repetem em todas as análises: clado *Albicans*, clado *Chrysophylla,* clado *Discolor* e clado *Multispicata* (nomes dos clados atribuídos em Caddah 20013).

Tabela 4. Dados sobre as regiões sequenciadas neste estudo. O número de pares de bases das sequências alinhadas inclui os "*gaps*".

Tipo de dado	Nº de terminais	Nº. de pares de bases	Nº. de pares de bases informativos (%)	Modelo evolutivo selecionado
accD-psaL	50	741	22 (2%)	GTR+G
atpF-atpH	51	761	16 (1%)	T92+G
ETS	52	614	143 (23%)	HKY+G
ITS	52	976	88 (9%)	T92+G
psbK-psbL	52	408	8 (1%)	HKY
trnS-trnG	52	931	55 (5%)	T92+G
Nuclear combinada	52	1590	231 (14%)	-
CpDNA combinada	52	2841	96 (3%)	-
Total seis regiões	52	4431	327 (7%)	-

3.1.1. Dados do cloroplasto

A análise de MP com as quatro regiões plastidiais concatenadas não obteve resolução para o esqueleto da topologia da árvore de consenso estrito (Fig. 2).

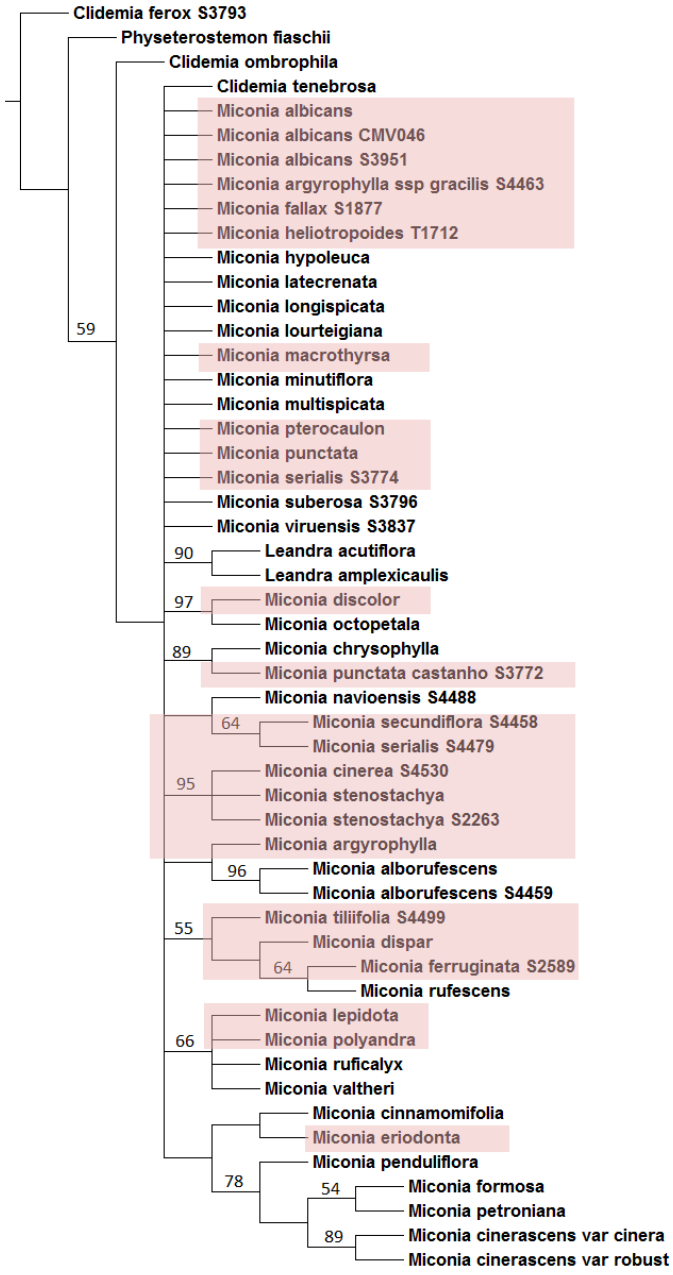

Fig. 2. Árvore consenso estrito resultante da análise de MP com dados de quatro regiões plastidiais combinadas. As espécies sombreadas representam a antiga subseção *Seriatiflorae*.

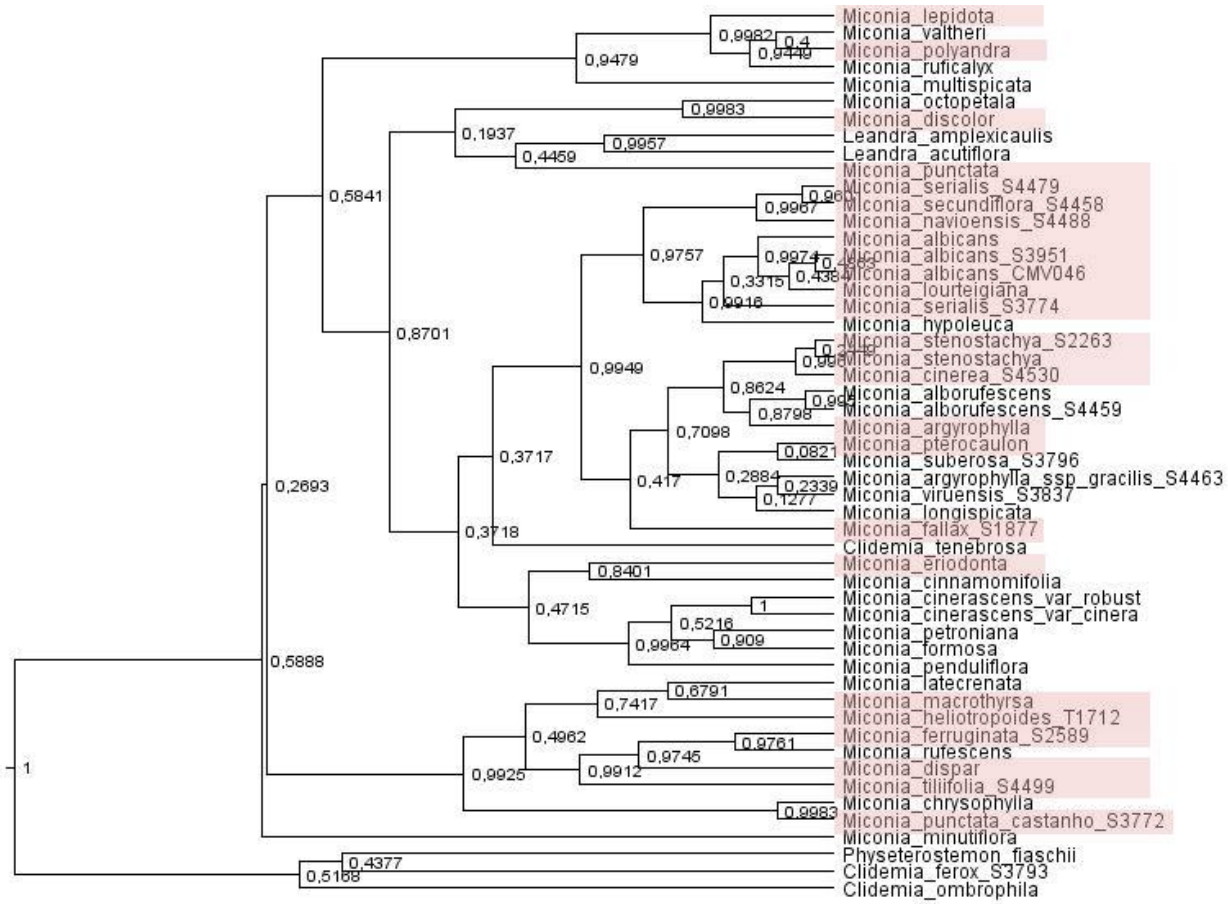

Fig. 3. Árvore da análise de IB com os dados de quatro regiões plastidiais combinadas. As espécies sombreadas representam a antiga subseção *Seriatiflorae*.

A análise de IB com os dados plastidiais combinados apresentou melhores resultados com alguns clados bem sustendados: clados *Multispicata*, *Albicans, Discolor e Chrysophylla*. Entretanto a relação entre os clados não possui suporte satisfatório.

O clado *Multispicata* (PP=0,9479) reúne as espécies *M. lepidota*, *M. valtheri*, *M. polyandra*, *M. ruficalyx* e *M. mustispicata*.

O clado *Albicans* (PP=0,9949) é composto por dois subclados distintos: o primeiro bem sustentado (PP=0,9757) com as espécies *M. serialis*, *M. secundiflora*, *M. navioensis*, *M. albicans*, *M. lourteigiana* e *M. hypoleuca*; o segundo (PP=0,417) não possui suporte e reuniria as espécies mais próximas a *M. fallax* e *M. stenostachya*.

3.1.2. Dados nucleares

A análise de MP com os dados nucleares combinados (Fig. 4) gerou alguns clados bem sustentados. O clado Miconia (BS=98), Multispicata (BS=87), Discolor (BS=85), Fallax (BS=99), Chrysophylla (BS=76), Albicans (BS=92).

As análises de IB com as duas regiões nucleares (nrETS e nrITS) combinadas (Fig. 5) demonstram que o clado com todas as espécies de *Miconia* é sustentado (PP=0,9936). As espécies de *Miconia* glabrescentes (*M. minutiflora* + *M. cinnamomifolia* + *M. latecrenata*) também formam um grupo bem sustentado (PP=0,9905).

Além destes, outros clados também são sustentados: clado Multispicata (PP=0.9954); clado Discolor (PP= 0,9943); clado Chrysophylla (PP=0,9912); clado Fallax (PP=0,9992) e clado Albicans (PP=0,9918).

O clado Multispicata (PP=0,9975) é grupo irmão de todas as outras espécies de *Miconia* com folhas discolores, sendo composto por seis espécies (*M. eriodonta*, *M. lepidota*, *M. multispicata*, *M. polyandra*, *M. ruficalyx* e *M. valtheri*).

Miconia heliotropoides e *M. macrothyrsa* formam um clado (PP=1) que se repete em todas as análises, variando o seu posicionamento. Na anállise de IB com dados nucleares ficou posicionado como irmão do grupo de clados *Discolor* + *Chrysophylla* + *Fallax* + *Albicans.*

O clado Discolor (PP=0,9943) é composto por *M. cinerascens* var. *cinerascens* e var. *robusta*, *M. discolor*, *M. formosa*, *M. octopetala*, *M. penduliflora* e *M. petroniana*.

O clado Chrysophylla (PP=0,9912) inclui dois subclados irmãos: o primeiro (PP=0,9848) composto por *M. suberosa* e *M. longispicata*. O segundo (PP=0,9975) por por *M. chrysophylla*, *M. punctata*, *M. punctata*, *M. rufescens* e *M. tiliifolia*.

Miconia dispar forma um pequeno clado (PP=0,9917) junto com *M. ferruginata,* que se repete em todas as análises. Nesta análise, posiciona-se como irmão do clado *Chrysophylla.*

O subclado *Fallax* (PP=0,9992) inclui *M. argyrophylla*, *M. argyrophylla* ssp. *gracilis*, *M. cinerea*, *M. fallax*, *M. pterocaulon*, *M. stenostachya* e *M. viruensis (M. macuxi)*.

O subclado *Albicans* (PP=0,9918) inclui as espécies *M. albicans*, *M. alborufescens*, *M. hypoleuca*, *M. lourteigiana*, *M. navioensis*, *M. secundiflora* e *M. serialis*.

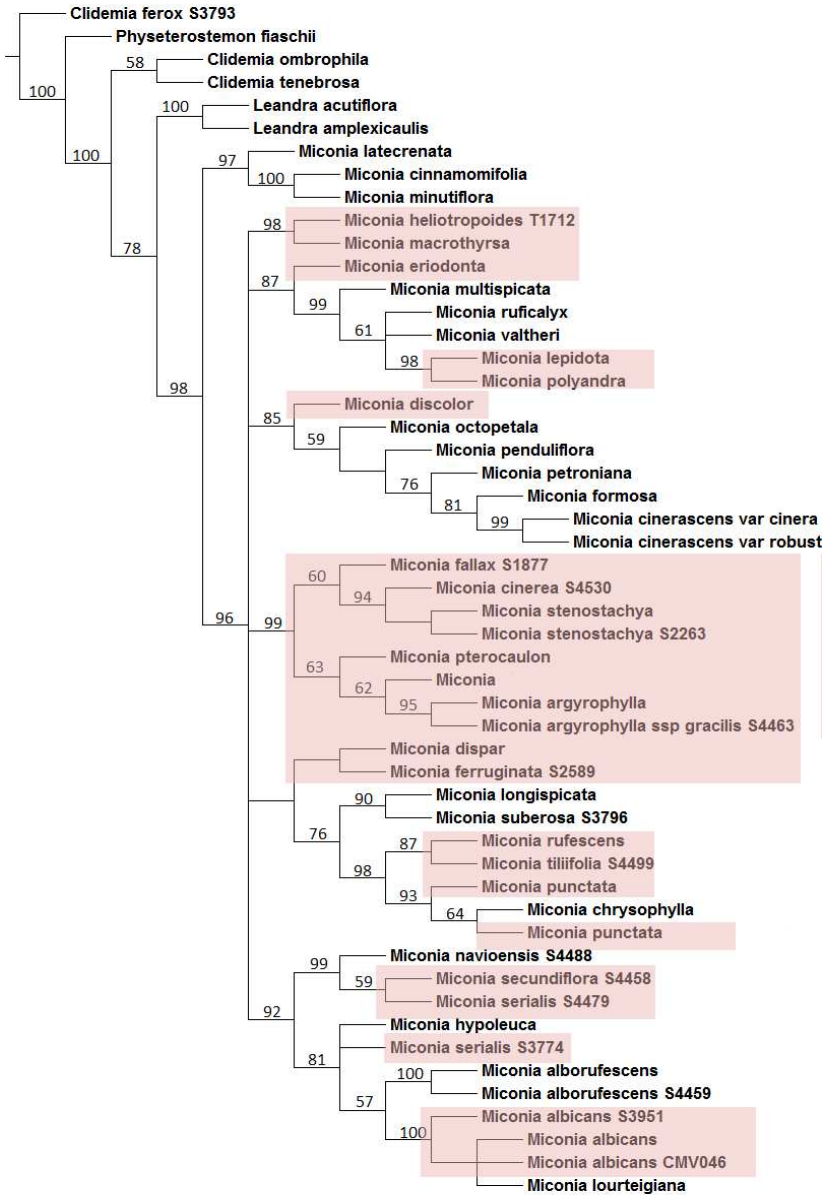

Fig. 4. Árvore de consenso estrito resultante de análise de MP com duas regiões nucleares combinadas. As espécies sombreadas correspondem à antiga subseção *Seriatiflorae*.

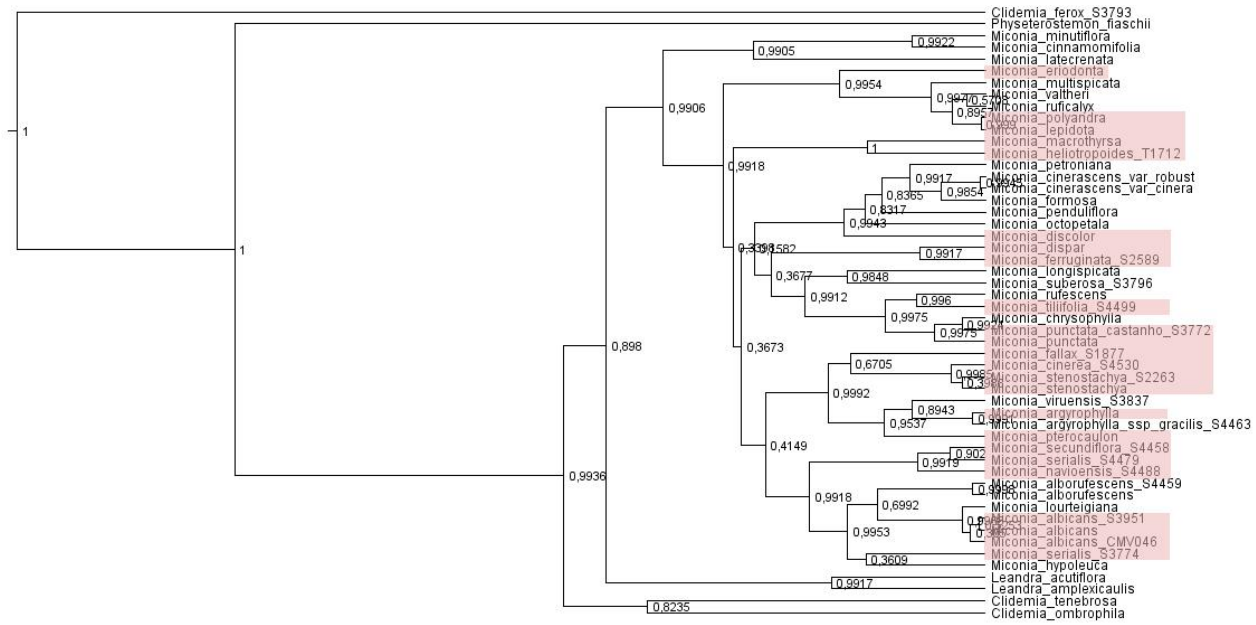

Fig. 5. Análise de IB com dados das regiões nucleares combinadas. As espécies sombreadas correspondem à antiga subseção *Seriatiflorae*.

3.1.3. Dados combinados

As topologias das árvores de MP (Fig. 6) e IB (Fig. 7) geradas com todos os dados concatenados são altamente congruentes, com exceção do posicionamento do clado Chrysophylla.

Em todas as análises combinadas (MP e IB), o clado albicans é sempre subdividido em três subclados bem sustentados. O primeiro subclado é formado por *M. suberosa* e *M. longispicata* irmão de um clado maior não sustentado nas análises de MP e IB. Este clado maior é composto por dois subclados que sempre possuem altos valores de sustentação: o subclado albicans e o subclado Fallax (ambos com sete espécies cada). O segundo subclado reúne as espécies mais próximas a *Miconia albicans*: *M. albicans* (3 terminais), *M. alborufescens* (2 terminais), *M. hypoleuca*, *M. lourteigiana*, *M. navioensis*, *M. secundiflora* e *M. serialis* (2 terminais). O terceiro subclado é o de *Miconia fallax*, composto por *M. argyrophylla*, *M. argyrophylla* subsp. *gracilis*, *M. cinerea*, *M. fallax* e *M. pterocaulon*, *M. stenostachya* (2 terminais) e *M. macuxi*.

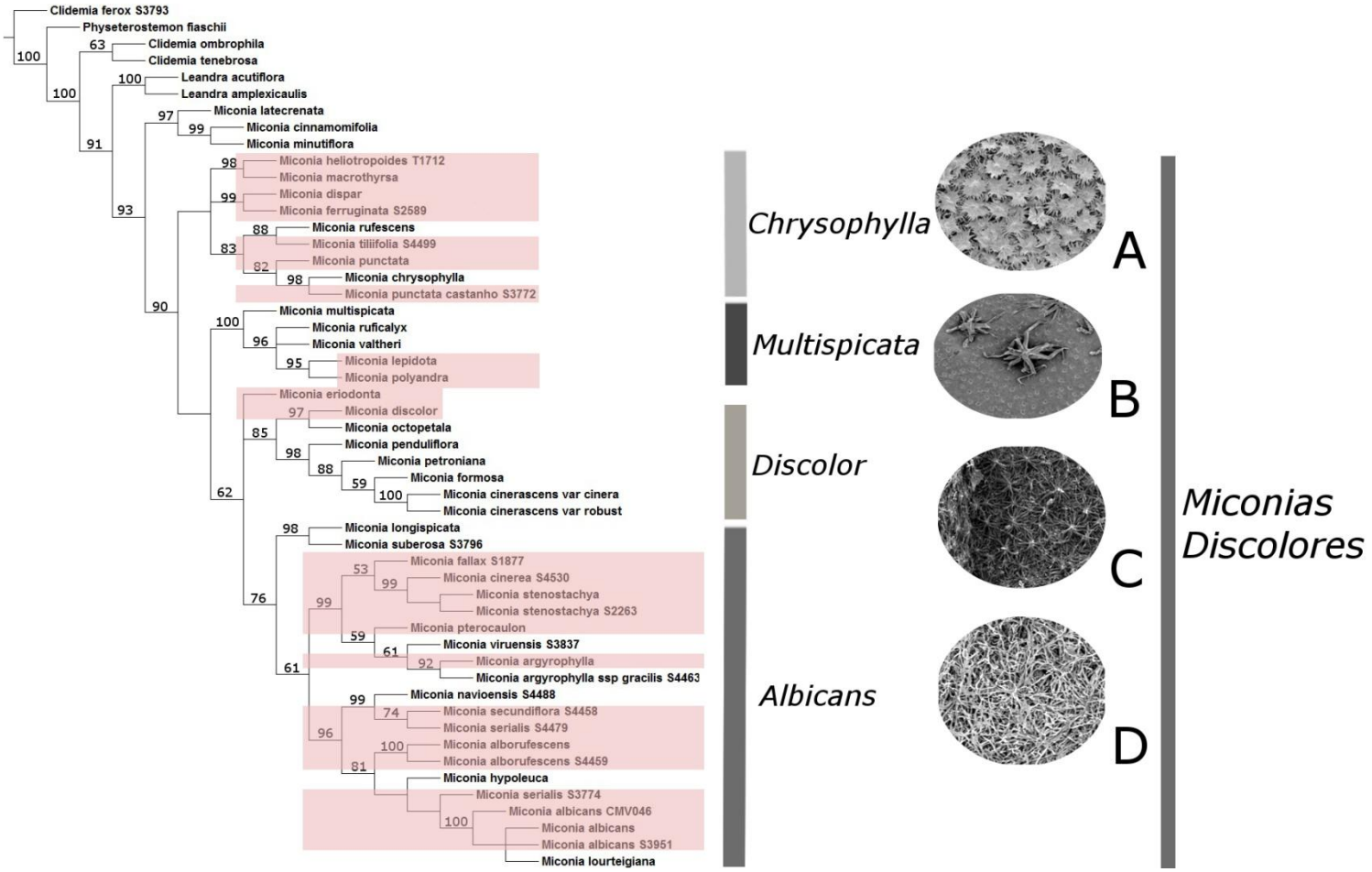

Fig. 6. Árvore de consenso estrito da análise de máxima parcimônia, com todas as regiões concatenadas. Os números acima dos ramos são valores de suporte de *bootstrap*. As espécies da seção *Discolor* (Caddah 2013) distribuem-se entre os clados com nomes indicados nas barras à direita. As imagens à direita correspondem ao tipo de tricoma do indumento da superfície abaxial das folhas: A. Lepidoto. B. Estrelados esparsos. C. Estrelados densos. D. Amorfos ou aracnoides.

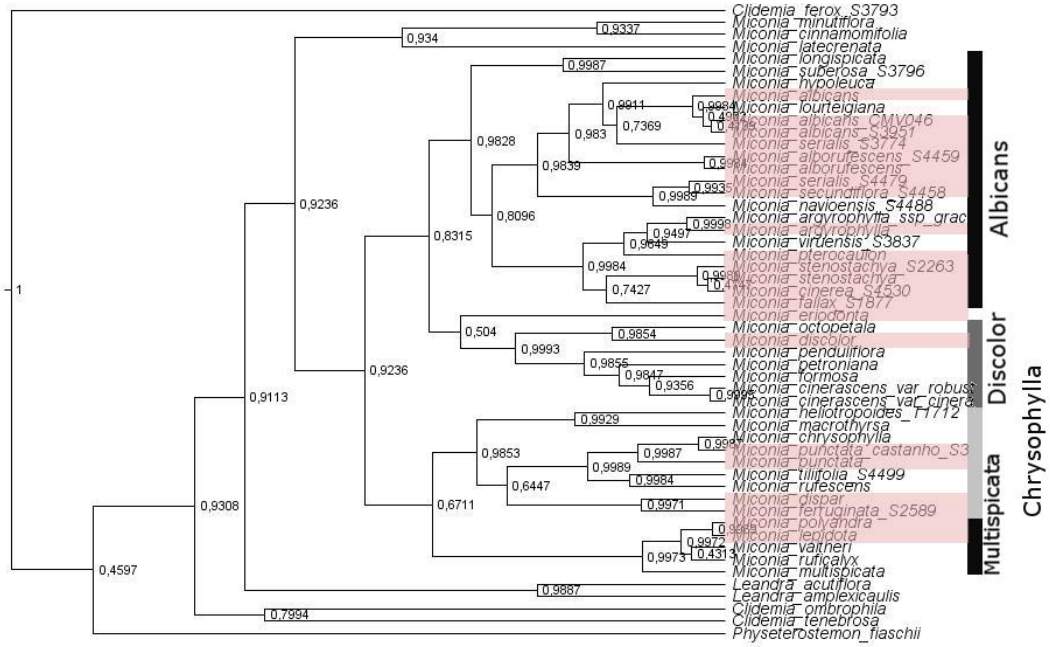

Fig. 7. Árvore resultante de IB com todas as regiões combinadas. Números em frente aos nós correspondem aos valores das probabilidades posteriores. *Miconia* (PP=0,9236); clado *Multispicata* (PP=?); clado *Chrysophylla* (PP=0,9853); clado *Discolor* (PP=0,9993 excluindo *M. eriodonta*); clado A*lbicans* (PP=0,9828); subclado *Suberosa* (PP=0,9987); subclado *Albicans* s.s. (PP=0,9839); subclado *Fallax* (PP=0,9884).

2.6. Reconstrução de caracteres morfológicos

Os caracteres mais importantes no reconhecimento dos clados foram: a)tipo de tricoma ramificado (Fig. 8, lado esquerdo). O estado amorfo é uma sinampomorfia do clado A*lbicans*. b) textura da lâmina (Fig. 8, lado direito). As folhas cartáceas representam uma sinapomorfia do subclado A*lbicans.* c) flores nos ramos distais das inflorescências (Fig. 9, lado esquerdo). As inflorescências com ramos escorpioides surgiram uma única vez e ocorrem em diversas espécies externas à subseção *Seriatiflorae*. Essa condição passou por uma reversão para inflorescências com ramos glomerulados no clado *Discolor*. d) pétalas glandular-cilioladas (Fig. 9, lado direito). O estado presente é uma sinapomorfia do clado *Fallax.*

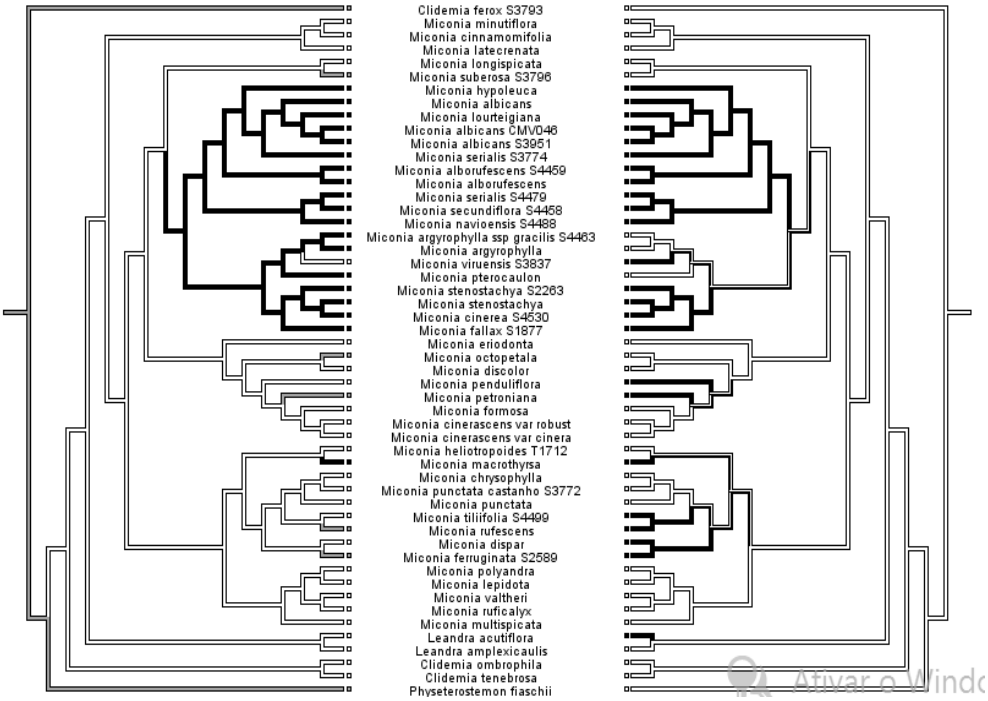

Fig. 8. Otimização dos caracteres morfológicos sobre a árvore de consenso de maioria da análise de IB com todas as regiões combinadas. Lado esquerdo: Tipo de tricoma ramificado (branco: estrelado; cinza: dendrítico; preto: amorfo). Lado direito: Textura da lâmina (branco: membranácea; preto: cartácea).

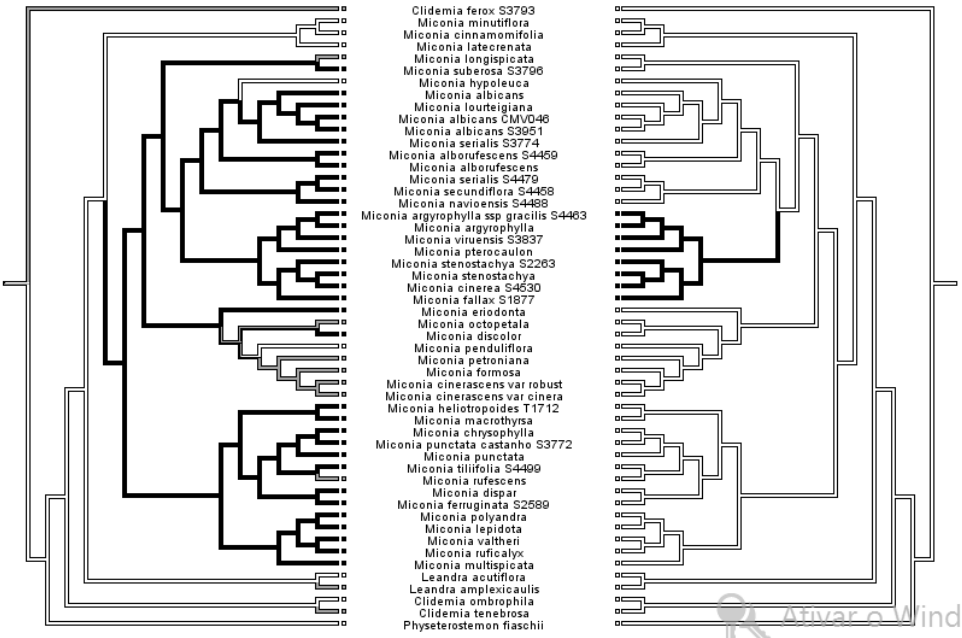

Fig. 9. Otimização dos caracteres morfológicos sobre a árvore de consenso de maioria da análise de IB com todas as regiões combinadas. Lado esquerdo: Flores nos ramos distais das inflorescências (branco: dicasiais; cinza: glomeruladas; preto: escorpioides). Lado direito: Pétalas glandulares cilioladas (branco: ausentes; preto: presente).

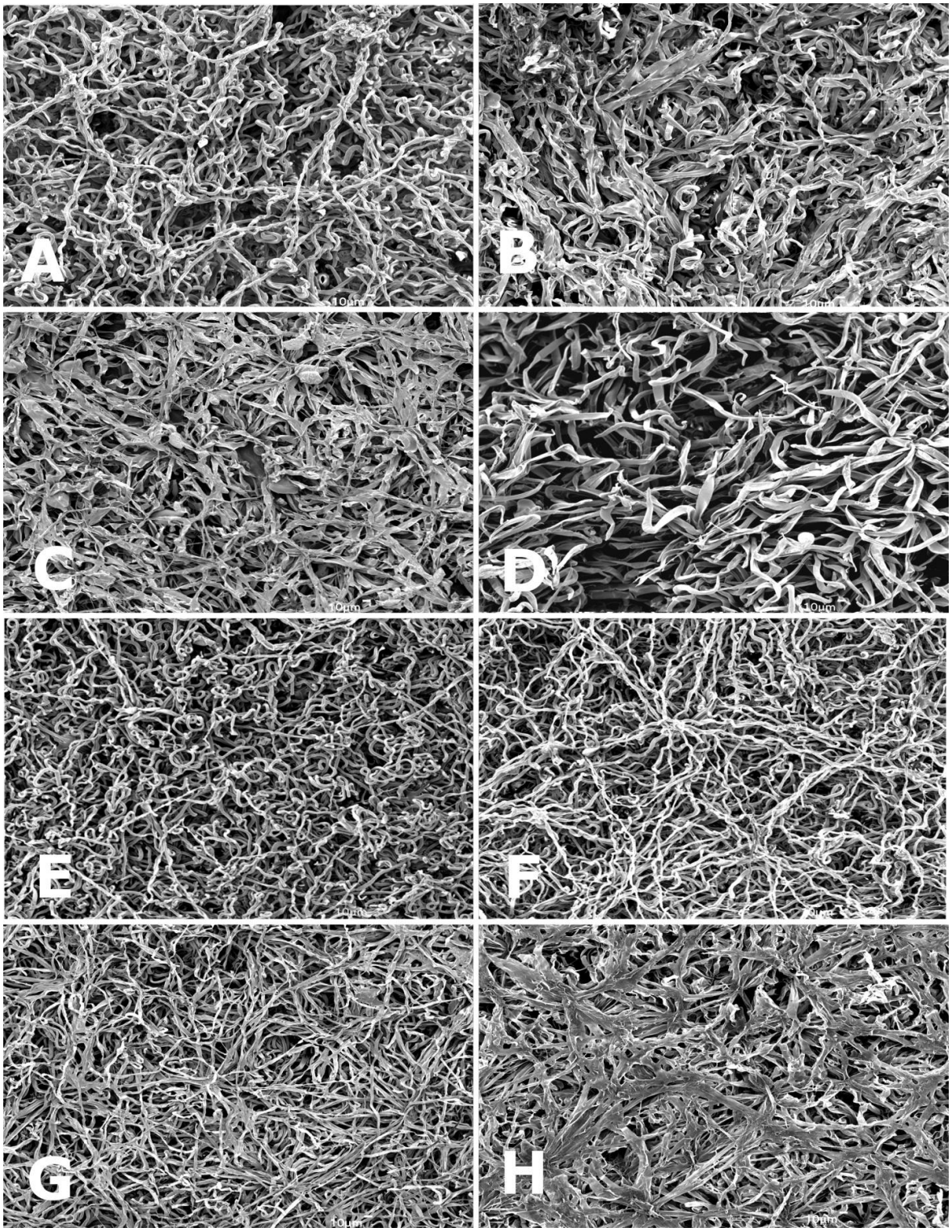

Fig. 10. Tricomas amorfos da face abaxial das folhas das espécies do clado *Albicans.* A. *Miconia albicans* (*Heringer 93,* NY). B. *M. alborufescens* (*Queiroz 5338*, NY). C. *M. argyrophylla* (*Prance 14901*, NY). D. *M. fallax* (*Jansen-Jacobs 1047,* NY). E. *M. hypoleuca* (*Thomas 11056*, NY). F. *M. lourteigiana* (*Quinet 1324*, NY). G. *M. navioensis* (*Meirelles, 990* UEC). H. *M. pterocaulon* (*Coelho 62*, NY).

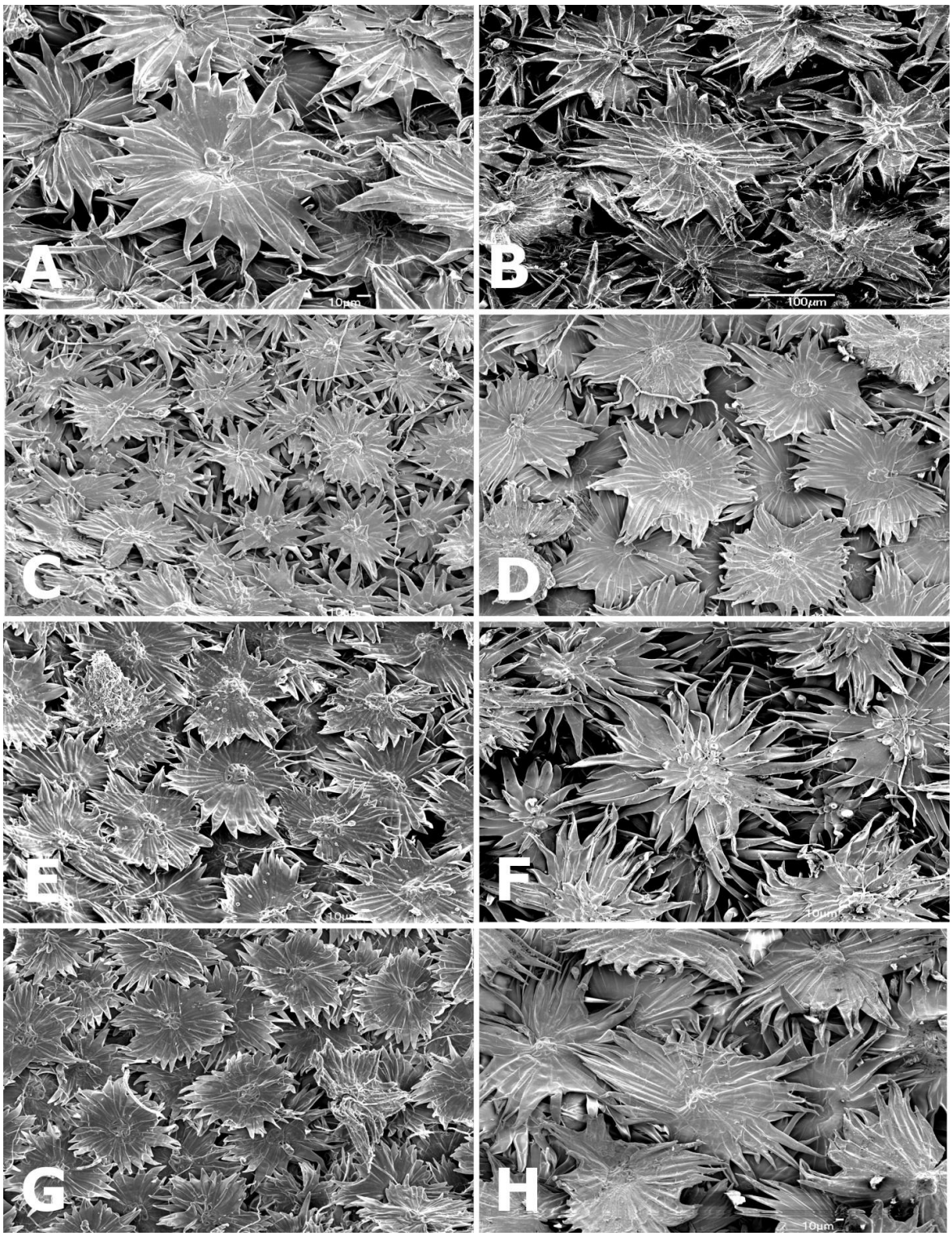

Fig. 11. Tricomas estrelados lepidotos da face abaxial das folhas das espécies do clado *Chrysophylla:* A. *Miconia amnicola* (*Rimachi 10915*, NY). B. *M. chrysophylla* (NY). C. *M. cowanii* (*Daly 4035a*, NY). D. *M. dichrophylla* (*Ferreira 5365,* NY). E. *M. punctata* (Goldenberg 93, NY). F. *M. tiliifolia* (*Boelter 440*, NY). G. H. *Miconia* sp. nov. (*Silva 180,* NY).

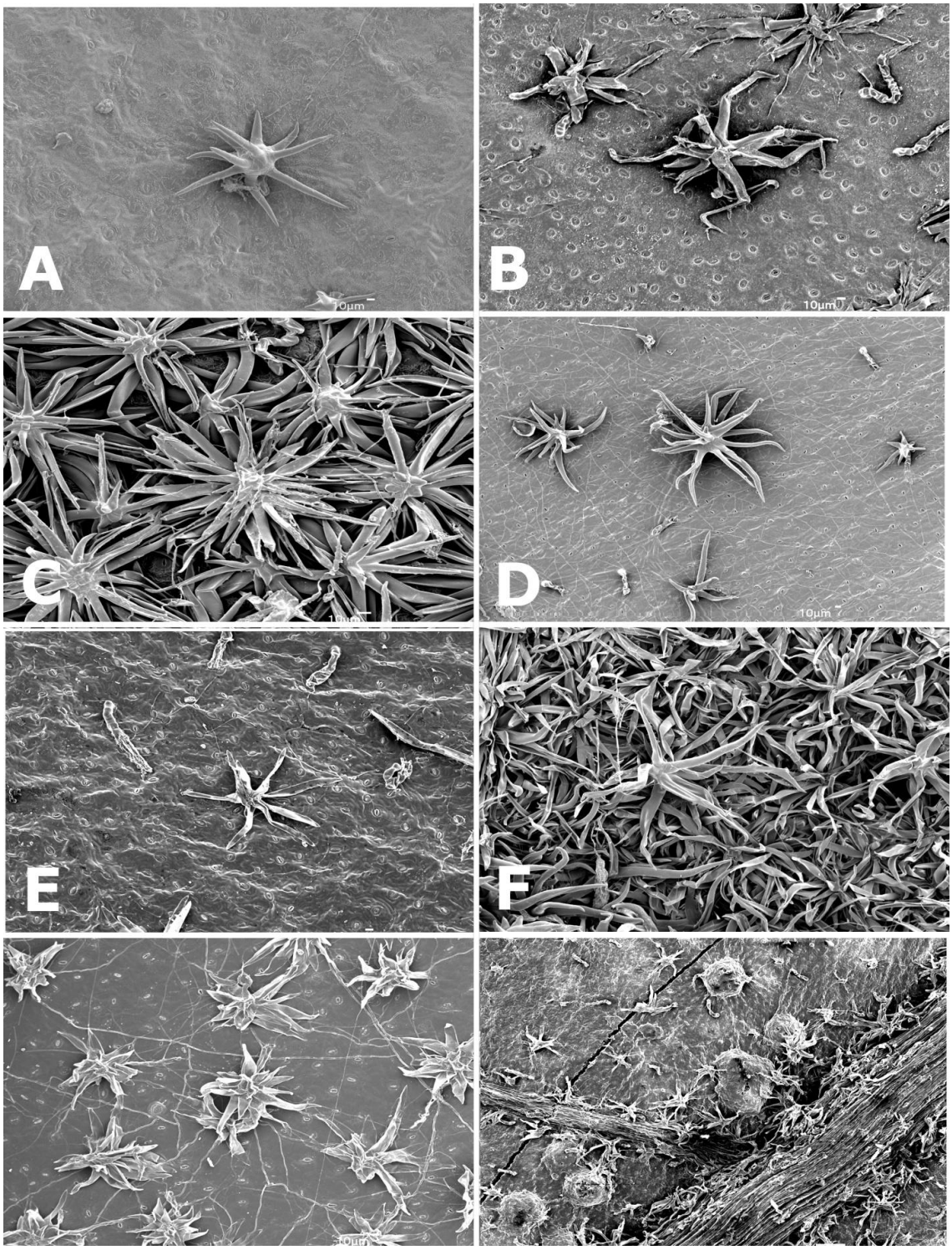

Fig 12. Tricomas estrelados da face abaxial das folhas das espécies do clado *Multispicata*: A. *Miconia eriodonta* (*Silva 1038*, NY). B. *M. glazioviana* (*Glaziou 16949*, NY). C. *M. lepidota* (*Pereira-Silva 15080*, NY). D. *M. multispicata* (*Philipson 1395,* NY). E. *M. polyandra* (*Glaziou 8363*, NY). F. *M. rondoniensis* sp. nov, (*Boelter 460*, NY). G. *M. ruficalyx* (*Carvalho 6098,* NY). H. *Miconia valtheri* (*Góes 100*, NY).

4. Discussão

Implicações taxonômicas

Em todas as análises, a subseção *Seriatiflorae* da seção *Miconia*, como tradicionalmente delimitada, não é resolvida como monofilética, mas sim, polifilética. Nas topologias obtidas nas análises de MP e IB, suas espécies aparecem distribuídas em quatro diferentes clados, entremeados por espécies de outras subseções e, até mesmo, de outras seções.

A subseção *Seriatiflorae* nunca foi o foco principal de nenhum estudo filogenético existente, porém nas filogenias produzidas para o gênero *Miconia* (Goldenberg 2008, Caddah 2013), já existiam algumas pistas de que este se tratava de um grupo artifical. Suas espécies situavam-se em um grado dentro do clado denominado "*Miconia IV*" por Goldenberg et al. (2008,) que realizou análises de MP com duas regiões (uma nuclear e uma plastidial). Em análise de máxima verossimilhança (MV) com seis regiões, essas mesmas espécies caíram separadas em quatro clados menores, dentro de um grado, que foram tratados como subseções novas por Caddah (2013): subsect. *Albicans*, subsect. *Chrysophylla*, subsect. *Discolor* (principal foco do trabalho supracitado) e subsect. *Multispicata*. Entretanto, cabe ressaltar que a amostragem da autora foi especialmente voltada para espécies com inflorescências glomeruladas ocorrentes na Floresta Atlântica, predominantemente nas regiões sudeste e sul do Brasil e não contemplava muitos terminais de *Seriatiflorae,* quantos seriam necessários para confirmar ou não o seu monofiletismo. Para essa investigação foram utilizadas sequências obtidas em outros trabalhos (Michelangeli et al. 2004, 2008, Goldenberg et al. 2008, Caddah 2013) e outras inéditas (ex. , *M. argyrophylla* ssp. *gracilis*, *M. cinerea, M. fallax, M. navioensis*, *M. punctata* B, *M. secundiflora*, *M. serialis*, *M. suberosa* e *M. macuxi* sp. nov.). Sendo assim, buscamos aprofundar a amostragem e dar maior atenção ao Clado *Albicans* para viabilizar a sua monografia que foi sendo realizada paralelamente (Meirelles in prep.).

Considerando as árvores obtidas, podemos fazer algumas considerações sobre os terminais envolvidos. A inclusão de *M. longispicata* (sect. *Miconia*, subsect. *Aplostachyae*) e *M. suberosa* no clado *Albicans* pode ser questionada. Ambas as espécies possuem características morfológicas marcantes que as distinguem do restante do clado *Albicans*. *M. longispicata* possui inflorescência espigada e indumento estrelado. *M. suberosa* também é bastante diferente do restante das espécies com inflorescência panícula, tricomas dentríticos e estrelados (Meirelles e Goldenberg 2014). Além das características morfológicas que

distinguem essas duas espécies do restante do clado *Albicans*, nas análises de máxima parcimônia das regiões nucleares, elas situam-se em um clado irmão ao clado *Chrysophylla,* com que compartilha algumas características morfológicas: a coloração ferrugínea do indumento e o fato de este ser composto por tricomas ramificados, facilmente individualizáveis, e não amorfos.

Seriatiflorae e as Subseções de Caddah (2013)

Sendo *Seriatiflorae* um grupo polifilético, buscou-se entender onde se situavam suas espécies na filogenia do gênero *Miconia* e as possíveis relações entre os clados com as espécies desta subseção. Assim como o trabalho de Caddah (2013), nossos resultados apontaram as espécies da subseção *Seriatiflorae* distribuídas em quatro clados diferentes que, seguindo a obra supracitada, foram denominados aqui *Albicans, Chrysophylla, Discolor e Multispicata*. Todos esses clados juntos compõem um clado maior bem sustentado, composto por espécies com folhas discolores e tratado por Caddah (2013) como a nova seção *Discolor*, que tem como possível sinapomorfia morfológica as folhas discolores com superfície abaxial totalmente recoberta por tricomas ramificados cinéreos ou ferrugíneos.

Apesar de os clados *Albicans, Chrysophylla, Discolor e Multispicata* serem bem sustentados em ambas as análises (MP e IB), as relações entre os clados ainda não estão claras. Esses clados, por sua vez, corroboram as novas seções propostas por Caddah (2013), relevantes na busca por grupos naturais, importantes para o estabelecimento de uma nova classificação infragenérica para *Miconia* (Tabela 5).

Para algumas espécies, não foi possível a extração de DNA para sequenciamento de todas as regiões, por falha no procedimento com materiais de herbário, ou por terem algumas regiões que não amplificaram, resultando em "*missing data"* excessivos que diminuíram o suporte das análises iniciais. Essas espécies não foram incluídas nas análises finais, porém devem ser acrescentadas a esses grupos naturais citados como subseções por Caddah (2013) devido às semelhanças morfológicas e moleculares (ver Capítulo 3):

Tabela 5. Atuais subseções da seção *Discolor* com a presença de espécies anteriormente em seção *Miconia* subseção *Seriatiflorae*

Subsect. *Seriatiflorae* Naudin (Cogniaux 1891)	**Subsect. *Albicans* Caddah (este estudo)**	**Subsect. *Chrysophylla* Caddah (este estudo)**	**Subsect. *Discolor* Caddah (este estudo)**	**Subsect. Multispicata Caddah (este estudo)**
M. albicans	*M. albicans*	*M. amnicola*	*M. discolor*	*M. eichlerii*
*M. ambigua**	*M. alborufescens*	*M. carajensis sp. nov.*		*M. glazioviana*
M. argentea	*M. argyrophylla*	*M. cowanii*		*M. kriegeriana*
M. argyrophylla	*M. argyrophylla ssp. gracilis*	*M. chrysophylla*		*M. lepidota*
M. cinerea	*M. astrocalyx sp. nov.*	*M. dichrophylla*		*M. mellina*
M. discolor	*M. cinerea*	*M. dispar*		*M. multispicata*
M. dispar	*M. fallax*	*M. ferruginata*		*M. polyandra*
M. eriodonta	*M. herpetica*	*M. heliotropoides*		*M. pseudoeichlerii*
M. fallax	*M. hypoleuca*	*M. macrothyrsa*		*M. pulchra*
M. ferruginata	*M. longispicata*	*M. punctata* A		*M. rondoniensis*
M. glazioviana	*M. lourteigiana*	*M. punctata* B		*M. sagotiana*
M. goudotii	*M. macuxi*	*M. rufescens*		*M. ruficalyx*
M. heliotropoides	*M. navioensis*	*M. tiliifolia*		*M. valtheri*
M. herpetica	*M. pterocaulon*	*M. wittii*		
M. laevigata	*M. secundiflora*	*Miconia* sp. nov. 1		
M. lepidota	*M.serialis*	*Miconia* sp. nov. 2		
M. macrothyrsa	*M. suberosa*	*Miconia* sp. nov. 3		
M. pennipilis	*M. weddellii*			
M. polyandra	*Miconia* sp. nov. 4			
M. pterocaulon				
M. pulchra				
M. punctata				
M. sagotiana				
*M. scorpioides**				
M. secundiflora				
M. serialis				
M. stenostachya				
M. tiliaefolia				
*M. tomentella**				
M. trinervia				
*M. virescens**				

*nomes não aceitos na atualidade por sinonimização sob outras espécies

Implicações evolutivas e Caracteres morfológicos

A reprodução assexuada é muito comum na tribo *Miconieae,* onde há uma grande quantia de espécies apomíticas (Goldenberg e Shepherd 1998). No grupo estudado, algumas espécies são apomíticas: *M. albicans, M. argyrophylla, M. fallax, M. ferruginata* e *M. stenostachya* (Baumgratz e Ferreira 1986, Renner 1989, Goldenberg e Shepherd 1998, Santos et al. 2012, Caetano et al. 2013a). O processo meiótico de produção de pólen ocorre com fortes irregularidades na maioria das anteras de *M. fallax* e *M. stenostachya* e não foi observada em *M. albicans* (Cortez et al. 2014).

As inflorescências secundas escorpioides ocorrem em, pelo menos, mais dois clados na tribo *Miconieae:* no clado A do gênero *Leandra,* seção *Secundiflorae* (Martin et al. 2008) e no gênero *Miconia*, na seção *Hartigia* (Goldenberg et al., 2008). Essa arquitetura de inflorescência é incomum em *Miconieae,* pode atuar otimizando a polinização e a dispersão.

As flores são mais ou menos congestas na antese, porém o eixo da inflorescência continua se alongando após a polinização. Dessa forma, apresentam aos polinizadores flores mais próximas e aos dispersores frutos mais afastados uns dos outros, sendo então oferecidos individualmente (Goldenberg et al. 2008).

Para o subclado *Fallax,* a presença de pétalas com margens cilioladas glandulares em todas as espécies representa uma sinapomorfia. Sua importância poderia estar relacionada com a biologia reprodutiva dessas espécies Os tricomas das margens das pétalas de *M. stenostachya* foram citados como responsáveis pela produção de odor nessas estruturas (Baumgratz e Ferreira 1986). Dessa maneira, podemos supor que as pétalas glandulares cilioladas de todas as espécies do subclado *Fallax* também possam produzir odores como atrativo para polinizadores .

Na seção *Discolor,* as inflorescências escorpioides surgiram uma única vez (Fig. 4.). Na história do grupo de *Miconia* com folhas discolores, elas são especialmente uniformes e predominantes no clado *albicans*. As inflorescências dicasiais que ocorrem nos terminais mais basais seriam ancestrais no grupo e teriam dado origem àquelas com ramos escorpioides que, por sua vez, teriam originado as panículas com flores glomeruladas. Nessas inflorescências glomeruladas, aparentemente há uma transferência da unidade de polinização da flor para pseudantos formados por esses glomérulos (Caddah 2013).

Melastomataceae é a família de angiospermas com maior diversidade de tipos de tricomas e indumentos (Wurdack, 1986). Entretanto, a evolução de determinados tipos de tricomas ocorreu de forma paralela em diferentes gêneros ou divisões subgenéricas, o que é especialmente evidente nas seções de *Miconia* (Wurdack, 1986). Ainda que a criação de novas chaves taxonômicas para a classificação interna de *Miconia* sejam prematuras (Caddah 2013), é possível distinguir os clados com espécies da subseção *Seriatiflorae* pelo tipo de indumento que possuem (Figs. 10, 11 e 12).

5. Conclusões

Em todas as análises *Miconia* sect. *Miconia* subsect. *Seriatiflorae,* como tradicionalmente circunscrita, não é monofilética. As espécies listadas para a subseção no trabalho de Naudin (1849-1853) estão, na realidade, distribuídas em quatro clados principais que correspondem juntos à seção *Discolor* Caddah*,* recentemente proposta. Esse estudo confirma a necessidade de uma nova classificação infragenérica em *Miconia*, dando respaldo

à nova classificação proposta por Caddah (2013). Além disso, nosso trabalho delimitou melhor um grupo de espécies amplamente distribuídas no neotrópico, possibilitando a revisão taxonômica do clado A*lbicans* (Capítulo 3) e confirmando suspeitas de sinonímias e espécies novas.

Para melhor compreensão dos processos evolutivos envolvidos na origem do grupo estudado, são imprescindíveis maiores estudos de biogeografia histórica, biologia reprodutiva, citologia e genética de populações. No caso das espécies com ampla distribuição geográfica, tais como *M. albicans*, *M. fallax* e *M. stenostachya,* cabem também estudos de filogeografia, para averiguar a variabilidade genética intraespecífica ao longo da distribuição geográfica, dada a reprodução assexuada dessas espécies citadas em trabalhos anteriores.

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Capítulo II. Novidades em *Miconia* . Parte 1: ***Miconia suberosa*** Meirelles & R. Goldenb. Parte 2: ***Miconia macuxi*** Meirelles, Caddah & R. Goldenb. Parte 3: ***Miconia astrocalyx*** Meirelles & R. Goldenb. Parte 4: ***Miconia rondoniensis*** Meirelles & R. Goldenb.

Parte 1: ***Miconia suberosa*** Meirelles & R. Goldenb.

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A new species of *Miconia* (Miconieae, Melastomataceae) from the Brazilian Amazon

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Abstract

A new species of *Miconia* sect. *Miconia* subsection *Seriatiflorae*. was collected in Igapó Forests from the Purus-Madeira interfluve, in the state of Amazonas, Brazil. This new species, *Miconia suberosa,* can be distinguished from other species in the subsection by a variety of morphological features, namely: (i) treelet habit; (ii) deeply fissured bark with a thick cork; (iii) long dendritic hairs with short arms on young branches, inflorescences and leaves; (iv) petiolated leaves with rounded to obtuse bases, and ciliate margins, congested at the branch apices; and, (v) truncated stigmas.

Resumo

Uma nova espécie de *Miconia* sect. *Miconia* subsect. *Seriatiflorae* foi coletada em floresta de Igapó no interflúvio Purus-Madeira, no estado do Amazonas, Brasil. Essa nova espécie, *Miconia suberosa*, distingue-se dentre as demais espécies da subseção por várias características morfológicas, especialmente: (i) hábito de arvoreta; (ii) tronco profundamente

fissurado com espessa camada de súber; (iii) longos tricomas dentríticos com braços curtos sobre os ramos jovens, inflorescências e folhas; (iv) folhas pecioladas com base arredondada a obtusa e margens ciliadas, congestas nos ápices dos ramos; e, (v) estigmas truncados.

Introduction

Miconia Ruiz & Pavón (1794: 60) includes 1065 species, constituting the largest genus of Melastomataceae (Goldenberg *et al*., 2013). The genus belongs to the Tribe Miconieae which is characterized by fleshy fruits and inferior ovaries (Michelangeli *et al*. 2004). Species of the genus are shrubs, treelets, or trees, rarely climbers, ranging from western Mexico and the Caribbean to Uruguay and northern Argentina, and growing from sea level to the Andean Paramos (Goldenberg *et al.* 2008). The genus can be recognized by the terminal inflorescences, rounded, obtuse or retuse petals, and lack of ant domatia, among others (Cogniaux 1891, Goldenberg 2000). The high levels of homoplasy encountered in the genus and close relatives have led to overlapping patterns of morphological variation that have led to a complicated generic circumscription in this group (Judd & Skean 1991).

In Brazil, the genus is more diverse in the Brazilian Amazon, where more than half of its species occur (ca.166 of the 300 Brazilian species) (Goldenberg *et al*. 2013). Despite the constant efforts to document and inventory the Amazonian Floras (Black *et al.* 1950, Pires *et al.* 1953, Ter Steege *et al.* 2013), western Brazilian Amazon remains as a major gap in botanical knowledge, likely containing many undescribed species (Hopkins 2007). In particular, the interfluve between the Purus and Madeira rivers has yielded many recent discoveries, including new genera and species of fishes (Bührnheim *et al*. 2008), mammals (Roosmalen *et al*. 2002), and a new record for the angiosperm family Tetrameristaceae, previously only known from Venezuela (Viana *et al*. 2010). The new species of *Miconia* described here was first collected in the 1970´s along the BR-319 highway, between Manaus and Porto Velho; however, these earlier specimens lacked flowers, complicating the identification of this taxon. Recent new collections from this same species allowed us to study this taxon in further detail and confirm its identity.

Methods

Scanning electron micrographs (SEM) of the Parts of the leaves and seeds were obtained from herbarium specimens. Dried material were mounted on aluminum stubs with adhesive tabs, sputter coated with gold palladium in a Hummer 6.2 sputter coater, and

examined and photographed in a Jeol JSM-5410 LV Scanning Electron Microscope (SEM) as done by Kriebel & Almeda (2013).

Miconia suberosa **Meirelles & R. Goldenb., sp. nov.** sect. *Miconia* DC. (1828: 183) subsect. Naudin (1849–1853: 427) Type:—BRAZIL. Amazonas: Borba, Reserva de Desenvolvimento Sustentável do Igapó-Açu, 4°42'35.03"S 61°17'36.93"W, 26 October 2011, *J. Meirelles & D. Silva, 795* (Holotype: INPA!; Isotypes: UPCB!, NY!, UEC!, MG!).

Miconia suberosa is distinguished from other species from subsection *Seriatiflorae* by its deeply fissured bark with a thick cork, long dendritic hairs with short arms on young branches, inflorescences and leaves, petiolate leaves with rounded to obtuse bases and ciliate margins that are congested at the apices of branches, and truncate stigma.

Treelet 5–6 m high; branches rounded to quadrangular, densely covered by dendritic hairs with short arms. Bark with a cork layer ca. 3.5 cm thick, deeply fissured (depressions 2–4 mm deep), with rounded ant holes ca. 0.7 mm diam. Leaves opposite, congested in the terminal portion of the branch; petioles 1.5–7 cm long, densely covered by dendritic hairs with short arms; blades 24.5–47.5 X 8–19 cm, oblong, apex acuminate, base rounded to obtuse, margin ciliate, chartaceous, longitudinal nerves 3 plus a faint marginal pair, acrodromous, basal to shortly suprabasal (inner pair up to 8 mm distant from the base), transversal veins 43–50, discolorous, adaxial surface dark green, slightly bullate, glabrous to moderately covered with dendritic hairs 0.4–0.7 mm long, abaxial surface yellowish to tan, slightly foveolate, densely covered with stellate 0.4–0.6 mm diam., canescent hairs on the blade surface and dendritic ferruginous hairs 0.2–0.8 mm long on the veins. Inflorescences in panicles 10–37 cm, terminal, densely covered by dendritic hairs with short arms, branches of the inflorescence in a helicoid cyme; bracts 1.3–2 X 0.1–0.2 cm, linear, adaxial surface sparsely covered with dendritic hairs, abaxial surface densely covered with dendritic hairs with short arms; bracteoles 1.6–2.1 X 0.3–0.4 mm, linear, adaxial surface glabrous, abaxial surface densely covered with stellate, canescent hairs with short arms. Flowers pentamerous. Hypanthium 1.5–1.7 mm long (from the base to the torus), campanulate, densely covered with stellate hairs. Calyx persistent, truncate, tube 0.7 mm long, external teeth 0.2–0.4 mm. Petals 2.1–2.5 X 0.7–1.2 mm, white, oblong, apex round to retuse, margins entire, both surfaces glabrous. Stamens 10, white, slightly dimorphic in size, antesepalous with filaments 3.1–3.7 mm long,

antepetalous 2.5–2.9 mm, both glabrous; connectives prolonged ca. 0.2 mm below the thecae, the antesepalous with skirt-like appendages, ventrally slightly bilobed, and the antepetalous without skirt-like appendages, only with a small dorsal spur 0.2 mm long; anthers 1.5–1.6 mm in the antesepalous, 1–1.1 mm in the antepetalous, white, subulate, apex attenuate, pore ventrally inclined ca. 0.1 mm diam. Ovary 1–1.2 mm long, basally 2/3 inferior, 3-celled, the apex glabrous; style 3.5–7 mm long, straight, glabrous, stigma truncate. Fruits elliptical, green or orange when immature, black when ripe. 5.6 X 6 ×7.7 mm; seeds 2.3–2.7 X 1.6–1.9 mm, 5–8 per fruit, ovoid, angled, appendage absent, raphal zone obovate, the length covering 90-100% of the total length of the seed (Ocampo & Almeda, 2013) (Figures 1, 2, 3).

Additional material examined: Brazil. Amazonas: Estrada Manaus Porto Velho, Rio Castanho, Igarapé do Tupanazinho, 17 July 1972 (bud), M. F. Silva 796 (INPA); BR-319 ca. Km 235, Igapó-Açu black water várzea, 24 Nov. 1973 (fr.), E. Lleras & O. P. Monteiro P19674 (INPA); Borba, RDS Igapó-Açu, 26 Oct. 2011 (bud), J. Meirelles & Silva, D. 784 (INPA, UPCB).

Distribution and habitat – *Miconia suberosa* is only known from the margins of blackwater rivers in Brazilian Amazonian forests, where occurs in a transitional habitat between Terra firme forests and Igapó that is periodically flooded. This species has been collected in the Municipalities of Careiro Castanho and Borba, both of which are located south of the Solimões River, and north of the Madeira River.

Conservation status – Until this moment *Miconia suberosa* is known to occur within the Sustainable Development Reserve Igapó Açú, in the state of Amazonas. Besides the fact that at least one of population of *M. suberosa* is protected, this species can not be considered endangered following the IUCN (2014) ctiteria, since it´s area of occupancy is about 8.000 km² of continuous forest. Although, it is noteworthy that the entire region will be highly threatened by the rebuilding of the BR-319 road, which is planned to start soon. Many other endemic species besides *M. suberosa* will be affected, since road improvements tend to intensify development, and consequently increase deforestation in the area (Fearnside et al. 2009).

Etymology – The epithet *suberosa* refers to the thick cork found on the bark of these plants. The trunks of this species seem to be submerged in the river waters during the rainy season, when the thick cork seems to act as an insulating mechanism.

Taxonomy – Miconia suberosa can be placed in section *Miconia* DC. (1828: 183) due to its short, linear, single-pored anthers with skirt-like and ventrally bilobed connective appendages. Within section *Miconia*, this species belongs to subsection *Seriatiflorae* Naudin (1849–1853: 427). According to Cogniaux (1891), the species of subsect. *Seriatiflorae* have pyramidal panicles with bifid or trifid second (subscorpioid) branches.

Among the species of subsect. *Seriatiflorae*, only *Miconia dispar* Benth. (1850: 241) has a tree habit and leaves that are as large as those of *M. suberosa.* However, the leaf margins of *M. dispar* are not ciliate as in *M. suberosa,* and its branches. While the petioles and inflorescences of both species are covered with stellate-dendritic hairs; those of *M. dispar* are thicker and shorter than those of *M. suberosa* (0.2–0.5 mm long in *M. dispar* vs. 0.6-1 mm in *M. suberosa*). In addition, *Miconia dispar* has smaller petals (1.5–2 mm long vs. 2.1–2.5 in *M. suberosa*) and capitate stigmas (vs. truncate stigmas in *M. suberosa*).

Miconia secundiflora Cogn. (1886: 285) is another species of subsect. S*eriatiflorae*, that resembles *M. suberosa*. Both species share discolorous, bullate leaves with ciliate margins however, these species differs from *M. suberosa* by the shrubby habit and sessile leaves with an amplexicaul base. In addition, *M. secundiflora* is endemic to the campinaranas (forests above white sand soils) from the state of Pará.

Miconia suberosa is also vegetatively similar to *M. rugosa* Triana (1871: 106), from sect. *Adenodesma* (Naudin) Cogn. (1886: 217), due to its long ferrugineous hairs and large leaves. Nevertheless, *M. rugosa* has leaves with strongly supra basal vennation vs. basal to shortly suprabasal in *M. suberosa*, spicate inflorescences with glomerulate flowers vs. panicle with branchs disposed in helicoid cymes in *M. suberosa*; and large purple anthers with glandular connectives vs. short white anthers with non glandular connectives in *M. suberosa*.

Ecology – Miconia suberosa is myrmecophilous, housing ants of the genus *Pheidole* in cavities along the cork of its branches. These ants usually bring debris to the branches, petioles, and the base of the blades (on the abaxial surface), some of which can be frequently found in herbarium specimens. In the genus *Miconia* myrmecophitic species are rare. According to Michelangeli (2010), only four species from sections Amblyarrhena (Naudin) Triana ex Hook.f. (1867: 763) and Tamonea (1886: 238) have been found to house ants in hollow stems, none morphologically or phylogenetically related to *M. suberosa*.

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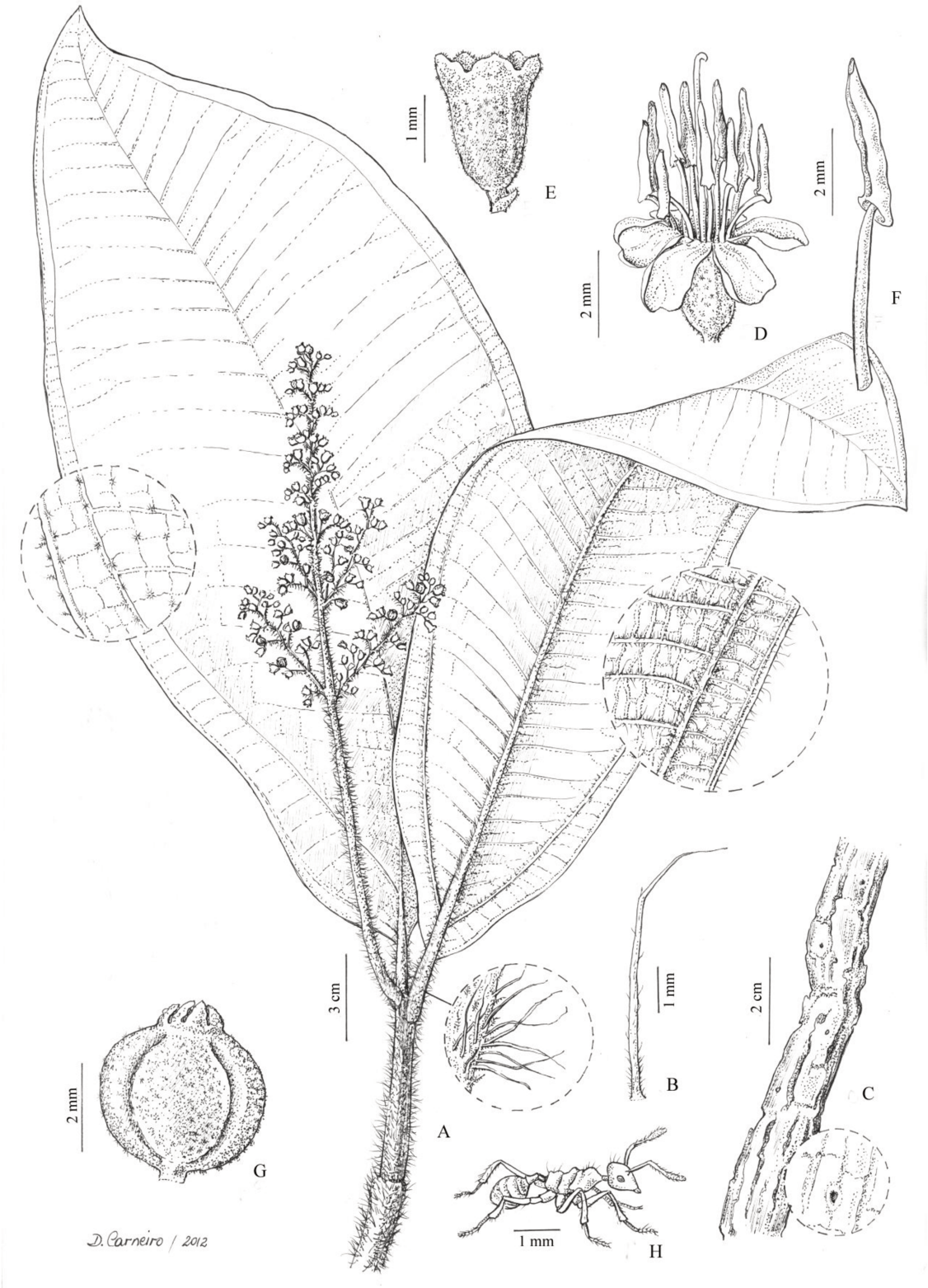

FIGURE. 1. A-H. *Miconia suberosa* (from the holotype). A. Habit with details of the indumentum. B. Trichome detail.of a dendritic hair with short arms. C. Branch with detail of an ant cavity. D. Flower. E. Hypanthium. F. Antesepalous stamen in lateral view showing skirt-like appendage. G. Fruit with persistent calyx. H. *Pheidole* ant.

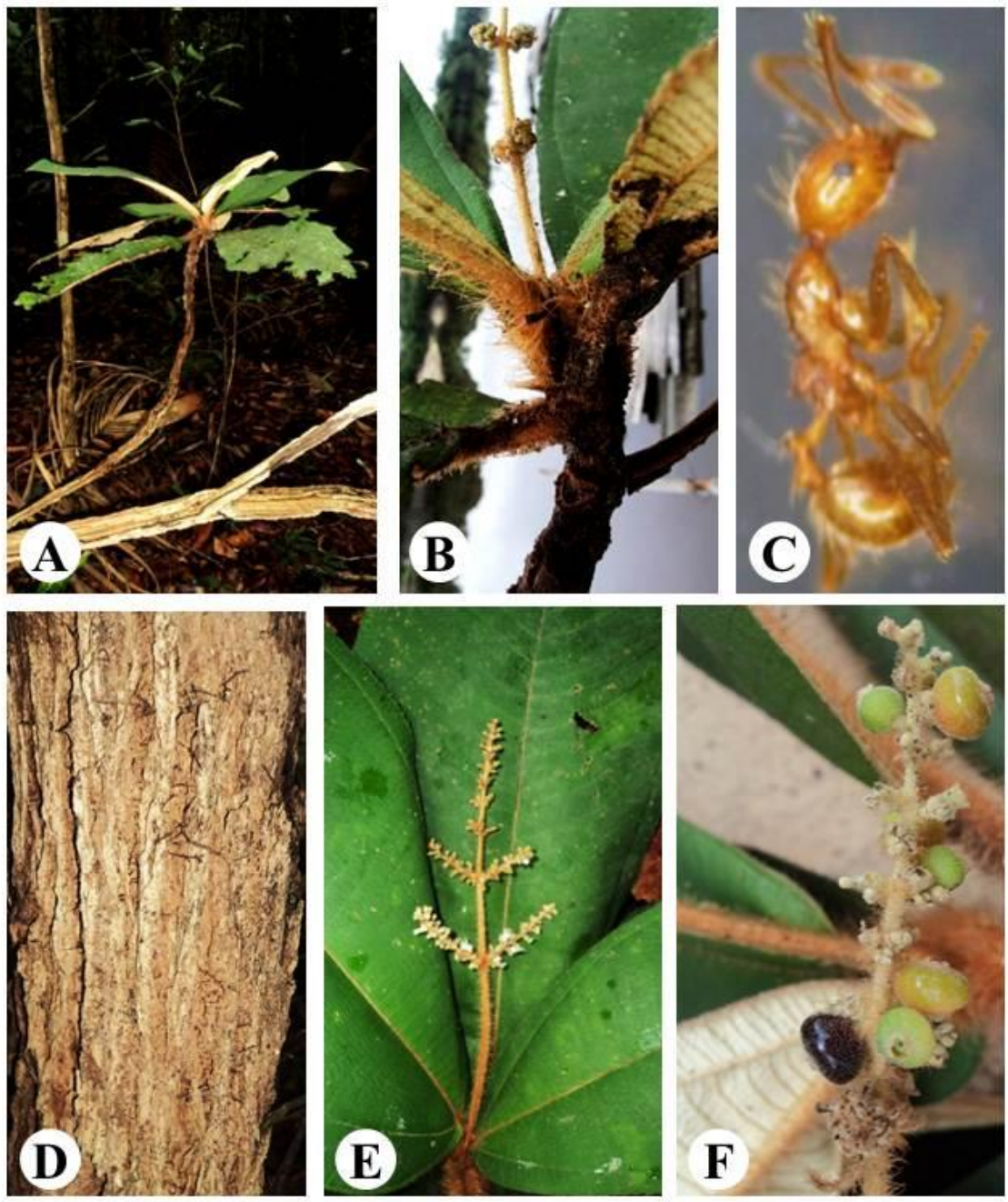

FIGURE. 2. A-F. *Miconia suberosa*. A. Twig with leaves congested at the apex. B. Deposition of organic material in the petioles and branches. C. *Pheidole* ant. D. Trunk with suberous bark. E. Inflorescence. F. Fruiting branch.

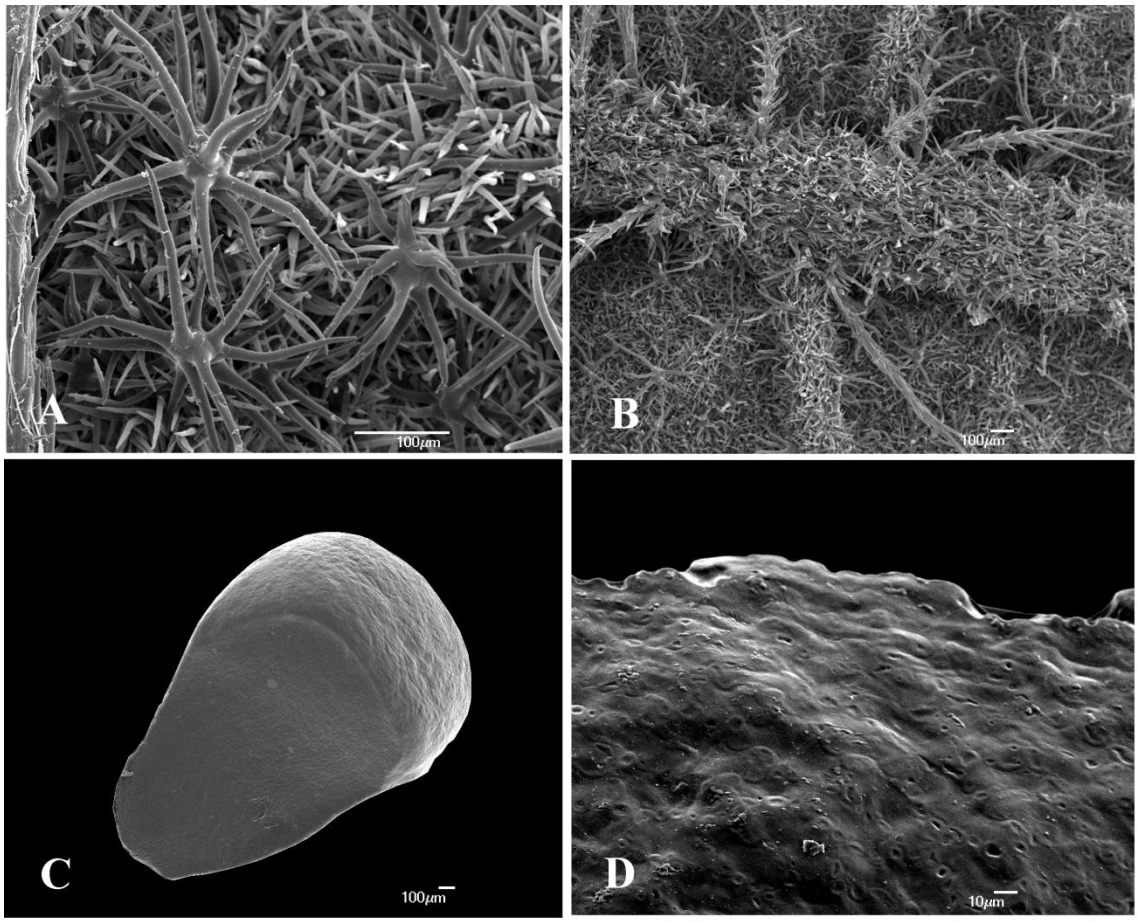

FIGURE. 3. A-D.*Miconia suberosa*. A. Indumentum on the abaxial surface of the leaf. B. Indumentum on the central vein (abaxial surface). C. Seed. D. Seed surface.

Parte 2: ***Miconia macuxi*** Meirelles, Caddah & R. Goldenb.

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Miconia macuxi (Miconieae, Melastomataceae): a new species from the Amazonian white sand vegetation

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Abstract

Miconia macuxi is described from the states of Roraima and Amazonas, in northern Brazil, and Atabapo and Amazonas, in southern Venezuela. It occurs on white sand vegetation, and can be recognized by the strongly discolorous leaves with dense stellate trichomes on their abaxial surfaces, secund inflorescences, petal margins with glandular-stipitate trichomes, and white stamens, the antepetalous with the connective with two ventral lobes and a dorsal tooth.

Key words: Brazil, campina, campinarana, Venezuela

Introduction

Miconia Ruiz & Pavón (1794: 60), in its strict sense (Triana 1871, Cogniaux 1891), has about 1,060 species (Goldenberg *et al.* 2013) and is not monophyletic (Goldenberg *et al.* 2008). It belongs to the tribe *Miconieae*, which in turn is monophyletic, and can be recognized as the Neotropical species of Melastomataceae with fleshy fruits, flowers not subtended by four bracts, stamens with short, unappendaged or only shortly appendaged connectives, and

vegetative parts lacking megastyloids (Michelangeli *et al.* 2004, Penneys *et al.* 2010). The addition of the other genera from tribe Miconieae is leading it to a broader *Miconia* sensu latu, with about 1,900 species, which comprises the whole tribe and thus will be regarded as monophyletic (Ionta & Judd 2012, Ionta *et al.* 2012, Goldenberg *et al.* 2013, Judd & Ionta 2013, Majure & Judd 2013a-b, Michelangeli & Meier 2013, Gamba *et al.* 2014, Gamba-Moreno & Almeda 2014, Judd & Majure 2014, Majure *et al.* 2014a-c, Michelangeli 2014, Ocampo & Almeda 2014). Either in a strict or in a broad sense, the genus occurs in a wide range of habitats, from Mexico to Argentina and from the sea level to the Andean Páramos (Goldenberg *et al.* 2013).

The new species described here has been only found in white-sand vegetation. White-sand areas are scatered across the Guayana Shield and the Amazon basin, and have nutrient-poor soils with low water retention capacity (Frasier *et al.* 2008). The vegetation types on it are popularly known as "Campinas" and "Campinaranas" and are characterized by sclerophylly, low diversity, and high endemism (Struwe *et al.* 1997, Anderson 1981, Daly & Fine 2011). Their structure greatly varies from grasslands and savannas to scrubs and forests, with a reduced biomass and highly irradiated community (Anderson 1981, Huber 1995, Janzen 1974).

Phylogenetic analyses using molecular data from several morphologically related species place this new species near *Miconia stenostachya* Candolle (1828: 181) and other species with glandular-ciliate petals (Meirelles *et al.*, in prep.). This places the new species in the traditionally circumscribed *Miconia*, more precisely in a group that has been recognized since Cogniaux (1891) as *Miconia* sect. *Miconia* Candolle (1828: 183) subsect. *Seriatiflorae* Naudin (1850: 145).

Miconia macuxi Meirelles, Caddah & R.Goldenb., *sp. nov***.**

Distinguished by the following set of features: strongly discolorous leaves with dense stellate trichomes on their abaxial surfaces, secund inflorescences, calyx persistent in fruit, petal margins with glandular-stipitate trichomes, and white stamens, the antepetalous with the connective with two ventral lobes and a dorsal tooth.

Type:—BRAZIL. Roraima: Caracaraí, Parque Nacional do Viruá, Estrada entre a entrada do parque e a sede. 21 October 2011 (fl, fr), *M.K.Caddah & J.Meirelles 900* (holotype: INPA!; isotypes: NY!, UPCB!, UEC!, UFRR!). Figures 1–3.

Shrubs up to 1.5 (-3) m high; young branches, petioles, abaxial surface of the leaves, panicles, outer surface of the hypanthium and outer surface of the calyx lobes densely covered by ferrugineous, stellate to shortly dendritic trichomes, with the axes usually darker than the arms mostly in the trichomes on the leaves, panicles and hypanthium. Young branches flattened, caniculate, with tenuous interpetiolar ridges. Leaves opposite, strongly discolorous; petioles 1-2.3 cm long, sulcate; blades 8-14 × 3-5 cm, elliptic-lanceolate, apex acute to shortly acuminate, base round to cordate, margin entire, sometimes slightly revolute, chartaceous, longitudinal nerves 3, with an additional marginal pair, basal, adaxial surface with sparse, caducous stellate trichomes in young leaves, then glabrous in mature ones, abaxial surface with a dense ferrugineous indument consisting of trichomes as described above. Panicles 3.5-5.5 × 2-4 cm, with short, bifid, secund branches; bracts and bracteoles up to 3.3 mm long, triangular to lanceolate, persistent. Flowers 5(6)-merous. Hypanthium 2.1-2.4 mm long, campanulate, inner surface glabrous; torus with sparse glandular trichomes. Calyx persistent in fruit, inner surface glabrous; tube 0.5 mm long, inner lobes 0.7 mm long, triangular, outer teeth not or up to 0.3 mm exceeding the inner lobes, subulate. Petals 2.8-4.1× 2.1-2.8 mm, white, elliptic to shortly obovate, apex emarginate and symmetric, margins with glandular-stipitate trichomes, both surfaces minutely papillose. Stamens white, dimorphic; filaments 3.1-3.7 mm long (antesepalous, larger whorl) or 2.3-2.7 mm (antepetalous, smaller whorl), glabrous; connectives not prolonged below the thecae, but skirt-like (larger whorl) or with two ventral lobes and a dorsal tooth (smaller whorl); anthers 1.7-2.3 mm long (larger whorl) or 1.8-2.1 mm long (smaller whorl), oblong with a single, small, terminal to ventrally (larger whorl) or dorsally (smaller whorl) displaced pore ca. 0.15 mm wide. Ovary ca. 1.5 mm long, half adherent to the hypanthium, 3-locular, apex sparsely furfuraceous; style 5.7-6.7 mm long, slightly curved, punctiform, with scatered glandular-stipitate trichomes on its basal half. Fruits baccate, 3.4-3.6 mm diam., purple with reddish persistent calyx lobes; seeds ca. 0.7-1 mm long, pyramidal, testa smooth, cells with anticlinal walls undulate.

Distribution and ecology:—*Miconia macuxi* is known from Amazonian white sand vegetation in Brazil and Venezuela. In Brazil, it is found in two National Parks in the state of Roraima (Viruá and Serra da Mocidade), as well as three localities in the state of Amazonas (Canutama, Careiro da Várzea and Nova Prainha), one of them in a State Park (Canutama). In Venezuela, it was found in the states of Amazonas and Atabapo.

Conservation status: —The lack of information doesn't allow us to formally estimate or infer possible threats to this species, as proposed in the IUCN Red List guidelines (IUCN Standards and Petitions Subcommittee 2014). However, we are still able to suspect that the extent of occurrence of *Miconia macuxi,* as calculated by the Geospatial Conservation Assessment Tool (http://geocat.kew.org) as 315,000 km^2, will drastically reduce in the next 100 years, since some localities in Venezuela and in Brazil are outside natural reserves and are threatened by habitat loss. Therefore, we are able to assign the species as Endangered under the IUCN criterion [EN A3c] (IUCN Standards and Petitions Subcommittee 2014).

Etymology:—The word "Macuxi" was originally the name of the native people that lived where is now the city of Boa Vista, in Roraima. Nowadays its meaning has been broadened and it refers to people and things that come from the state of Roraima, from where most specimens of this species have been collected.

Additional specimens examined:—**BRAZIL**. **Amazonas**: Canutama, Parque Estadual do Matupiri, 5°00'45"S, 61°16'15"W, 30 October 2010, *Prata et al. 864* (INPA), 31 October 2010, *Prata et al. 915* (INPA)*;* Careiro da Várzea, 19 July 2007, *Silva 141* (INPA); Nova Prainha, Projeto Radam Brasil, SB-20-ZC, Ponto 02, 24 July 1976 (fr), *Mota & Monteiro s.n.* (INPA 60730). **Roraima**: Caracaraí, Parque Nacional da Serra da Mocidade, 1°16'56"N, 61°44'33"W, 23 March 2012 (fr), *Forzza et al. 6882* (MIRR, RB); Caracaraí, P. N. da Serra da Mocidade, Rio Capivara, 1°05'56"N, 61°55'38"W, 7 December 2013 (bud), *Schütz-Rodrigues et al. 2358* (MIRR, UFRR); Caracaraí, P. N. da Serra da Mocidade, Rio Capivara, December 2013 (bud), *Schütz-Rodrigues et al. 2359* (MIRR, UFRR); Caracaraí, P. N. da Serra da Mocidade, Rio Capivara, 7 December 2013 (bud), *Schütz-Rodrigues et al. 2364* (MIRR, UFRR); Caracaraí, P. N. da Serra da Mocidade, Igarapé Água branca ("Preto"), 7 December 2013 (bud), *Schütz-Rodrigues et al. 2397* (UFRR); Caracaraí, P. N. da Serra da Mocidade, Rio Capivara, 1°12'13"N, 61°56'23"W 8 December 2013 (fl), *Schütz-Rodrigues et al. 2408* (UFRR); Caracaraí, P. N. da Serra da Mocidade, Rio Água Boa do Univini, 1°23'04"N, 60°39'23"W, 10 December 2013 (fl), *Schütz-Rodrigues et al. 2459* (MIRR, UFRR, UPCB); Caracaraí, P. N. da Serra da Mocidade, Rio Água Boa do Univini, 1°23'04"N, 60°39'23"W, 10 December 2013 (fl), *Schütz-Rodrigues et al. 2489* (MIRR, UFRR, UPCB); Caracaraí, Parque Nacional do Viruá, Campinarana, Estirão do Jurema, 1°02'18"N, 61°14'29"W, 30 July 2011 (bud, fl), *Zartman et al. 8506* (INPA, NY, UPCB); Caracaraí, P. N. do Viruá, "Depois da segunda bueira", 25 January 2011 (fr), *Cangani et al. 132* (INPA, UFRR); Caracaraí, P. N. do

Viruá, BR-174, 19 October 2011 (bud, fl), *Meirelles et al. 761* (INPA, UPCB); Caracaraí, P. N. do Viruá, 21 October 2011 (fl, fr), *Goldenberg et al. 1594* (INPA, UPCB). **VENEZUELA**. **Amazonas**: La Esmeralda, 2 November 1928, *Tate 322* (NY, P, US), 14 November 1950, *Maguire 29432* (NY). **Atabapo:** Cerro Huachamacari, 5 March 1980, *Huber 4998* (NY, US), 24 February 1985, *Liesner 17918* (US).

Comments:—*Miconia macuxi* and related species belongs to *Miconia* sect. *Miconia* subsect. *Seriatiflorae*, sensu Cogniaux (1891). These plants can be recognized by the apical inflorescences with secund branches, and anthers that are linear to oblong, uniporate, with connectives bearing basal-ventral projections. Among the species in this subsection, *M. macuxi* seems to be closely related to a group of four species (Meirelles *et al.* in prep.): *M. argyrophylla* Candolle (1828: 181), *M. fallax* Candolle (1828: 181), *M. pterocaulon* Triana (1871: 114), and *M. stenostachya*. They have strongly discolorous leaves, glandular-ciliate petals, antepetalous stamens with anther connective appendages that are small and bilobate (not “skirt-like"), and blue-black ripe fruits, but all of them differ from *M. macuxi* due to the abaxial leaf surfaces covered with dense amorphous trichomes (arachnoid indument) (vs. stellate to shortly dendritic trichomes). *Miconia fallax* and *M. stenostachya* are shrubs occurring in savannah or open vegetation, and also differ from *M. macuxi* due to their yellow anthers (vs. persistently white), with connectives turning into red in older flowers. *M. argyrophylla* also differ from *M. macuxi* due to the deciduous calyx lobes (vs. persistent) while *M. pterocaulon* also differ due to the strongly winged young branches (vs. flattened). Both species are treelets or trees usually occuring in the understorey of "terra firme" (never flooded) forest.

Miconia macuxi also resembles *M. albicans* (Swartz 1788: 70) Steudel (1841: 139), another species from the same subsection that has discolorous leaves and white stamens. Nevertheless, *M. albicans* has amorphous trichomes on the abaxial leaf surface, eciliate petals, all stamens with skirt-like basal appendages and jade-green mature fruits.

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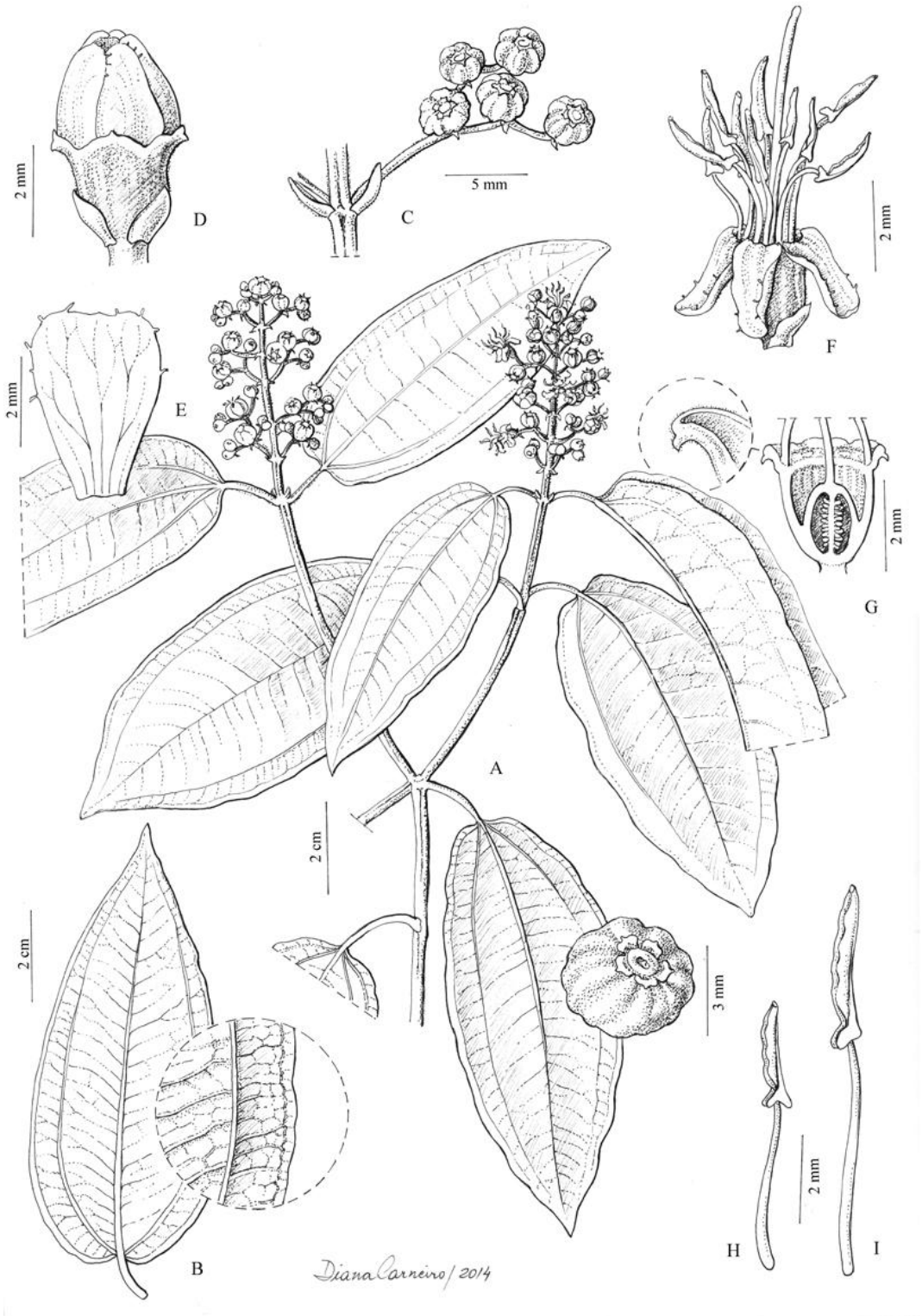

FIGURE 1. *Miconia macuxi* (from the isotype at UPCB). A. Branch with leaves, flowers and fruits. B. Abaxial surface of the leaf. C. Branch with fruits. D. Flower bud. E. Petal. F. Flower. G. Longitudinal section of the hypanthium and ovary, in detail, outer tooth of the sepals. H. Antepetalous stamen. I. Antesepalous stamen.

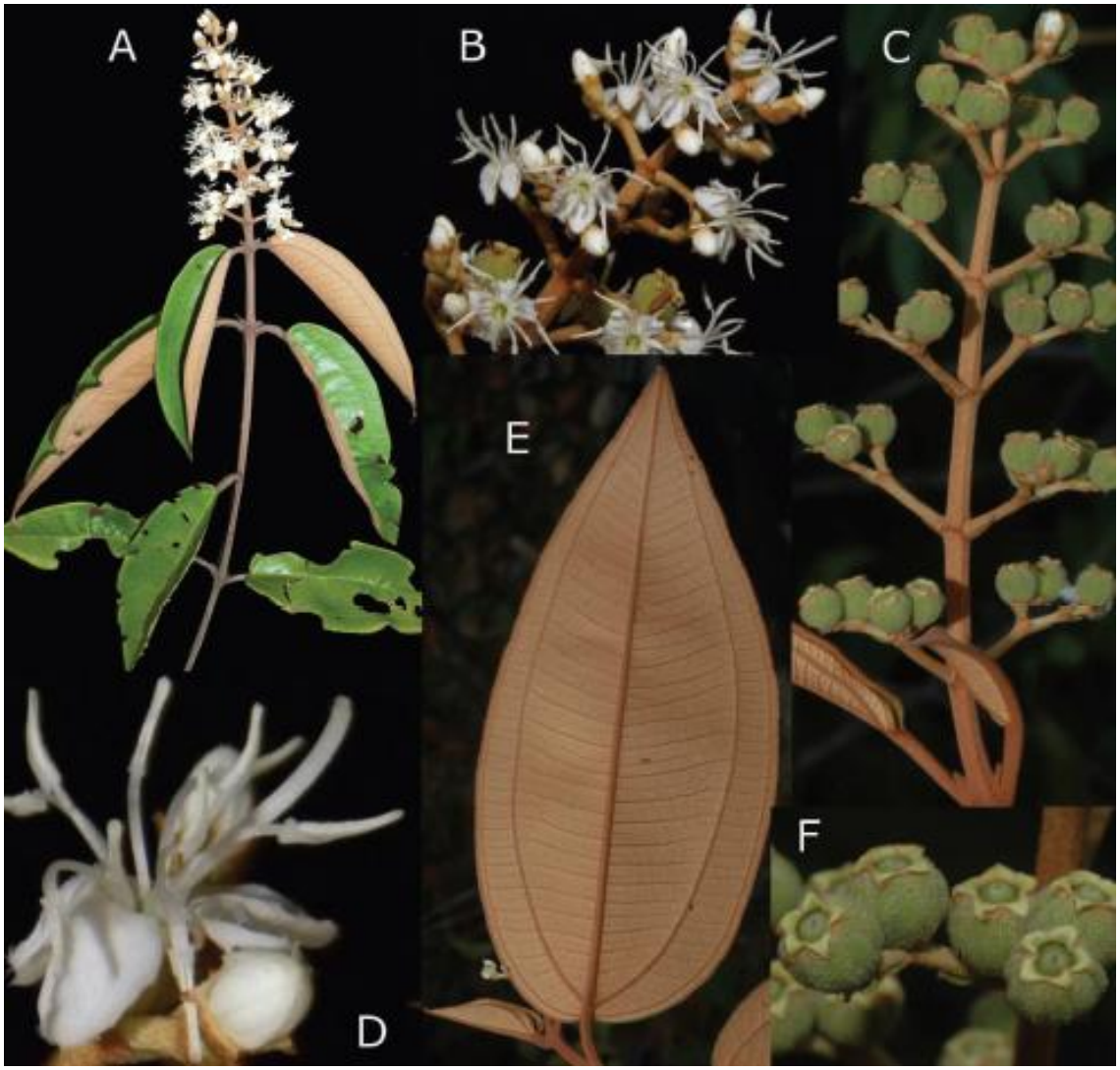

FIGURE 2. Live plants of *Miconia macuxi.* A. Flowering branch. B. Detail of the inflorescence. C. Fruiting branch. D. Flower Immature fruits. E. Leaf, abaxial surface. F. Flower (A: Mayara Caddah [from *Caddah & Meirelles 900*]; B, D. Gustavo Shimizu [*Caddah & Meirelles 900*]; C, E, F: Renato Goldenberg [cf. *Goldenberg et al. 1594*].

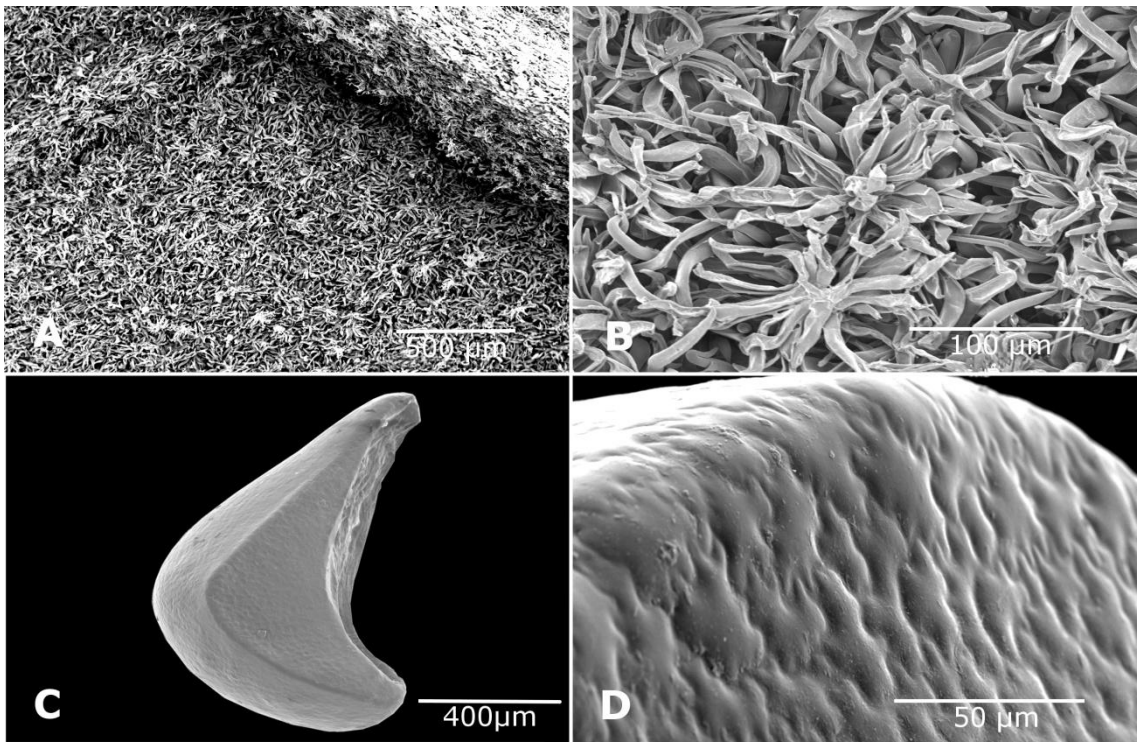

FIGURE 3. SEM Images of trichomes and seeds of *Miconia macuxi*. A-B. Indument on the leaf abaxial surface (*Caddah & Meirelles 900* NY); C. Seed (*Huber 4998* NY). D. Seed surface.

Parte 3: ***Miconia astrocalyx*** Meirelles & R. Goldenb.

(Manuscrito preparado nas normas do periódico *Kew Bulletin*)

Miconia astrocalyx: a new species in *Miconia* sect. *Miconia* (Miconieae, Melastomataceae) from Cerrado, Brazil

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Summary. A new species of *Miconia* Ruiz & Pav., sect. *Miconia*, subsect. *Seriatiflorae* is described and illustrated: *Miconia astrocalyx* Meirelles & R. Goldenb. This new species occurs no Cerrado vegetation in the southwest of Chapada Diamantina in Brazil.

Resumo. Uma nova espécie de *Miconia* Ruiz & Pav., sect. *Miconia*, subsect. *Seriatiflorae* é descrita e ilustrada nesse artigo. *Miconia astrocalyx* Meirelles, Lima & R. Goldenb. Esta nova espécie ocorre no cerrado no sudoeste da Chapada Diamantina no Brasil.

Key words. Miconieae, taxonomy, Seriatiflorae.

Introduction

Miconia Ruiz & Pav. is the largest genus in Melastomataceae with 1057 spp. exclusively from the Neotropics (Goldenberg et al. 2013). The most important taxonomic features to recognize species in the genus are presence and kind of leaf indument, morphology of inflorescence, anthers and connectives appendages. More details about *Miconia* can be found in Goldenberg *et al.* (2008) and Meirelles & Goldenberg (2014). During the ongoing molecular and taxonomic studies in the the *Miconia albicans* (Sw.) Steud. clade (subsect. *Seriatiflorae*) we found a new, neglected, species in the material examined in the herbaria K, HUEFS, MBM, RB, UPCB and US. Additionally we found and recollected material in field.

Miconia astrocalyx Meirelles & R.Goldenb., **sp. nov.** Type: Brazil. Bahia, Rio de Contas, Estrada para Marcolino Moura após km 2 (fr), *J.Meirelles et al. 905* (holotype: UPCB!; isotypes: INPA!, K!, MBM!, MG!, NY!, HUEFS!, CEPEC!, RB!, US!).

Gnarled shrubs up to 3 m high; young branches, petioles, abaxial surface of the leaves, panicles, outer surface of the hypanthium and outer surface of the calyx lobes densely covered by yellowish, sessile, stellate trichomes. Young branches flattened, canaliculate. Leaves opposite, strongly discolorous; petioles 0.8-1.6 cm; blades 7.5-13 × 3.5-6 cm, oblong, base cordate, margin slightly crenulate, coriaceous, longitudinal nerves 3, with an additional marginal pair, basal, main and secondary nerves strongly prominent on abaxial surface, adaxial surface of young leaves sparsely to moderately covered by stellate thichomes, caducous in the mature leaves. Thyrse 4.5-10 × 3-4.5 cm secund, bifidis with few-flowerd branches; bracts and bracteoles up to 3 mm long, lanceolate, persistent. Flowers 5-merous. Hypanthium 1-1.5 mm long, campanulate, inner surface glabrous; with sparse glandular trichomes. Calyx persistent (reddish and deflex in fruit), inner surface glabrous but the basal line of the calyx lobes densely covered by simple canescent trichomes; tube 0.4 mm long, inner lobes 1.8-2 mm long., in vivo, triangular, outer teeth up to 0.2 mm extending the inner lobes. Petals 3.5-4×3.1-3.3 mm, white, elliptic to shortly obovate, apex rounded, margins ciliate with glandular-stipitate trichomes. Stamens yellow, dimorphic; filaments of the smaller stamens 1.7-2 mm long, of the longer ones 2.3-2.6 mm long, both glabrous; connectives not prolonged below the thecae, ventrally slightly bilobed and with a very small dorsal inconspicuous tooth; anthers of the smaller stamens 2.8-3 mm long, of the longer ones 3.1-3.5 mm long, yellow, oblong with a single, small, terminal pore, ca. 0.2 mm. Ovary 1.6 mm long, half adherent to the hypanthium, 3-locular, apex with sparse glandular-stipitate trichomes, style 3.5-4 mm long, punctiform, with scaterred glandular-stipitate trichomes in the basal half. Fruits baccate, 4.2-4.6 mm diam., purple; seeds ca. 1.6 mm long, pyramidal, testa smooth, cells with anticlinal wall undulate.

Recognition: *M. astrocalyx* can be distinguished by the stellate yellowish indument on branches and abaxial leaf surface and the large calyx lobes, persistent in fruit.

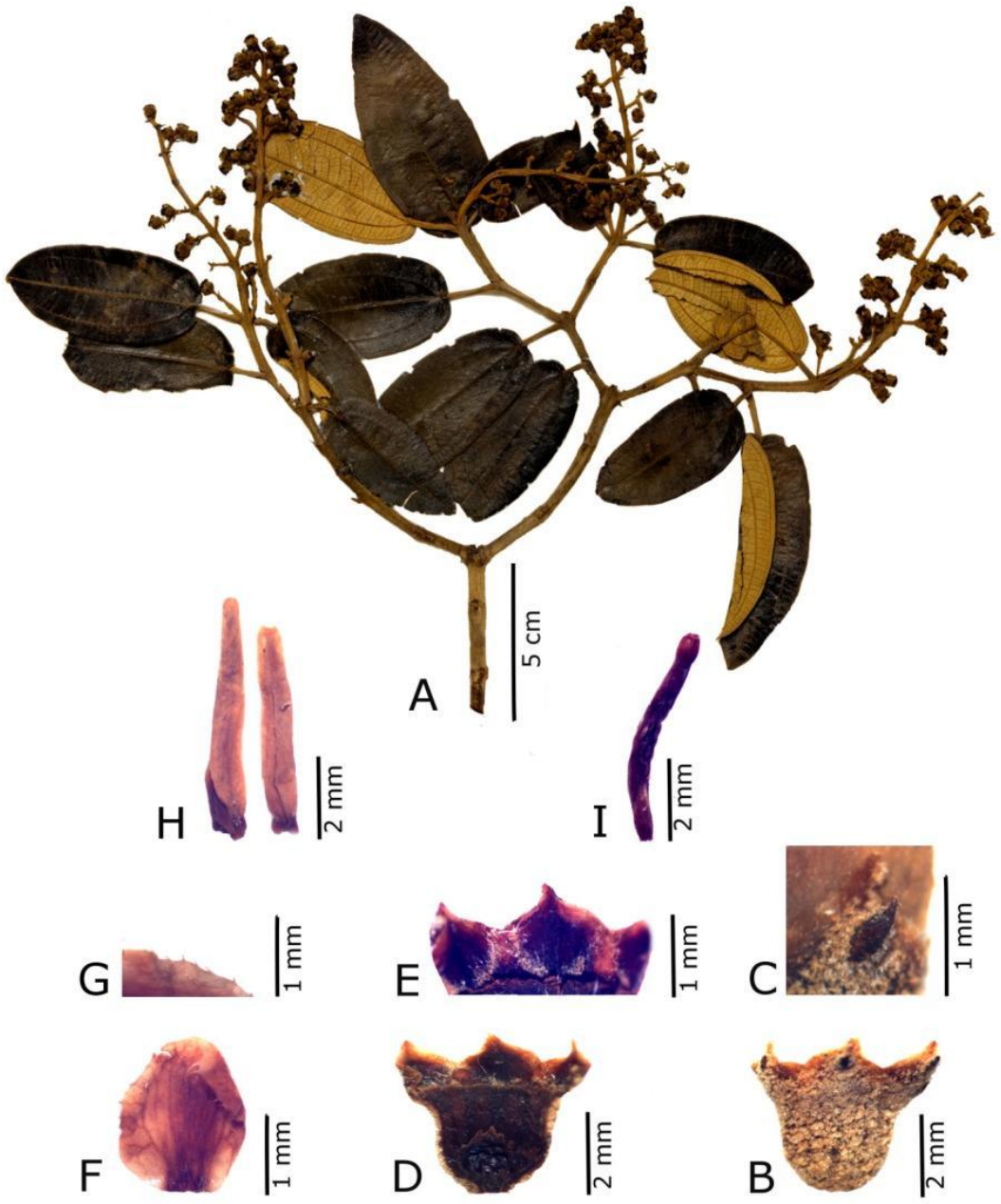

Fig.1 *Miconia astrocalyx* . A. Branch with fruits. B. External surface of hipanthium and calyx. C. Detail of the calyx external teeth. D. Hipanthium in longitudinal section. E. Inner surface of calyx with trichomes on the basal portion of lobes. F.Petal. G.Detail of the gladular-ciliolate margin of petal. H. Anther showing the two thecae, the connectives and apendages. I. Style.

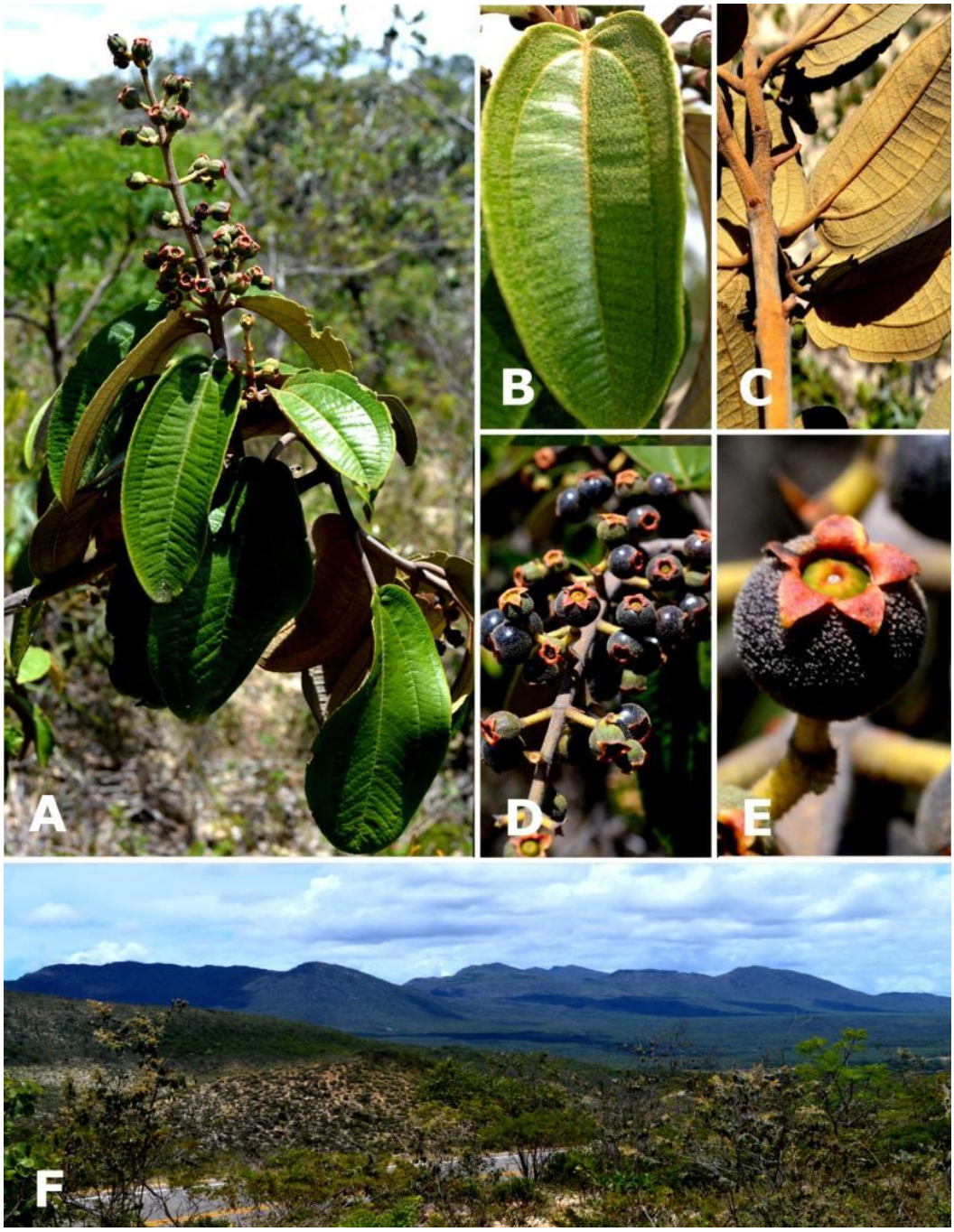

Fig. 2 *Miconia astrocalyx.* A.Habit. B.Adaxial leaf surface. C.Yellowish indument on branch and abaxial surface os leaves D. Inflorescence with ripe fruits. E. Fruit showing calyx lobes. F. Cerrado, Grasslands, and the mountains from the region of Rio de Contas, Bahia, Brazil.

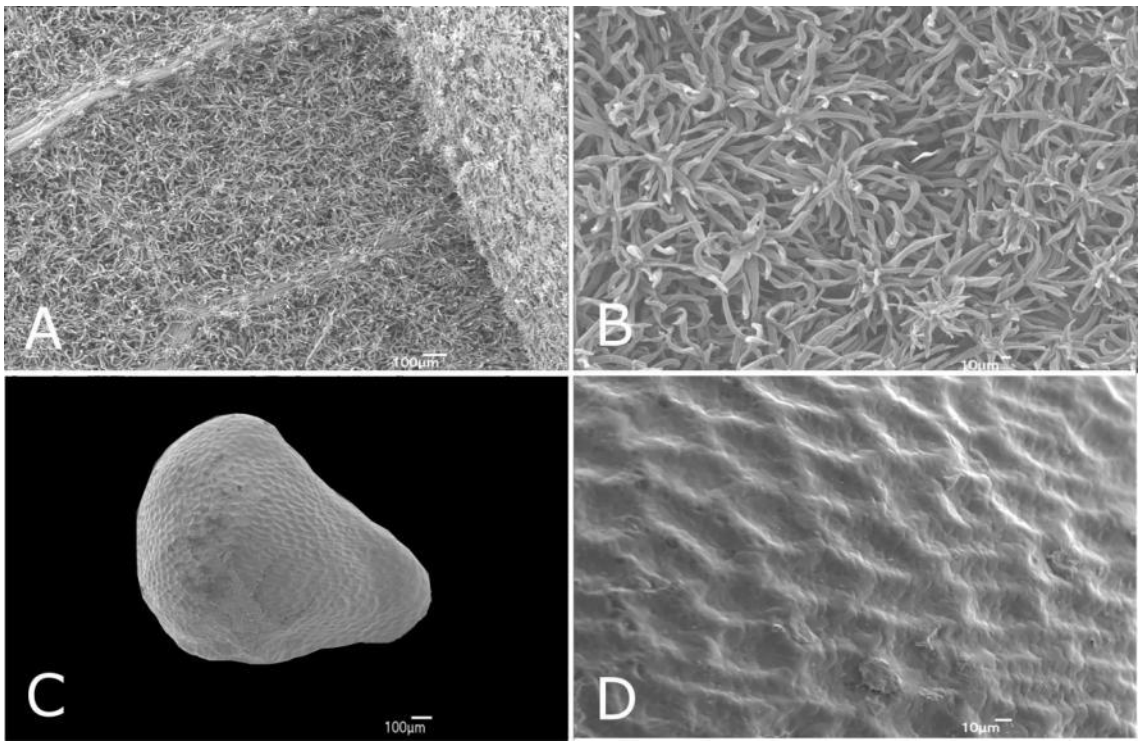

Fig. 3 *Miconia astrocalyx*. A-B. Indumentum on the abaxial surface of the leaf. C. Seed. D. Seed surface.

DISTRIBUTION. This species occurs in Brazil, in the region of Rio de Contas, southwestern portion of Chapada Diamantina, in Bahia state and in Posse, Goiás state.

SPECIMENS EXAMINED. BRAZIL. Bahia: Água Quente, Pico das Almas, 42º00' W, 13º31' S, 17 Dec 1988 (fr), *Harley et al. 27590* (K). Rio de Contas, 6 km north of Rio de Contas on Road to Abaira, 41º47'W, 13º33' S, 16 Jan 1974 (fr), *Harley et al. 15112* (K, RB), 16 Jan 1974 (fr), *Harley et al. 15120* (K), 5 km E. of Rio de Contas on the Marcolino Moura road, 41º48'W, 13º55'S, 27 Mar 1977 (bud), *Harley et al. 20052* (K, NY), Serra do Marcelino, 41º49'51"W, 13º35'33" S, 2 Feb 1997 (fr), *Passos et al. 4848* (HUEFS), Estrada Rio de Contas para Marcolino Moura, km 1.5, 41º47'52"W, 13º36'16" S, 18 Nov 2000 (fr), *Baumgratz 719* (RB), 2.6 km da cidade em linha reta, na estrada para Arapiranga, 41º47'34"W, 13º34'13"S, 27 Nov 2004 (fr), *Harley & Giulietti 55238* (UPCB). Goiás: Posse, Arredores, 8 Oct 1976 (fl), *Hatschbach 39074* (MBM, US).

HABITAT. *Miconia astrocalyx* occurs in Cerrado and in dry grasslands in white sandy or rocky soils, in elevations between 1000-1175 m. It occurs with low trees and shrubs.

CONSERVATION STATUS. Using the GeoCAT tool (Geocat-IUCN 2014) this species can be considered in the criteria LC (Least concerned) given the extense area of ocurrence between Posse (Goiás) and Rio de Contas (Bahia). However the collection gap between this two localities, 675 km apart from each other, may mean an error in the label or a poor collected route. In the first case, this species would be considered EN (Endangered) by the its restrict occurrence.

ETYMOLOGY. The epithet refers to the calyx lobes deflexed with acute apexes in fruit that resemble a star shape.

PHENOLOGY. *M. astrocalyx* was collected with bud and flowers from March to October and with fruits from November to February.

NOTES. This new species belongs to *Miconia* sect. *Miconia* subsect. *Seriatiflorae*, a group known by inflorescences with flowers arranged in scorpioid branches. The new species is close to the widespread *M. fallax* DC. and *M. stenostachya* DC., sharing the petals with glandular-ciliolate margins and the anthers with connective appendages ventrally slightly bilobed. The distinctive characteristics are the indument of branches and abaxial surface of leaves: yellowish stellate in *M. astrocalyx* vs. whitish amorphous in the two other species; the calyx lobes larger (1.8-2 mm long. in fresh material, very deflexuous in dry material) in *M. astrocalyx* vs. 1.1-1.7 long in *M. fallax* and 0.8-0.9 long in *M. stenostachya*.

Other similar species from Cerrado with petals margins glandular-ciliolate is the poorly known *M. weddellii* Naudin from which *M. astrocalyx* is similar in the stellate indument and in the oblong leaves with round bases. However, *M. weddellii* has shorter and narrower inflorescences and leaves and antesepalous stamens anthers with skirtlike connective appendages plus a dorsal round projection.

Miconia herpetica DC. is another poorly collected species from this group and also occurs in Cerrados, from Bahia and Minas Gerais. It shares the yellowish stellate indument and leaf shape of *M. astrocalyx* but has petals with glabrous margins, stamens with skirtlike appendages and caducous calyx.

M. astrocalyx also resembles a remarkable species from Cerrado that has inflorescences with scorpioid branches, *M. ferruginata* DC. Furthermore they share the gnarled branches and the oblong leaves with stellate trichomes. Distinctive characteristics of *M. ferruginata* are:

noticeably larger and wider leaves, the glabrous petals margins, and the caducuous calyx lobes.

Acknowledgements

We are grateful to RELORA Program for funding the visit to K herbarium. The field trip and visit to HUEFS was supported by a PhD grant to JM and RG from CAPES-PNADB and the hospitality of Cristiane Snak. We are also grateful to Lisa Campbell and Dennis Stevenson for access to the SEM facilities at the New York Botanical Garden.

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Parte 4: ***Miconia rondoniensis*** Meirelles & R. Goldenb.

(Manuscrito submetido para publicação no peródico *Brittonia*)

Miconia rondoniensis (Melastomataceae: Miconieae): a new species from Brazilian Amazon

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During an ongoing phylogenetic and taxonomic studies in *Miconia* sect. *Miconia* subsect. *Seriatiflorae,* we found this new species among the undetermined material at INPA herbarium in Manaus, state of Amazonas, Brazil. Samples of fertile material were collected in state of Rondonia, what allowed us to include DNA sequences in a molecular phylogeny together to similar species. Additional specimens were also analysed in the herbaria K (under REFLORA Program), NY and US and confirmed this identity as a inedit species Here we describe and illustrate this new taxon.

Miconia rondoniensis Meirelles, Boelter & R.Goldenb., **sp. nov.** Type: Brazil. Rondônia: Porto Velho, Jaci-Paraná, Sítio do Antônio Basílio, 19 May 2012, *C.R. Boelter 460* (holotype: INPA; isotypes: NY, UEC, UPCB). (Figs. 1, 2, 3).

Tree 4-6m. Branches with the distal portions quadrangular, but terete when older., lacking interpetiolar ridges or lines. Branches, leaves, inflorescences and hypanthia densely covered with dendritic trichomes of mostly 5 types: (1) on branches and petioles the trichomes form a thick layer, and they have a long axis (up to 0.5mm long), with short arms (less than 0.1 mm) at its base, but inflated and devoided of arms at its apex, resulting in a sorus-like globose layered surface; (2) also on branches and petioles, and on the inflorescence branches and

main nerves on the abaxial leaf surface, the trichomes are similar to type (1), but the inflated axis apex does have arms, these gradually varying from short medium-sized (up to 0.15 mm long); (3) on the abaxial surface of the leaves the trichomes are flattenened, with very short axes and long arms (the trichomes ca. 0.3mm diam) and may be a little more sparser, sometimes not completely covering the surface; (4) on branch and inflorescence nodes there are tufts of trichomes with a thin and long axis (up to 0.7 mm long) and few short arms, mostly at their bases; (5) on the hypanthia the trichomes have shorter, but still broad axes, and short arms (the trichomes 0.15-0.2 mm diam.), and become more sparse on the fruits. Leaves opposite, isophyllous; petioles 1,8-4,7 cm long; blade 18-50 x 8-22 cm, firm-chartaceous, discolorous, mostly elliptic but seldom slightly obovate, base rounded to obtuse or subcordate but sometimes the distal leaves broadly acute, apex acuminate to abruptly acuminate, margins repand to shortly and remotely denticulate, nerves acrodromous, shortly suprabasal (the inner pair diverging 3-10 mm above the base), 5+2 (two pairs of robust laterals plus another fainter and submarginal pair), the three main nerves impressed on the adaxial surface, prominent on the abaxial surface, trichomes absent on the adaxial surface. Panicles 19-30 x 14-26 cm, terminal, with 11-19 pairs of secondary branches, the distal ones bifid, with each one of the two tertiary branches secund, the proximal carrying 2-10 pairs of tertiary branches, these in turn bifid, with quaternary branches secund; each one of the secund tertiary or quaternary branches 7-14 mm long; bracts 4-16 x ca. 1 mm, the larger linear, the smaller linear-oblong or linear-lanceolate; bracteoles ca. 2.1 x 1.3 mm, plane, hemi-elliptic, apex rounded, persistent at anthesis and subsequently along with the young fruits. Flowers sessile, 5(-6)merous. Hypanthium 1.8-2 mm long, campanulate, slightly costate. Calyx tube 0.7-0.9 mm, with longitudinal folds alternating with the lobes (later sometimes rupturing in the fruits); inner lobes broadly triangular, very short (0.1-0.2 mm longer than the tube); external teeth absent or reduced to a tuberculate projection. Petals 3,2 - 3,4 x 1,4 - 1,8 mm, white, obovate, apex slightly cucullate, rounded and denticulate, glabrous. Stamens 10(-12), white, slightly dimorphic; filaments 4.5 - 5 mm long (antesepalous) or 3.2 – 3.7 mm (antepetalous); connective 0.4 -0.7 mm prolonged below the thecae (in both whorls), appendages 2, clearly defined (not continuous and skirt-like), divergent and strongly ventrally projected, ca. 0.7 mm long, shortly oblong, apex rounded ou acute (antesep.) or 3, with one small (ca. 0.2 mm), dorsal, acute, and two ventral, larger (0.4-0.5 mm), the apex rounded, acute, or sometimes bilobed, this last case resulting in 5 apparent appendages (antepet.); anthers 1.6-2.3 mm long (antesep.) or 1.3-1.9 (antepet.), both oblong, straight, the apex

rounded (antesep.) or slightly emarginate (antepet.), the single pore ca. 0.3 mm diam., slightly ventrally inclined (antesep.) or apical (antepet.). Ovary ca. 1.5 mm long, ca. 1/2 inferior, 3(-4) celled, glabrous; style 5.6-7 mm long, straight, glabrous; stigma ca. 1 mm diam., expanded. Fruits 2-2.2 mm diam., globose. Seeds 14-21 per fruit, ca. 1mm long, pyramidal, testa cells jigsaw-type (following Martin & Michelangeli, 2009), plane or convex; raphal part covering 90% of seed length.

Distribution and ecology— Miconia rondoniensis occurs in Southern-Amazonian "Terra Firme" secondary rain forest (Floresta Ombrófila Densa Amazônica, following the official Brazilian classification of vegetation types; Veloso et al., 1991). It has been collected in the states of Rondonia and Amazonas.

Additional specimens examined: BRAZIL. Amazonas: Novo Aripuanã, 29 apr 1985, C.A. Cid Ferreira 5887 (INPA, NY, RB). **Rondônia**: Guajará-Mirim, 12 apr 1987, M. Nee 34794 (HFSL, INPA, MO, NY, SP, US); Porto Velho, estrada Porto-Velho - Rio Branco, km 20, 24 apr 2012, C.R. Boelter 433 (UEC); Porto Velho, Jaci-Paraná, 19 may 2012, C.R. Boelter 460 (INPA, NY, UEC, UPCB); Porto Velho, 21 may 2012, C.R. Boelter 461 (INPA, NY, UEC, UPCB)

Miconia rondoniensis belongs to *Miconia* sect. *Miconia* subsect *Seriatiflorae*, according to the infrageneric system proposed by Cogniaux (1891), based on Naudin (1851) and Triana (1871). This subsectional placement can be explained by the inflorescences with flowers on secund (scorpioid) branches, and the linear to oblong, 1-pored stamens, these with ventral appendages.

Despite the fact that the sections in *Miconia* and even the genus itself have been regarded as non-monophyletic (Goldenberg et al., 2008; Goldenberg et al., 2013), this group of plants in tribe Miconieae with apical inflorescences, discolorous leaves, abaxial surface with dense indument, and scorpioid or glomerulate inflorescences seems to be monophyletic (Caddah, 2013). In this clade, the inflorescence structure and characters related to trichomes seem to explain the relationships between different lineages within it (Caddah, 2012, Meirelles, in prep.).

Among the species in subsect. *Seriatiflorae*, *Miconia rondoniensis* is morphologically similar to *Miconia dispar* Benth. Both species are trees densely covered with dendritic, brownish trichomes all over the plant, and both also large leaves and inflorescences, persistent hemielliptic bracteoles, short calyx lobes and capitate or expanded stigmas. *Miconia dispar* differ from *M. rondoniensis* due to the non-globose trichomes on the branches and non-

flattened stellate trichomes on the abaxial surface of the leaf, these with 3+2 basal nerves (vs. 5+2 in *M. rondoniensis*) and acute to attenuate bases (vs. rounded to obtuse or subcordate in *M. rondoniensis*), and inflorescences with secund flowers on the tertiary branches in proximal paraclades or secondary branches in distal paraclades (vs. quaternary branches in proximal paraclades or tertiary branches in distal paraclades). The flowers of *M. dispar* are also slightly different, with deciduous calyx lobes (vs. persistent), and capitate stigmas (vs. expanded stigmas in *M. rondoniensis*).

Despite this morphological similarity, *M. rondoniensis* and *M. dispar* are not closely related (Meirelles et al., in prep.). A preliminary phylogenetic analysis based on six molecular markers suggests that *M. dispar* is more closely related to *M. ferruginata* DC. and *M. burchellii* Triana, while *M. rondoniensis* is actually closerly related to *M. valtherii* Naudin and *M. ruficalyx* Gleason. These three species share a stellate indument on leaf abaxial surface, inflorescences with scorpioid branches, persistent calyx and expanded to capitate stigmas. *Miconia valtherii* occurs exclusively on Brazilian Atlantic Forest, and differs from *M. rondoniensis* due to the absence of globose trichomes on branches, and shorter inflorescences, these with less branched paraclades. *Miconia ruficalyx Gleason* also occurs in Amazonian forests, but in this species the leaf abaxial surfaces are not completely covered by indument (the trichomes are sparsely to moderately distributed, keeping the epiderm still visible), and its inflorescences are smaller, with shorter and less branched paraclades.

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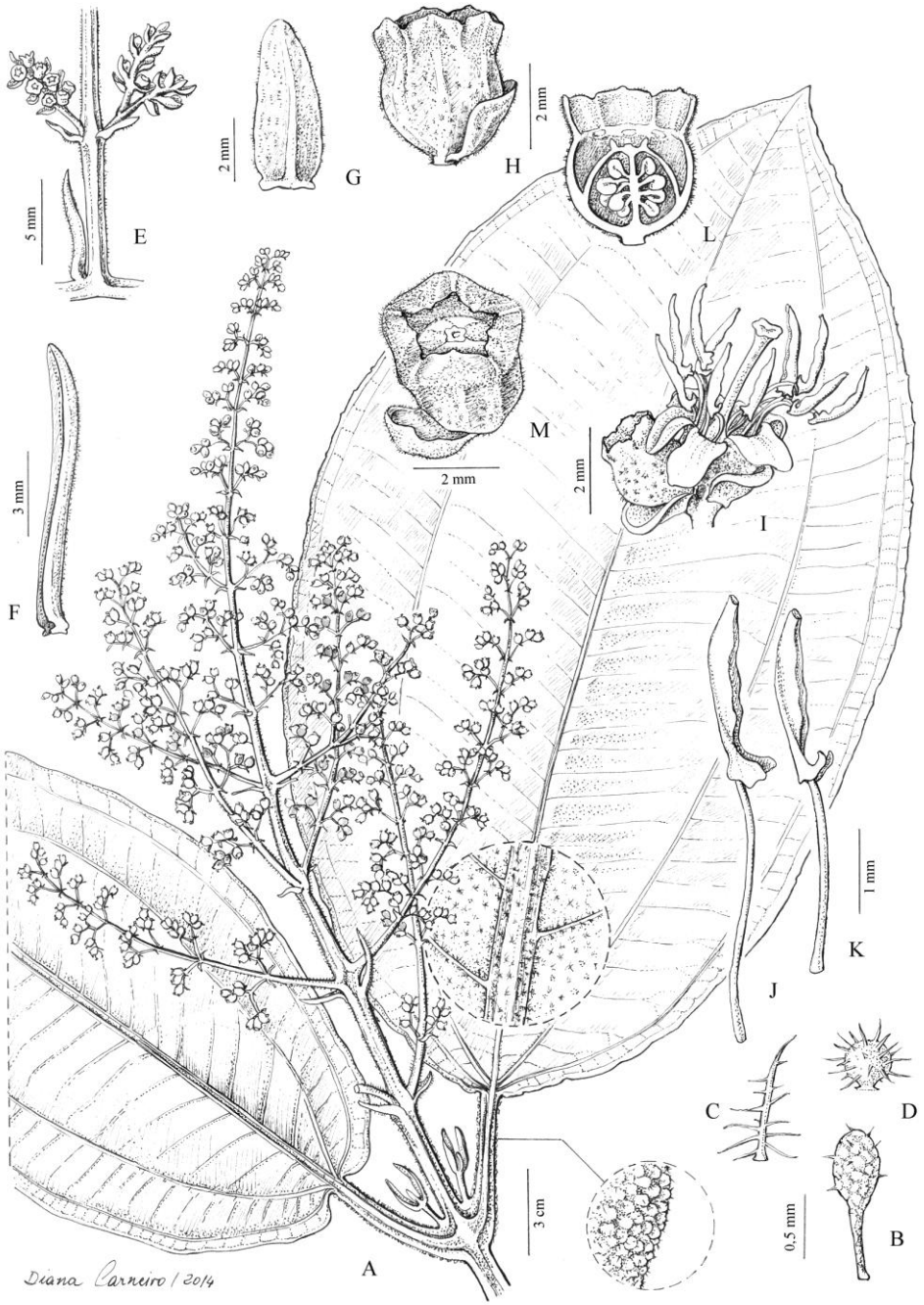

Fig 1. *Miconia rondoniensis* (from the holotype). A. Fertile branch. B. Trichome from a branch, with a long axis, short arms its base, but inflated (globose) and devoided of arms at its apex. C. Trichome from a stem node, with a thin and long axis and few short arms, mostly at their bases;. D. Trichome from the hypanthium, with short and broad axis, and short arms . E. Inflorescence branch. F. Proximal bract. G. Distal bract. H. Fruit and bracteole, lateral view. I. Flower. J. Antesepalous stamen. K. Antepetalous stamen. L. Fruit, longitudinal section. M. Fruit and bracteole, apical view.

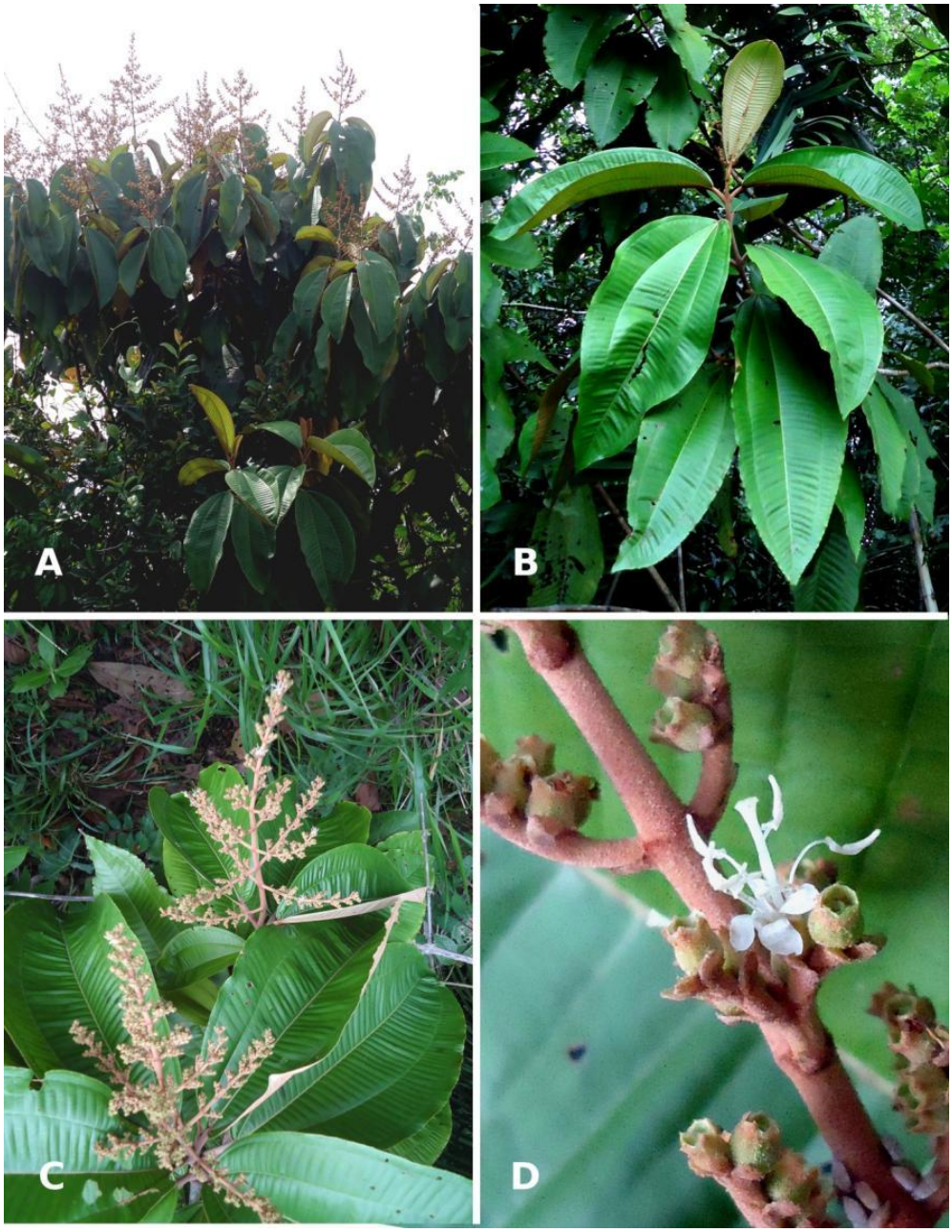

Fig 2. *Miconia rondoniensis* in its natural habitat. A. Treelet top. B. Branch with leaves. C. Inflorescences. D. Flower and young fruits.

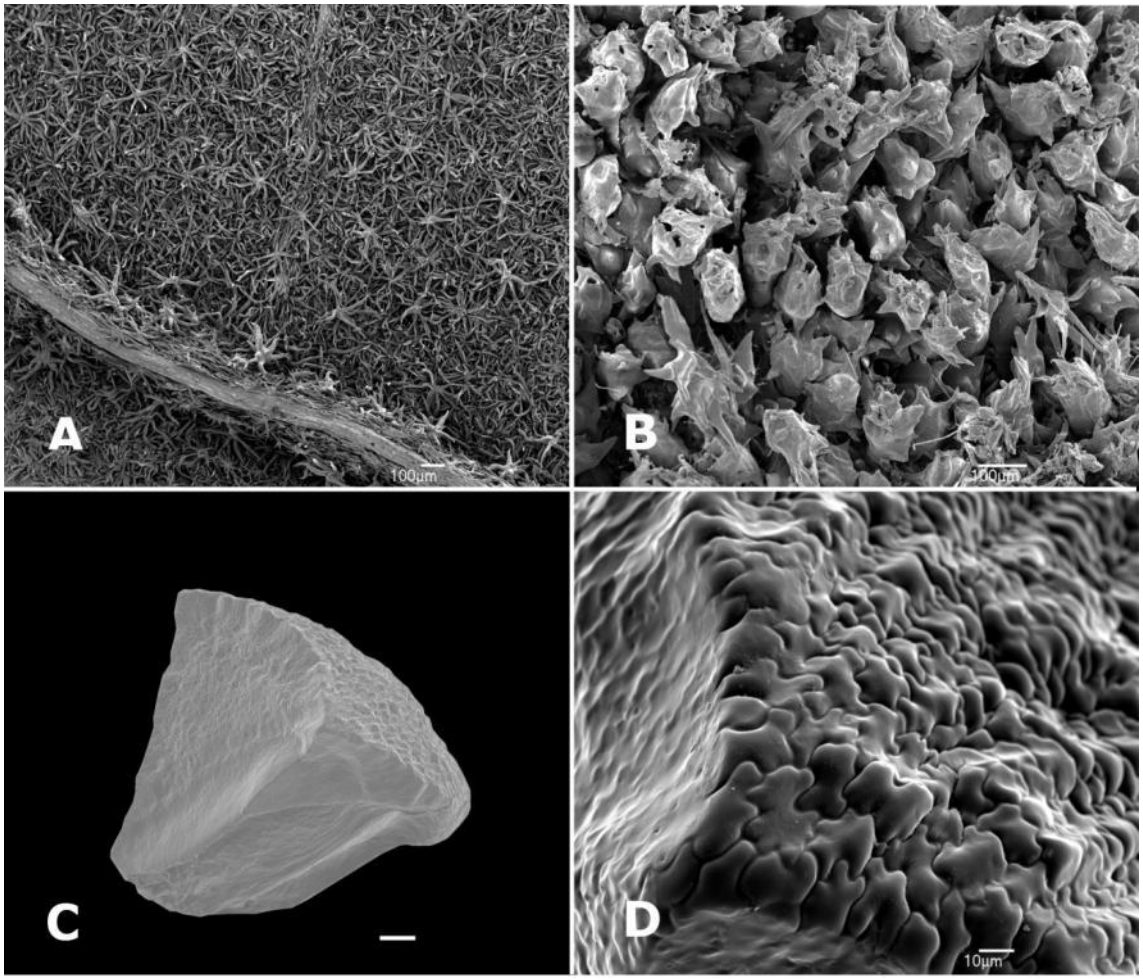

Fig. 3. *Miconia rondoniensis*: SEMs images. A. Trichomes on the abaxial surface of the leaf. B. Trichomes on the branches. C. Seed (scale bar:100 µm). D. Seed surface.

Capítulo III. Taxonomic revision of the *Miconia albicans* (Sw.) Steud. clade (Melastomataceae, Miconieae)

(Manuscrito preparado nas normas do peródico periódico Phytotaxa)

Título. **Taxonomic revision of *Miconia albicans* (Sw.) Steud. clade (Melastomataceae, Miconieae)**

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Abstract

With more than a thousand species, *Miconia* is one of the largest neotropical plant genera. However, recent phylogenetic analyses have shown the genus is artificial, as well as its sections and subsections, which corroborates the necessity of a new taxonomic delimitation for the tribe Miconieae. This work presents a taxonomic treatment of the 18 species in the albicans clade, characterized by their shrubby to treelet habit, discolorous leaves with abaxial surface covered by amorphous trichomes and inflorescences with secundiflorous and scorpioid branches. These species are either widely distributed from Mexico to Paraguay, or endemic to the Amazon. For this monograph, more than 2500 herbarium sheets were analyzed from 18 herbaria in Brazil and abroad (BR, G, G-DC, HUEFS, IAN, INPA, JOI, K, M, MBM, MG, NY, P, RB, UEC, UPCB, US, W). Four new species were discovered (*M. astrocalyx*, *M. macuxi*, *M. suberosa*) and the status of *M. argyrophylla* subsp. *gracilis* is changed and a new name for this taxon (*M. mayarae*) is proposed. Two new synonyms were established, *M. cinerea* under *M. stenostachya* and *M. nambyquarae* under *M. herpetica*. This work also provides an identification key to the species, descriptions, a complete list of examined material, distribution maps, illustrations, images, comments about the species and lectotypifications.

Resumo

Com mais de mil espécies, *Miconia* é um dos o maiores gênero de plantas Neotropicais. Entretanto, as análises filogenéticas recentes evidenciam sua artificialidade, bem como das suas seções e subseções. Consequentemente, faz-se necessária uma nova delimitação taxonômica para a tribo Miconieae como um todo. Apresentamos aqui o tratamento taxonômico das 18 espécies do clado albicans , todas com hábito arbustivo a arbóreo, folhas discolores com superfície abaxial recoberta por tricomas amorfos e inflorescências com ramos secundifloros e escorpióides. São espécies amplamente distribuídas desde o México ao Paraguai, ou endêmicas da Amazônia. Para tanto, foram analisadas mais de 2500 exsicatas em 18 herbários no Brasil e no exterior (BR, G, G-DC, HUEFS, IAN, INPA, JOI, K, M, MBM, MG, NY, P, RB, UEC, UPCB, US, W). Quatro novas espécies foram descobertas: *M. astrocalyx*, *M. macuxi*, *M. suberosa* e foi também reconhecida a mudança de status de *M. argyrophylla* subsp. *gracilis* e proposto um novo nome, *M. mayarae*. Duas novas sinonímias foram estabelecidas: *M. cinerea* sob *M. stenostachya*, e *M. nambyquarae* sob *M. herpetica*. São apresentadas chave de identificação das espécies, descrições, lista completa de materiais examinados, mapas de distribuição geográfica, ilustrações, imagens, comentários das espécies e lectotipificações.

Introduction and Taxonomic History

The genus *Miconia* was described by Ruiz and Pavón in 1794 with only three species. As a generic name, *Miconia* was conserved against *Tamonea* Aubl., *Leonicenia* Scopoli, *Lieutatia* Buchoz and *Zulatia* Necker (Farr et al. 1979 *apud* Goldenberg et al. 2013). Today it comprises about 1088 accepted species, including 1057 listed in Goldenberg at al. (2013) and over thirty new or recently transferred species.

Half a century after the publication of the genus, Naudin (1850) proposed the first infrageneric classification, which was the base of subsequent classifications by Triana (1871) and Cogniaux (1891). Cogniaux (1891) divided *Miconia* into the following ten sections (cited as subgenera): *Adenodesma*, *Amblyarrhena*, *Arrhenotoma*, *Chaenanthera*, *Cremanium*, *Diplochita*, *Hartigia Jucunda*, *Laceraria* and, (Eu) *Miconia*. Section (Eu) *Miconia* was divided into seven subsections: *Aplostachyae*, *Diplostachyae*, *Impetiolaris*, *Glomeratiflorae*, *Paniculares*, *Seriatiflorae* and *Stenostachyae.* In Naudin's work, the *Seriatiflorae* group was delimited as a subsection for the first time, which can be diagnostically characterized by its inflorescences that are pyramidal panicles, or elongated, with bifid or trifid primary branches and secundiflorous secondary or tertiary branches. Naudin included fifteen names in this subsection: *M. anceps* Naudin, *M. argyrophylla* DC., *M. bracteolaris* Naudin, *M. detergibilis* DC., *M. holosericea* DC., *M. goudotii* Naudin, *M. lacera* (Bonpl.) Naudin, *M. lepidota* DC., *M. longifolia* (Aubl.) DC., *M. longistyla* DC., *M. racemosa* (Aubl.) DC., *M. valtherii* Naudin, *M. serialis* DC., *M. tiliifolia* Naudin and *M. triseriata* Naudin.

Subsequently, the following names changed taxonomic positions within the genus or were synonymized under other names: *M. longifolia* and *M. valtherii* are currently in *Miconia* sect. *Glossocentrum*; *M. lacera* and *M. racemosa* are currently in section *Hartigia*; *M. holosericea* is currently in sect. *Jucunda*; *M. anceps* was synonymized under *M. trinervia* Cogn., *M. bracteolaris* under *M. eriodonta* DC., *M. detergibilis* under *M. albicans*, *M. longistyla* under *M. argyrophylla*, *Miconia triseriata* under *M. ferruginata* DC.; and *Miconia albicans, M. argyrophylla*, *M. eriodonta*, *M. ferruginata, M. goudotii*, *M. lepidota*, *M. serialis*, *M. tiliifolia* and *M. trinervia* are currently in *Miconia* sect. *Miconia*.

Triana (1871) classified the species in *Miconia* using mainly anther, hypanthium and calyx shape. His infrageneric classification resulted in the ten following sections: *Amblyarrhena*, *Chaenopleura*, *Cremanium*, *Diplochita*, *Eumiconia*, *Glossocentrum*,

Hypoxanthus, *Jucunda*, *Laceraria* and *Octomeris*. New species, with or without scorpioid inflorescences, were described by Triana and included in the section (Eu) *Miconia*: *M. amoena* Triana, *M. burchellii* Triana, *M. compressa* Triana, *M. crassipes* Triana, *M. glaucescens* Triana, *M. heliotropoides* Triana, *M. magdalenae* Triana, *M. membranacea* Triana, *M. pauciflora* Triana, *M. pterocaulon* Triana and *M. riparia* Triana.

In this work the group of species from subsection *Seriatiflorae* was classified inside sect. (Eu) *Miconia*, together with other species (Triana´s "b" group) that share dense indument on the abaxial surface of leaves, which are the following: *M. albicans*, *M. amoena*, *M. aplostachya*, *M. argentea* (Sw.) DC., *M. argyrophylla*, *M. aulocalyx* Mart., *M. burchellii*, *M. compressa*, *M. crassipes*, *M. discolor* DC., *M. glaucescens*, *M. goudotii*, *M. fallax*, *M. ferruginata*, *M. heliotropoides*, *M. herpetica* DC., *M. lepidota*, *M. longispicata*, *M. macrothyrsa* Benth., *M. magdalenae*,*M. membranacea*, *M. organensis* Gardner, *M. pauciflora*, *M. pterocaulon*, *M. punctata* (Desr.) D. Don., *M. riparia M. serialis*, *M. scorpioides* Schletcht., *M. spicellata* Bonpl., *M. stenostachya* DC., *M. tiliaefolia* and *M. weddellii*.

The most recent complete monograph of *Miconia* was published by Cogniaux in 1891. However, at that time the genus only had 518 accepted species, around half of what it has today. Cogniaux (1891) characterized sect. *Miconia* based on stamen morphology. According to his identification key, the species in sect. *Miconia* have short anthers with an attenuate apex that are dehiscent by one or two pores. The stamen connective is basally biauriculate or biappendiculate. The subsection *Seriatiflorae* was characterized by its paniculate inflorescences, with secundiflorus, bifid or trifid branches, and included the following 31 names (actually 27 species): *Miconia albicans*, *M. ambigua* DC., *M. argentea*, *M. argyrophylla*, *M. cinerea* Cogn., *M. discolor*, *M. dispar* Benth., *M. eriodonta*, *M. fallax* DC., *M. ferruginata* DC., *M. glazioviana* Cogn., *M. goudotii* Naud., *M. heliotropoides*, *M. herpetica* DC., *M. laevigata* , *M. lepidota*, *M. macrothyrsa*, *M. pennipilis* Cogn., *M. polyandra* Gardn., *M. pterocaulon* Triana, *M. pulchra* Cogn., *M. punctata*, *M. sagotiana* Cogn., *M. secundiflora* Cogn., *M. scorpioides* Naud., *M. serialis* DC., *M. stenostachya* DC., *M. tiliaefolia* Naud., *M. tomentella* Cogn., *M. trinervia* (Sw.) Don ex Loud. and *M. virescens* (Vahl) Triana. Several of these taxa were later synonymized and new species were also described.

In the last century many *Miconia* species have been described. *Miconia nambyquarae* Hoehne was published in 1922 based on its indument, narrow 3-nerved leaves (less often 5-nerved) and inflorescences that reach 20 cm long (based on the type material collected in the state of Mato Grosso, Brazil).

New species were also discovered and published by Wurdack, who greatly contributed to what is known about the taxonomy of Melastomataceae. *Miconia navioensis* Wurdack and *M. argyrophylla* subsp. *gracilis*, published in 1961, were described from specimens collected in Amapá State in the North Region of Brazil. *Miconia lourteigiana* Wurdack, which was published in 1970, was described based on specimens from Peru.

The works by Goldenberg (2000) and Goldenberg et al. (2013) did not change the infrageneric classification of *Miconia*. However, they are relevant contributions to understanding the genus and include a list of species that are presently accepted, as well as information about their respective sections, synonyms and geographic distributions.

In the preliminary molecular phylogeny of *Miconia,* some species from subsect. *Seriatiflorae* were sampled and formed three monophyletic groups, with some other species, inside a larger clade named Miconia IV (Goldenberg *et al.,* 2008). The first group had *M. lepidota*, *M. Multispicata*, *M. polyandra* and *M. valtheri* Naudin, the second group had *M. chrysophylla* (Rich) Urb., *M. elata* (Sw.) DC., *M. longifolia* (Aubl.) DC., *M. punctata*, and *M. rufescens*, and the third group had *M. albicans*, *M. alborufescens* Naudin, *M. argyrophylla*, *M. hypoleuca* (Benth.) Triana and *M. stenostachya*. In addition, some species from sections *Glossocentrum* (*M. alborufescens* and *M. valtherii*) and *Hypoxanthus* (*M. chrysophylla* and *M. hypoleuca*) were close to the species in sect. *Miconia* subsect. *Seriatiflorae* (Goldenberg *et al.,* 2008).

Posteriorly, the *Seriatifloreae* species were shown to be sister to the sect. *Glossocentrum* species. Based on this, a new infrageneric classification was created and included the creation of sect. *Discolor* and its four subsects., *Albicans*, *Chrysophylla, Multispicata* and *Discolor*, which comprises the *Glossocentrum* species that occur mostly in southeastern Brazil (Caddah, 2013).

The first subsection represents the *M. albicans* clade, with species that have amorphous indument and thyrsoid inflorescences with bifid or trifid, scorpioid branches. The second subsection represents the *M. chrysophylla* clade, with species that have an indument of

stellate-lepidote trichomes and inflorescences that are paniculate with scorpioid branches. The third subsection represents the *M. discolor* clade, with species that have an indumenta of branched trichomes (stellate or dendritic) and glomerulate inflorescences. The fourth subsection represents the *M. multispicata* clade and comprises species with stellate or stellate-stipitate trichomes and inflorescences that are thyrsoid or panicles with scorpioid branches.

Since this work began in 2011, four new species from the albicans clade have been discovered. The first was found in the INPA herbarium in 2011. Thirty-eight years after the last time it was collected, this inedit species was found in the field in the municipality of Borba, Amazonas State, Brazil. The fresh material allowed us to include it in the molecular phylogeny of the group, which confirmed the placement of this species in the albicans clade. *Miconia suberosa* Meirelles & Goldenberg was published in 2014 (Meirelles & Goldenberg 2014). The second new species, *Miconia macuxi* Meirelles, Caddah & R. Goldenb., was published in 2015 (Meirelles et al. 2015) The third new species is being prepared for publication (*Miconia astrocalyx* Meirelles & R. Goldenb.). The fourth new species will result from the new status and new name for *M. argyrophylla* subsp. *gracilis* Wurdack. Based on the present work and the phylogenetic study, this subspecies will be promoted to species level and named *M. mayarae* (Meirelles & Golenberg *in prep*).

Materials and Methods

In order to delimitate the group of interest, we first listed all the species from subsect. *Seriatiflorae* Naudin (1850) and included species that were near them in previous molecular phylogenetic analyses (Michelangeli *et al.* 2004, Goldenberg *et al.* 2008, Caddah 2013). To obtain additional species and describe the new species, six field trips were made in Brazil (Manaus-AM, Borba-AM, São Gabriel da Cachoeira-AM, Caracaraí-RR, Santarém-PA, Rio de Contas-BA). The type specimens for the new species were deposited in the herbaria of states where the collection was made and in the main Brazilian herbaria. Specimens or images of the types of almost all the species and their taxonomic synonyms were analyzed.

For the analysis and description of the morphological characters, material that was in a better state of conservation, or had plenty of flowers and fruits, was selected. Dried material was used to analyze vegetative characters. Flower part measurements were obtained after rehydrating flowers by boiling them for about one minute in water with a drop of common

soap. Aspects related to color were observed in the field. The measurements were taken with a digital caliper. Scanning electron microscopy (SEM) images were used to analyze micromorphological characters, such as details of the indument and seeds. Analyses of leaf samples and seeds were made with an SEM at the Structural Botany laboratory at The New York Botanical Garden (NYBG) between November 2012 and May 2013. For this procedure, leaf fragments around ca. 5 mm² were used. These were fixed to metal stubs with double face adhesive tape, stained with gold palladium and analyzed with a JEOL scanning electron microscope. The images of flower parts used in the illustrations of diagnostic characters were taken using a Nikon SMZ1500 stereoscopic microscope equipped with a Nikon DXM1200F camera.

More than 2500 exsiccatae were studied from 18 herbaria in Brazil and other countries (BR, G, G-DC, HUEFS, IAN, INPA, JOI, K, M, MBM, MG, NY, P, RB, UEC, UPCB, US, W). For *M. albicans* and *M. stenostachya,* which are widely distributed and commonly collected, only the specimens examined at NY and US are listed; vouchers examined from other herbaria are only listed if NY or US did not have records for a region where the species occurs.

Results and Discussion

The albicans clade

Shrubs, treelets to trees 0.3-18 m high. Opposite decussate leaves, discolorous with the abaxial surface densely covered by amorphous trichomes, sometimes stellate or dendritic. Leaf with petiole 0.2 – 4.5 (7) cm long., blade 2.5-16 (47.5) x (1.2) 2.6 - 20 cm, rounded apex, acute, acuminate or caudate, margin entire to slightly crenulate in the superior half, base obtuse, cordulate to acute. Flowers 4-5-meras, radial, perigynous, diplostemonous; hypanthium campanulate; double calyx, lobes triangulars with conspicuous or non conspicuous teeth, persistent or caducous in fruit; petals white, free, obovate, appex rounded, retuse or eroded, margins glabrous or ciliate-glandular; stamens 10, dimorphic, filaments 1.4 – 4.9 mm long., white, glabrous, anthers (1) 1.3 x 4.9 mm long., white or yellow (turning to red after polinization), oblong, connective from not prolonged bellow the thecae to 1.1 mm long. prolonged, connective appendages absent or present, ventrally bilobed and with a dorsal projection, with a skirt-like shape that involves the insertion of filaments in thecae, or

cordiform, pore apical unique ca. 0.2 mm diam., or ventrally expanded pore ca. 0.5 mm compr. (*M. navioensis*), wide ventral slit ca. 1 mm diâm. (*M. hypoleuca*); style 3.2 - 10 mm long., white, straight or curve, glabrous to sparsely covered by glandular trichomes, stigma punctiform, truncate to slightly capitate, ovary semi-inferior (1/2 a 2/3 inferior), apex glabrous to sparsely covered by stellate trichomes. Fruits baccate 2.1 - 6.7 mm diâm., green when immature and Orange to jade green, blue, purple or reddish when ripe; seeds piramidal to rounded, (4) 10 - 45 (77) by fruit.

Distribution and habitat (Fig. 1):—The species in the albicans clade occur from Central America and the Caribbean to Paraguay. They grow in the understory of tropical forests (Amazon and Atlantic Forest), including along the edges of these vegetations. Species in the clade also occur in cerrado, rocky fields and disturbed areas, such as roadsides. The Amazonian species occur mainly in open vegetation, for example, campinas where there is grass, trees and shrubs growing on white-sand soils poor in nutrients, and a high level of endemism. The group is also common in the Gran Sabana, in Venezuela, and around the Guiana Shield.

Included species (18): *Miconia albicans* (Sw.) Steud., *M. alborufescens* Naudin, *M. argyrophylla* DC., *M. astrocalyx* Meirelles *et al.*, *M. fallax* DC., *M. herpetica* DC., *M. hypoleuca* Triana, *M. longispicata* Triana, *M. lourteigiana* Wurdack, *M. macuxi* Meirelles *et al.*, *M. mayarae Meirelles & R. Goldenb.*, *M. navioensis* Wurdack, *M. pterocaulon* Triana, *M. secundiflora* Cogn., *M. serialis* DC., *M. stenostachya* DC., *M. suberosa* Meirelles & R. Goldenb. and *M. weddellii* Naudin.

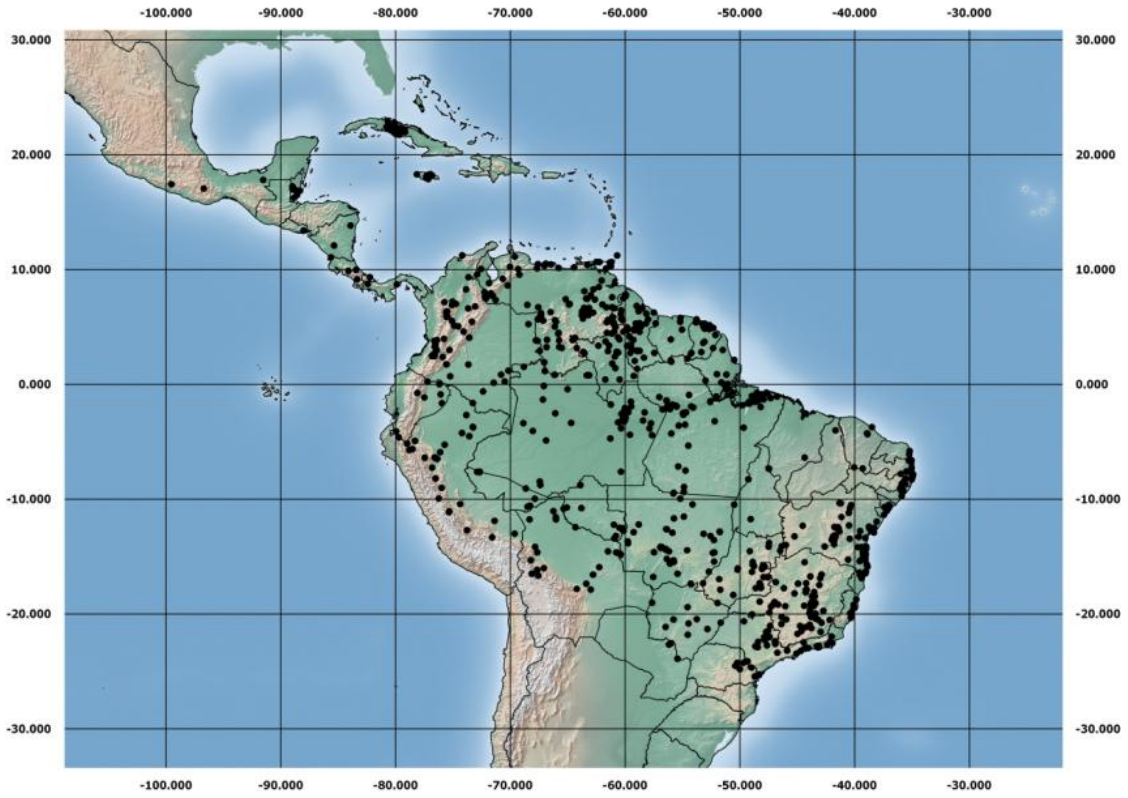

FIGURE 1: Distribution of the species of *Miconia albicans* clade.

Morphological synapomorphies: chartaceous leaves; amorphous indument formed by densely grouped trichomes on the branches, petioles, abaxial surface of blades, inflorescences and hypanthium; distal inflorescence branches secund, scorpioid; petals glandular-ciliolate in the fallax subclade; connectives prolonged below the thecae in the albicans subclade.

Recognition among related groups: Indument type is the main morphological character used to distinguish the albicans, chrysophylla, discolor and multispicata clades. The albicans clade is characterized by indument composed of amorphous trichomes; the chrysophylla clade has stellate-lepidote trichomes with a well-marked central point; the discolor clade is characterized by stellate or dendritic trichomes; and most species of the multispicata clade have stellate trichomes that sparsely to moderately cover the branches, petioles and abaxial surface of the blades.

HABIT

The species in the albicans clade are shrubs and trees between 30 cm and 18 m tall. In general, the shrubs occur in open vegetation, such as fields and cerrado (e.g., *M. albicans*, *M. alborufescens, M. astrocalyx*, *M. fallax, M. herpetica*, *M. stenostachya* and *M. weddellii*), as well as in campinas and savanas around the Guiana Shield (*M. albicans*, *M. alborufescens, M. fallax, M. macuxi, M. stenostachya*). Species that are treelets and trees occur predominantly inside campinaranas and forest in the Amazon region (e.g., *M. argyrophylla*, *M. longispicata, M. lourteigiana, M. mayarae, M. navioensis, M. pterocaulon* and *M. suberosa*) and in the Atlantic Forest (*M. hypoleuca* and occasionally *M. albicans*).

INDUMENT

Species in the albicans clade always have a dense indument that continuously covers the surface of branches, petioles, and abaxial blade surface. In general, it is possible to differentiate between the trichomes on the central vein and the surface of the blade. In most species studied, the indument on the branches, petioles, blade surface, inflorescence and hypanthium is composed of non-individualized trichomes that are, arachnoid and cylindric spirulate or tangled and flattened (ver Wurdack 1986; Figures 2, 3, 4, 5, 6, 7). However, some species have an indument of very dense stellate trichomes, as found in *M. astrocalyx* (Fig. 4 A–B), *M. herpetica* (Fig. 4 E–F), *M. longispicata* (Fig. 5 A–B), *M. suberosa* (Fig. 6 G–H), *M. macuxi* (Fig. 7 A–B) and *M. weddellii.* In the clade, as in Melastomataceae in general, indument is an important taxonomic characteristic that is very useful for species recognition. *Miconia suberosa* is the only species in the group that has dendritic trichomes with short arms that, at first sight, can appear to be simple trichomes.

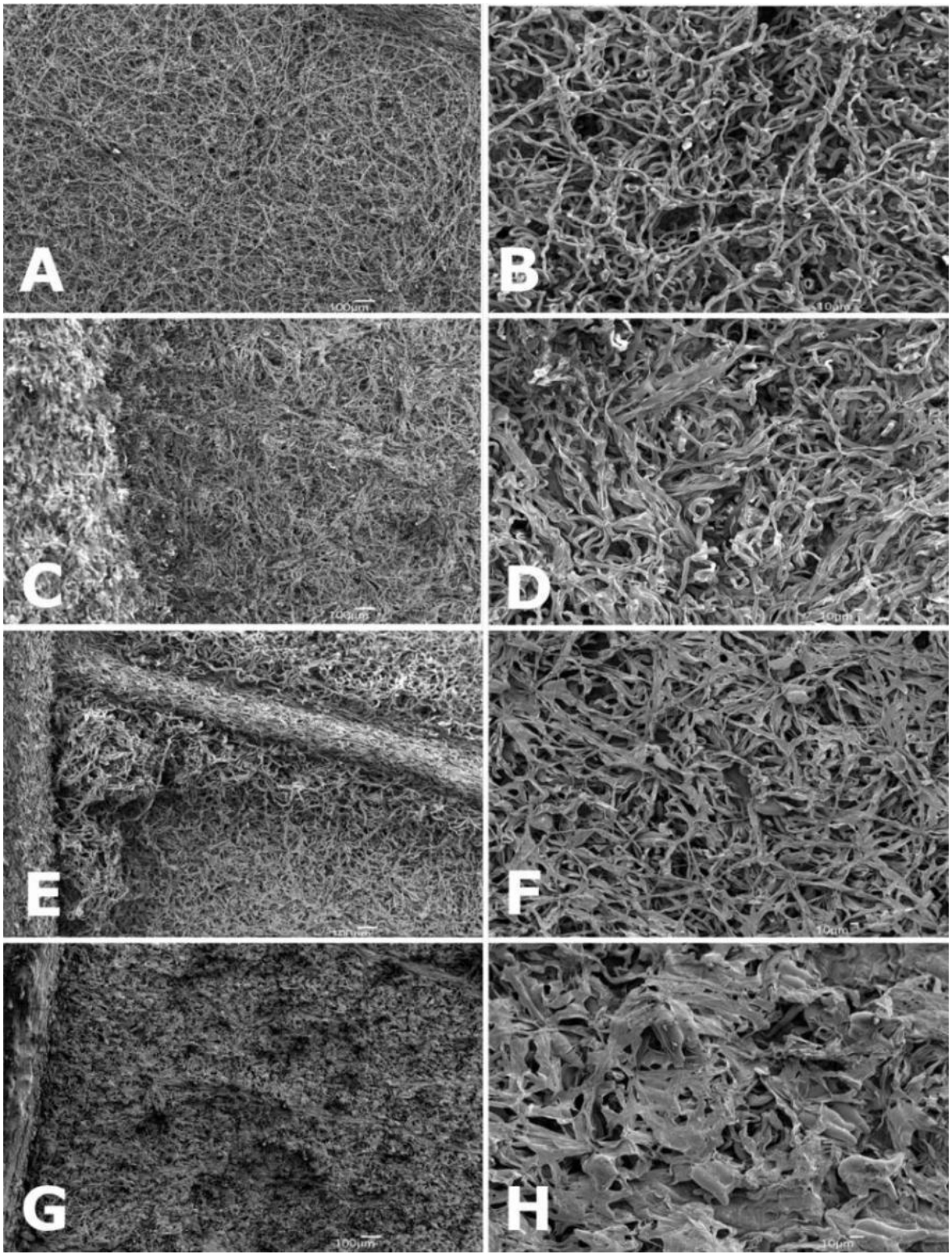

FIGURE 2: SEM of indument from abaxial surface of leaves in the albicans clade. A-B. *Miconia albicans* (*Heringer 93*, NY). C- D. *M. alborufescens* (*Queiroz 5337*, NY). E-F. *M. argyrophylla* (*Prance 14901*, NY). G-H. *M. mayarae* (*Rosa 1777*, NY).

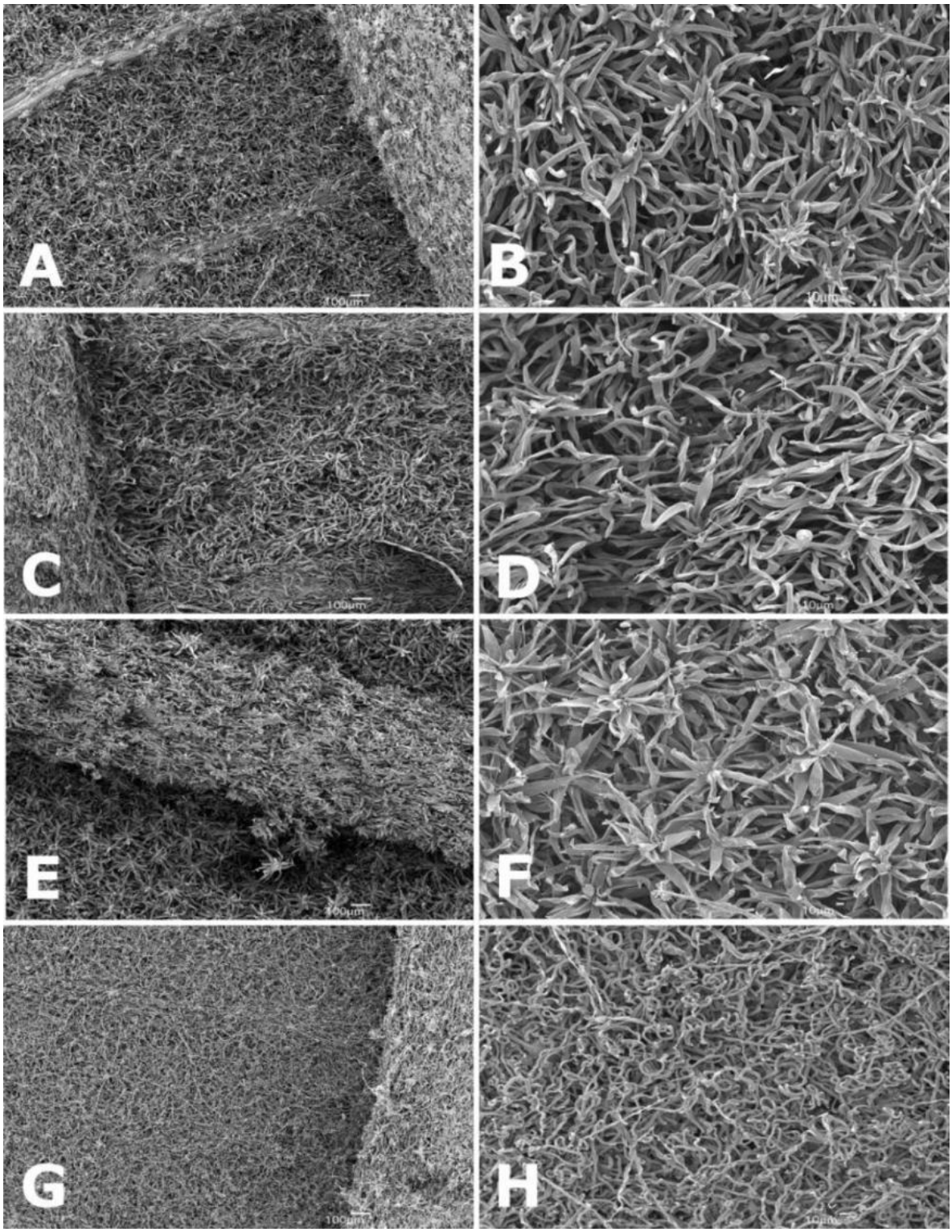

FIGURE 3: SEM of indument from abaxial surface of leaves in the albicans clade. A-B. *Miconia astrocalyx* (*Hatschbach 39074*, US). C- D. *M. fallax* (*Jansen-Jacobs 1047*, NY). E-F. *M. herpetica* (*Sant´Ana 1283*, NY). G-H. *M. hypoleuca* (*Thomas 11056*, NY).

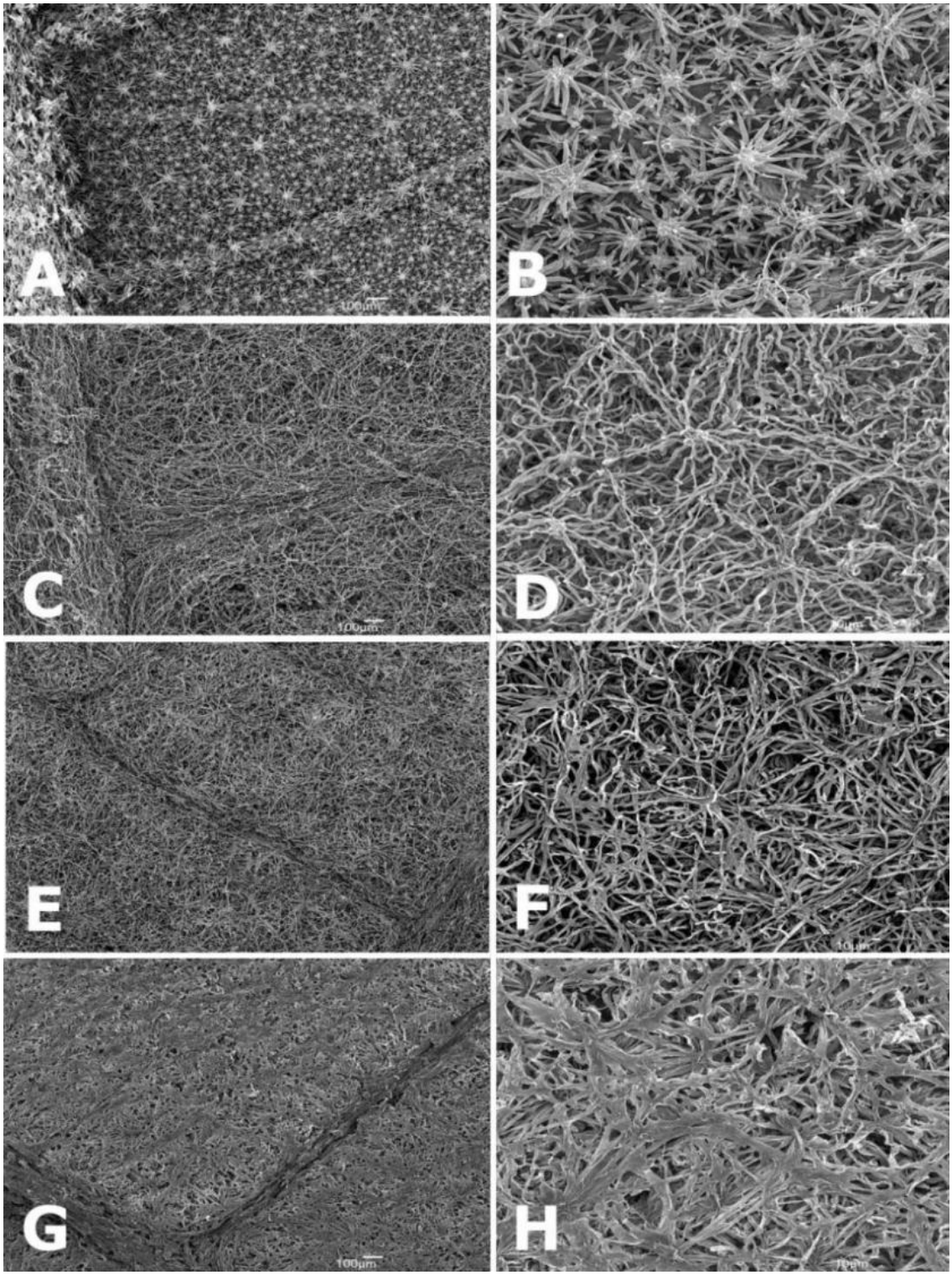

FIGURE 4: SEM of indument from abaxial surface of leaves in the albicans clade. A-B. *Miconia longispicata* (*Ramos 373*, NY). C- D. *M. lourteigiana* (*Quinet 1324*, NY). E-F. *M. navioensis* (*Meirelles 900*, NY). G-H. *M. pterocaulon* (*Coello 62*, NY).

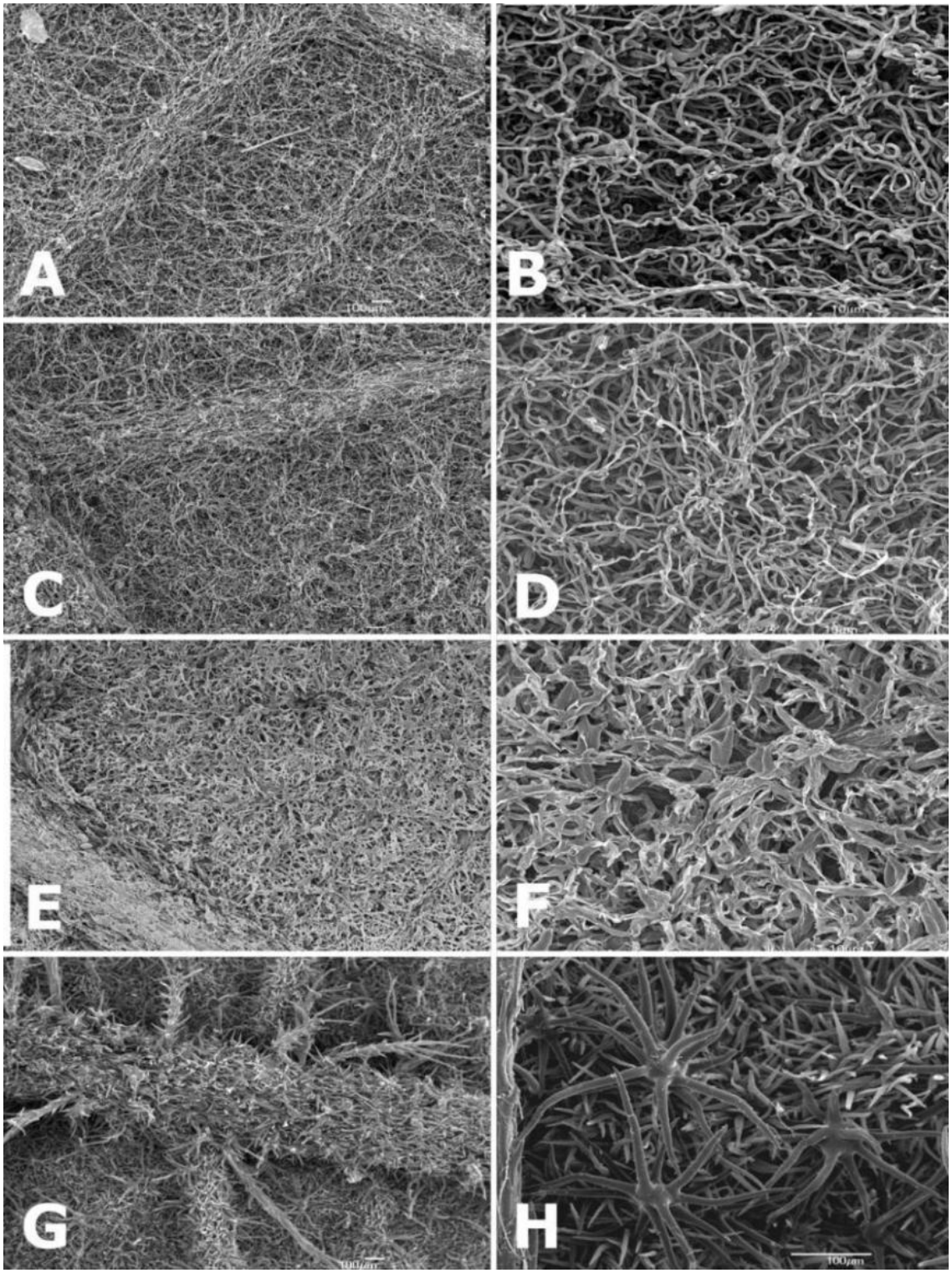

FIGURE 5: SEM of indument from abaxial surface of leaves in the albicans clade. A-B. *Miconia secundiflora* (*Meirelles 875*, NY). C- D. *M. serialis* (*Rodal 748*, NY). E-F. *M. stenostachya* (*Prance 9252*, NY). G-H. *M. suberosa* (*Meirelles 795*, UPCB).

FIGURE 6: SEM of indument from abaxial surface of leaves in the albicans clade.. A-B. *Miconia macuxi* (*Caddah & Meirelles 900*, NY).

BRANCHES

The studied species have cylindric, flattened to quadrangular and winged branches. The winged branches of *Miconia pterocaulon* are a very distinctive characteristic. The young branches of *M. argyrophylla* (sister species of *M. pterocaulon*) are conspicuously quadrangular and the older branches of this species have four vertical grooves. *Miconia astrocalyx* has crooked branches.

ANT DOMATIA

Miconia suberosa is the only species in the albicans clade that has domatia on the stems. The domatia are circular holes in the bark of the stems that are inhabited by ants in the genus *Pheidole* (Meirelles & Goldenberg 2014). Only four species of *Miconia* are known to be myrmecophytes (Michelangeli 2010), but they are not phylogenetically or morphologically related to *M. suberosa*. Among the other species studied in herbaria and in the field, none have leaf domatia, acarodomatia, or other types of domatia associated with ants.

LEAVES

The leaves in the albicans clade are almost always petiolate, except for *Miconia secundiflora* and *M. serialis* that have sessile leaves, and *M. fallax* that has sessile to subsessile leaves. The leaves always have opposite, decussate phyllotaxy. They are

conspicuously discolorous in all the species, the adaxial surface is shiny green to grayish or whitish (young leaves covered with indument) and the abaxial surface is often yellowish or grayish, depending on indument. Leaf size is quite variable. The Amazonian species have the largest leaves in the group, for example, *M. suberosa*, *M. argyrophylla* and *M. longispicata*. The base of the blade varies, for example, it can be decurrent (*M. serialis*), auriculate (*M. secundiflora*), acute (*M. mayarae*), cordulate (*M. albicans, M. alborufescens* and *M. astrocalyx*), rounded (*M. macuxi*) or obtuse (*M. suberosa*). The blade margin is often smooth, entire and glabrous, only *M. secundiflora* and *M. suberosa* have a ciliate margin. The blade apex varies from rounded (*M. albicans*) to caudate (*M. argyrophylla* and *M. mayarae*). The veins are basally inserted to shortly suprabasal.

INFLORESCENCES

According to Weberling (1988), Melastomataceae species are monotelic, in other words, the main axes ends in a flower. The basic shapes of inflorescence branching in most species in *Miconia* is pleiothyrsoid, diplothyrsoid or even monothyrsoid (Weberling 1988). Krasser (1893) *apud* Webberling (1988) cited helicoidal cymes for *Miconia secundiflora* Cogn. The position and classification of inflorescences have been very useful as diagnostic characters for the genus and species groups in Melastomataceae (ex. Wurdack 1962). Subsection *Seriatiflorae* was delimited by Naudin (1850) based on its species with inflorescences with scorpioid branches. Recently, a phylogenetic hypothesis was proposed stating that scorpioid inflorescences could have preceded the glomerulate inflorescence in the evolutionary history of the genus (Caddah 2013). In the albicans clade, the species predominantly possess thyrsoid inflorescences (sensu Weberling 1988). Although some exceptions may occur, such as *M. longispicata* (Fig. 7 D) that has a spikelet inflorescence (with sessile glomerulate flowers) and *M. alborufescens*, *M. hypoleuca* and *M. suberosa* that have wider panicles.

Some species have pyramidal inflorescences with thickened central axes and lateral branches that are wider at the base and gradually shorter as they approach the apex (Fig. 7 B). The last branches can be glomerulate or subscorpioid (e.g., *M. alborufescens*, *M. herpetica* and *M. suberosa*).

FIGURE 7: Inflorescences in the albicans clade. A. Thyrse with scorpioide branches and secund flowers (*M. navioensis*). B. Panicle with scorpioid distal branches (*M. alborufescens*). C. Panicle with dichasial distal branches (*M. hypoleuca*). D. Spiciform glomerulate (*M. longispicata*).

FLOWERS

The flowers in albicans clade are radial (or sometimes with a zygomorphic androecium), bisexual, have a calyx and corolla, and are diplostemonous and perigynous. The hypanthium is campanulate and covered externally with the same indument found on young branches and inflorescences. The double calyx is connate, and sometimes with external conspicuous teeth. The shape of calyx lobes is more or less triangular to truncate.

FIGURE 8: A-N: Diversity of flowers in albicans clade. A. *M. argyrophylla*. B. *M. mayarae*. C. *M. hypoleuca*. D. *M. weddellii*. E. *M. albicans*. F. *M. alborufescens*. G. *M. navioensis*. H. *M. longispicata*. I. *M. lourteigiana*. J. *M. secundiflora*. K. *M. serialis*. L. *M. fallax.* M. *M. stenostachya.* N. *M. herpetica*. Bar: 2 mm.

PETALS

The petals are free, white, and obovate to oblong with a round to retuse apex. Petals differ between the two main groups (subclades). The first has species with petals with

glabrous margins (albicans subclade, Fig. 9 B), and in the second the petals of the species have glandular-stipitate trichomes (fallax subclade).

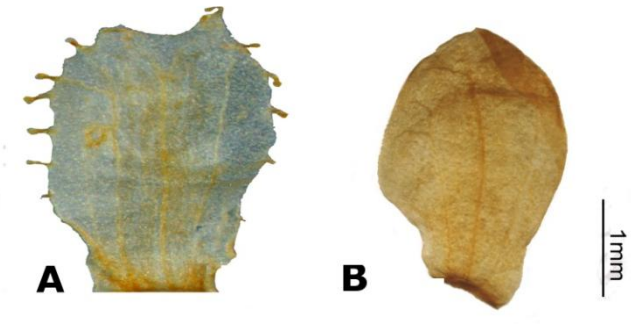

FIGURE 9: Petals. A. Glandular-ciliate margin (*M. argyrophylla Steyermark 124353,* NY). B. Glabrous margin (*M. albicans Rimachi 4066,* NY).

STAMENS

Melastomataceae classification has largely been based on characteristics of the androecium. It can be said that in terms of stamen morphology, the family has a high diversity of forms. Some of the features most used in distinguishing species are filament length and indument, presence of connective appendages and their shape, color and indument, and anther shape and dehiscence. The species in the albicans clade have 10 free stamens, in two whorls that are slightly heteromorphic. The antesepalous whorl is larger compared to the antepetalous whorl. The filaments are straight, glabrous and usually white. The anthers are oblong and dehiscent through a small apical pore (except for *M. hypoleuca* and *M. navioensis* that have expanded pores that are ventrally inclined and similar to longitudinal slits). Most species have white anthers, but *M. fallax* and *M stenostachya* have yellow anthers that turn red after pollination (Baumgratz 1987). The connectives have ventral, bilobate appendages, and can have a dorsal downward pointing projection.

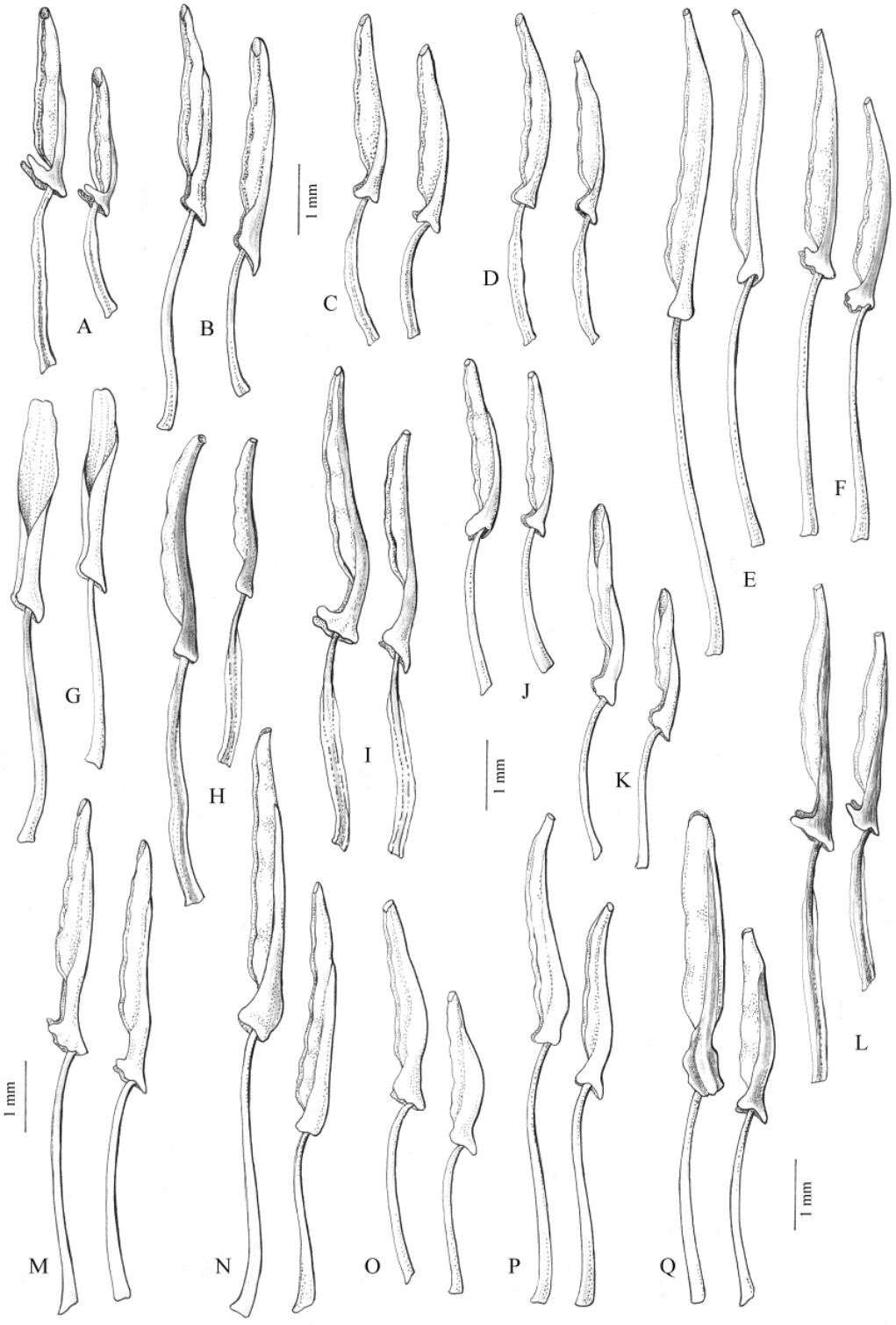

FIGURE 10: Stamens in the albicans clade, left side antesepalous, right side antepetalous. A. *M. albicans*. B. *M. alboruescens*. C. *M. argyrophylla*. D. *M. astrocalyx*. E. *M. fallax*. F. *M. herpetica*. G. *M. hypoleuca*. H. *M. longispicata*. I. *M. lourteigiana*. J. *M. mayarae*. K. *M. navioensis*. L. *M. secundiflora*. M. *M. serialis*. N. *M. stenostachya*. O. *M. suberosa*. P. *M. viruensis*. Q. *M. weddellii*.

FRUITS AND SEEDS

In the evolutionary history of Melastomataceae, the fleshy fruits evolved from dry fruits at least four times (Clausing & Renner 2011). The fruits of *Miconia* are fleshy, and originate from an inferior to semi-inferior ovary (partially fused to the hypanthium). In the albicans clade, the species have baccate fruits with a juicy pulp and numerous seeds (more than a hundred). In most species, the ripe fruits are dark purple to black (e.g., *M. argyrophylla*, *M. astrocalyx*, *M. fallax*, *M. stenostachya*, *M. suberosa*) while in *M. albicans* they are turquoise green and in *M. hypoleuca* and *M. suberosa* they are orange (but may eventually turn black).

The seeds are ovoid-angular (except for *M. alborufescens* that has hemispherical seeds) with the raphal zone covering 90% of seed length. The seed surface has a multicellular sculpture with jigsaw ornamentation (Martin & Michelangeli 2008).

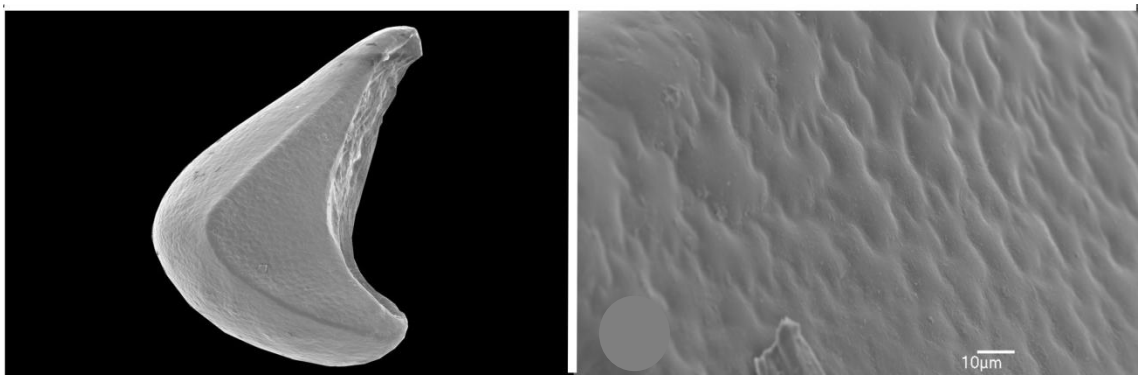

FIGURE 11. SEM of seed (left side)and seed surface (right side).

ANATOMY

Gottschall (1900) conducted a wide descriptive study of leaf anatomy of species from the Miconieae tribe, including the following species from albicans clade: *M. albicans*, *M. argyrophylla* and *M. longispicata* (as *M. longipedunculata* Cogn.).

Recently, the leaves of *M. albicans* and *M. hypoleuca* were studied based on specimens from the state of Pernambuco, Brazil (Oliveira 2007). According to the author, in *M. albicans* the stomata can be anisocytic and diacytic and druse crystals are present in the midvein region. Both species are hypostomatic with a single vascular bundle.

The anatomy of the leaves and petioles of 22 species of *Miconia* from the Brazilian cerrado, including individuals from sect. *Miconia*, subsect. *Seriatiflorae* (*M. albicans*, *M.*

fallax and *M. stenostachya*), were studied (Reis et al. 2004). The study showed that the characteristics of areoles, the relationship between primary and secondary veins, the presence of faint marginal veins and the organization of the vein network are diagnostic for genus and its tribes. Another important character is petiole anatomy because the position of vascular bundles can be useful in species recognition. The petiole of *Miconia stenostachya* has vascular bundles randomly distributed with several dispersed, sclerified cells.

CHROMOSOMES

In the albicans clade, many species are polyploids according to literature (Wurdack & Solt 1980, Goldenberg & Shepherd 1998). *Miconia stenostachya* is a triploid and apomictic (Goldenberg & Shepherd 1998). Apparently, the apomictic species originated from polyploid species (Goldenberg and Shepherd 1998). Polyploids seem to be especially common in the albicans clade, particularly in the fallax subclade, where the morphological borders between species are not very clear and the species seem to be able to hybridize. The polyploidy verified in *M. albicans* is frequently observed in other widely distributed species (Gamba & Almeda 2014).

POLLINATION

In Melastomataceae, most species are pollinated by vibrating bees that extract pollen from the poricidal anthers (Renner 1989). In some of the genus there is a labor division between the antesepalous and the antepetalous stamen whorls (Luo et al. 2000). One stamen whorl is the gamete producer (anthers usually purple) and the second (yellow anthers) only provides food to the pollinators because the pollen is sterile (Luo et al. 2000).

In *Miconia*, most species have diminute flowers with white to bright pink petals and white, pink, purple or yellow stamens. The pollination of *M. stenostachya* was described by Baumgratz & Silva (1987).

BREEDING SYSTEMS

Asexual reproduction is very common in tribe Miconieae, where there are many apomictic species (Goldenberg & Shepherd 1998). In the albicans clade, *M. albicans, M. argyrophylla, M. fallax* and *M. stenostachya* are known to be apomictic (Renner 1989, Goldenberg & Shepherd 1998, Cortez et al. 2014). The meiotic process in pollen production is highly irregular in most anthers of *M. fallax* and *M. stenostachya* and was not observed in *M. albicans* (Caetano et al. 2013).

DISPERSION

A recently published study in an Andean forest showed that the flowering seasons of different Melastomataceae species coincide with each other and also with the breeding season of the frugivore bird community. The species produce fruits all year and are an important source of food for the birds (Kessler-Rios & Kattan 2012).

In tribe Miconieae, the species possess fleshy fruits with soft placentas and high water and sugar content (Mendes-Rodrigues & Oliveira *in press*). The abundant and small fruits favor the development of a generalist dispersal system (Silveira 2012). Some species that occur that in the Brazilian Cerrado (e.g., *M. albicans*, *M. alborufescens* and *M. stenostachya*) were tested for germination after passing through the intestinal tract of birds; however, there was no significant difference between them and the seeds not ingested by the birds (Silveira 2012). These three species took between 9 and 22 days to germinate (Silveira 2012).

The small rodent *Bolomys lasiurus* (Muridae) was cited as a disperser of *M. albicans* in savanna vegetation in the region of Santarém, Pará, Brazil (Magnusson & Sanaiotti 1987). Leite et al. (2013) cited *saúvas* ants (*Atta*) as the primary dispersers of *M. albicans* in a cerrado fragment. The ants from the genera *Atta*, *Acromyrmex* and *Ectatomma*s have also been cited as dispersers of *M. albicans* and *M. alborufescens* seeds. They were observed carrying the seeds and also separating them from the pulp, which would improve germination rates (Lima et al. 2012).

TAXONOMIC TREATMENT

KEY TO THE SPECIES OF THE ALBICANS CLADE

1. Leaves with abaxial surface densely covered by individual, stellate or dendritic hairs.

2. Inflorescence thyrsoid with subscorpioid branches

3. Connective in the antesepalous stamens conspicuously prolonged (≥ 0.2 mm) below the thecae, with ventral or dorsal appendages covering the connection of filament to the anther like a skirt

4. Connective appendages with ventral projections, crenulate to fringed, without a round, dorsal, downward projection; ovary apex glabrous…….....……....***M. herpetica***

4**.** Connective appendages ventrally bilobed, not crenulate or fringed, with a round, dorsal, downward projection; ovary apex glandulate.....***M. weddelli***

3. Connective in the antesepalous stamens not prolonged (or 0–0.1 mm) below the thecae, with very discrete bilobed ventral appendages, not covering the connection of the filament to the anther.

5. Calyx lobes with the inner part pilose at the base, 1.2–2 mm long; anthers yellow; endemic to the region of Chapada Diamantina.....***M. astrocalyx***

5. Calyx lobes with the inner part glabrous in the base, ca. 0.5 mm long; anthers white; endemic to the Amazon..... ***M. macuxi***

2. Inflorescence spiciform or panicle with scorpioid distal branches

6. Inflorescence spiciform.....***M. longispicata***

6. Inflorescence a panicle

7. Young branches with dendritic and stellate hairs; leaves 24.5–47.5 cm long; endemic to the Amazon.....***M. suberosa***

7. Young branches without dendritic hairs, only stellate; leaves 3–13.4 cm long; endemic to the Cerrado.....***M. herpetica***

1. Leaves with abaxial surface densely covered with amorphous or arachnoid hairs, these not individually distinguishable

8. Veins suprabasal

9. Leaf base decurrent; blade margin entire, not ciliate.....***M. serialis***

9. Leaf base auriculate; blade margin crenulate, ciliate.....***M. secundiflora***

8. Veins basal

10. Petal margins glandulate-ciliolate

11. Branches quadrangular or winged

12. Branches winged.....***M. pterocaulon***

12. Branches not winged

13. Petals 0.7–1 mm wide; anthers 1.7–2.8 mm long, white; style 6.4–6.7 mm long.....***M. argyrophylla***

13. Petals 1.2–1.5 mm wide; anthers 4.1–4.3 mm long, yellow; style 6.9–8 mm long.....***M. stenostachya***

11. Branches cylindric

14. Hypanthium 3–3.8 mm long; anthers yellow.....***M. fallax***

14. Hypanthium 1.3–1.7 mm long; anthers white.....***M. mayarae***

10. Petal margins glabrous

15. Inflorescence a panicle

16. Leaf base acute; anthers dehiscent by two ventral expanded pores resembling longitudinal slits.....***M. hypoleuca***

16. Leaf base obtuse, cordulate or cordate; anthers poricidal

17. Leaves cordate; stigma punctifom; ripe fruit reddish.....***M. alborufescens***

17. Leaves oblong; stigma expanded or capitate; ripe fruits bluish green.....***M. albicans***

15. Inflorescence a thyrse with bifid, secundiflorous, subscorpioid branches

18. Petals 1.6–1.8 mm long; connective prolonged 0.6–0.8 mm below the thecae; anthers dehiscent by a ventral, expanded, inclined apical pore resembling a slit; style 3.2–3.5 mm long.....***M. navioensis***

18. Petals 2.1–2.8 mm long; connective prolonged 0.8–1 mm below the thecae; anthers dehiscent by an apical pore; style 3.7–6 mm long .....***M. lourteigiana***

1. *Miconia albicans* (Sw.) Steud., Nomencl. Bot. 2: 139 (1841). Basionym: *Melastoma albicans* Sw., Prodr. 70 (1788). *Miconia albicans* (Sw.) Triana, Trans. Linn. Soc. London 28: 116 (1871), *nom. illeg*. *Acinodendron albicans* (Sw.) Kuntze, Revis. Gen. Pl. 2: 950 (1891). Type:—JAMAICA. *Swartz s.n.* Lectotype: S-image!; isolectotype: BM-image!.

Melastoma holosericeum Vahl, Eclog. Amer. 1: 42 (1797). Type:—"South America" *Rohr s.n.* Lectotype: C-image!

Melastoma velutinum Willd., Sp. Pl. 2: 584 (1799). Holotype: *Swartz 176* B (destroyed).

Miconia detergibilis DC., Prodr. 3: 181 (1828). Type:—BRAZIL. *Martius s.n.* Lectotype designated here: M!; Isolectotype: G-DC! (fragment). *Melastoma detergibile* Schrank & Mart. ex DC., Prodr. 3: 181 (1828), *pro syn*.

Miconia holosericea var. *acuminata* Ser. ex DC., Prodr. 3: 182 (1828). Type:—BRAZIL. Lectotype designated here: *Martius s.n.* (M).

Miconia holosericea var. *oblongata* Ser. ex DC., Prodr. 3: 182 (1828). Type:—BRAZIL. Lectotype designated here: *Martius s.n.* (M!).

Miconia holosericea var. *obtusiuscula* DC., Prodr. 3: 182 (1828). Type:—BRAZIL. Lectotype designated here: *Martius s.n.* (M!).

Miconia heterochroa Miq., Linnaea 17: 621 (1844). Type:—SURINAME. Lectotype designated here: *Focke 1010* (U-image!).

Miconia renggeri Steud., Flora 27: 723 (1844). Type:—PARAGUAY. Lectotype: *Rengger s.n.* (P!).

Miconia holosericea var. *montana* Crueg., Linnaea 20: 110 (1847). Type:—TRINIDAD (Collector name, number and Herbarium not mentioned). *Miconia montana* Crueg. ex Triana, Trans. Linn. Soc. London 28: 116 (1871), *pro syn*.

Miconia rufescens Macfad. ex Griseb., Fl. Brit. W. Indian Is. 256 (1860). Invalid name.

Melastoma nitidum Pav. ex Triana, Trans. Linn. Soc. London 28: 116 (1871), *pro syn*. Type:—PERU. Lectotype designated here: *Pavón s.n.* (BM-image!)

Treelets up to 3 m high; branches, petioles, abaxial surface of leaves, inflorescence and hypanthium densely covered by vermiform whitish trichomes. Branches rounded. Petioles 0.2–1.4 cm long. Blades 2.5–16.5 x 1.2–6 cm, oblong to ovate, apex rounded to acuminate, base obtuse and cordulate, margin entire to slightly serrulate in the superior third, adaxial surface of young leaves densely covered by whitish vermiform trichomes, in mature leaves glabrous, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses to panicles 4.5–19 x 3–14 cm, terminal, branches bifid to trifid and secund, 0.9–2.5 cm long. bracts and bracteoles persistent. Flowers 5-merous. Hypanthium 1.7–2.5 mm long, campanulate, inner surface glabrous. torus glabrous. Calyx inner lobes 0.4–0.5 mm long triangulars, persistent in fruit, inner surface glabrous, outer teeth lobes ca. 0.1 mm, tube 0.1–0.4 mm long. Petals 2.1–2.7x1.2–1.4 mm, margins glabrous. Stamens white, dimorphic. filaments in the antesepalous stamens 2.2–2.5 mm long, in the antepetalous 1.5–2.4 mm long, both glabrous. connectives prolonged below the thecae 0.8–0.9 mm long in the antesepalous and 0.6–0.7 mm long in the antepetalous, with two big ventral appendages in the antesepalous stamens and two small, ventral, appendages and a dorsal spur in the antepetalous. anthers 2–2.4 mm long in the antesepalous and 1.7–1.8 mm long in the antepetalous oblong, with a single terminal, ventrally inclined pore, ca. 0.2 mm diam. Ovary ca. 1.6 mm long, 1/3 adherent to the hypanthium, 3-locular, apex glabrous. Style 3.7–4.3 mm long, straight, stigma capitate, glabrous. Fruits baccate, 3–5 mm diam., light green to blue when ripe, 26–38 seeds.

Additional specimens examined:—BELIZE. Stann Creek: Cockscomb Basin, 9 Jan 1990. *Arvigo 288* (NY). Silk Grass Village, 29 Nov 1990, *Balick 3088* (NY). **Cayo:** Augustine, 16 Aug 1986, *Ratter 5156* (NY); 15 May 1995, *Lentz 2385* (NY). "Between San Luis y Cuevas", 28 May 1973, *Croat 23515* (P), Mountain Pine Ridge, 23 Jan 1990, *Balick 2257* (NY). "Rio On", 22 May 1996, *Nee 6778* (NY). Spanish Lookout, 20 Aug 1986, *Ratter 5193* (NY). **Toledo:** Bladden Branch, 15 Mar 1987, *Brant 1054* (NY, RB). Chun Bank, 1 Aug

1995, *Atha 1210* (NY). **BOLIVIA.** s.l.:1839, *Pentland s.n.* (P), 1851, *Weddell s.n.* (P). "De Joya a Capayaga, s.d., *Mandon s.n.* (P). **Beni:** Vaca Díez, 18 Oct 1991, *Beck 20489* (US); 16 July 2003, *Torrico 1424* (NY). **La Paz**: Larecaja, 8 Nov 1939, *Krukoff 11123* (US); 8 Nov 1939, *Krukoff 11147* (US). Mapiri, Nov 1907, *Buchtien 1714* (US); 12 Nov 1926, *Buchtien 999* (US). Nor Yungas: Dec 1917, *Buchtien 5989* (US); 21 Oct 1984, *Solomon 12556* (NY, US); 17 Sep 1997, *Muller 6182* (NY). Yungas, 1885, *Rusby 2299* (NY, P, US), 1890, *Bang 431* (US). Coroico, 1839, *Pentland 155* (P). Sud Yungas: 10 Nov 1990, *Lewis 37966* (US). **Santa Cruz:** Florida, 14 Dec 1991, *Nee 42102* (NY, US). Ibañez, 25 Sep 1989, *Coimbra 754* (US). Ichilo, 31 Oct 1990, *Nee 39635* (NY, US); 7 Nov 1990, *Nee 39753* (NY). Nuflo de Chavez, 3 Sep 1986, *Killeen 2148* (NY, US). Velasco, 23 Jun 1991, *Nee 41275* (US); 17 Oct 1993, *Killeen 5637* (US). **BRAZIL.** s.l.: s.d., *Burchell 2035* (P), s.d., *Burchell 2697* (K, P), s.d. *Blanchet 3309* (NY), s.d., *Burchell 9420-2* (P), s.d., *Casaretto 2136* (G 256614/9), *Clausen 126* (G 256595/1), *Loefgren s.n.* (P).; s.d., *Loefgren 884* (P), s.d., *Loefgren 1172* (P), *Martius 275* (P), 1834, *Riedel 417* (P), 1841, *Sellow s.n.* (NY), Oct 1963, *Silva 57164* (NY), *Swainson s.n* (K-K000833035). "Brasilia", s.d., *Riedel s.n.* (P), *Sellow s.n.* (P), S.d., *Warming 2203* (P), 1840, *Claussen s.n.* (P). "Bords de l´Amazon", s.d., *Poeppig s.n.* (P). "Brésil central, Sertão d´Amaroileté", Sep 1844, *Weddell 2696* (P). "Brésil meridional", 1842, *Dupré s.n.* (P). "Bords du Rio Tocantins", Aug 1844, *Weddell 2461* (P). **Alagoas:** 1838, *Gardner 1289* (K, NY, P, US), 1839, *Gardner 1287* (P), s.d., *Netto s.n.* (P). **Amapá:** Ferreira Gomes, 23 Jul 2009, *Rocha 1102* (MG). Macapá, 10 Jul 1951, *Froés 27363* (IAN); 10 Oct 1979, *Austin 7001* (MG, NY, US); 13 Oct 1976, *Ribeiro 1501* (INPA, MG, NY); 13 Oct 1976, *Rosa 991* (MG, NY, RB). **Amazonas:** Manaus, Aug 1948, *Corner 74* (IAN); 18 Aug 1985, *Nelson 1426* (NY, US). 3 Nov 81, *Renner 554* (INPA, US). "Margem do Rio Jatapu", 9 Dec 1973, *Ribeiro 483* (IAN). "Prope Barra, Prov. Rio Negro, 1851 *Spruce s.n.* (P-P05291217), 1851, *Spruce 1809*. **Bahia:** sl., s.d., *Blanchet s.n.* (P-P05157207, P05157208, P05157209, P05157210, P05157211, P05157212, P05157218). *Bunge s.n.* (P), s.d., *Salzmann s.n.* (P-P05291257). s.d., *Blanchet* 218 (P), s.d., *Blanchet 769* (NY), 1831, *Blanchet 587* (NY), 1919, *Curran 2* (NY, P, RB). Amélia Rodrigues, 20 Mar 1987, *Queiroz 1451* (US). Belmonte, 7 Jan 1981, *Carvalho 459* (US). Campo Formoso 31 Jan 1993, *Thomas 9673* (NY). Carangola, 29 Sep 2008, *Leoni 7253* (NY). Abaíra, 30 Jan 1992, *Harley 51355* (NY). Baianópolis, 15 May 1997, *Cardoso 47* (NY). Entre Rios, 22 Jan 2004, *Santos 252* (NY). Gameleira, 8 Aug 1997, *Pignal 551* (P), 1 Sep 1997, *Pignal 674* (P). Ilhéus, Mar 1821, *Riedel 332* (NY); 12 July 1918, *Curran 424* (NY); 11 July 2012, *Rocha 720* (NY). Itacaré, 15 Apr 1970, *Santos 710* (NY); 22

Feb 1981, *Souza 322* (US). Jacobina, 20 Apr 2009, *Guedes 14714* (NY, US). Lauro de Freitas, 16 May 2009, *Guedes 16532* (US). Lençóis, 7 Mar 84, *Noblick 3045* (NY). Maracás, 15 Feb 1979, *Santos 3452* (NY, US). Maraú, 13 Jun 1979, Ribeiro 8 (US); May 1980, *Harley 22042* (NY). Mata de São João, 22 Feb 1960, *De la Sota* 2548 (NY); 11 Jul 2002, *Medeiros 204* (RB). "Morro do Chapéu", 19 Feb 1971, *Irwin 32564* (NY, US). Palmeiras, 9 Dec 2007, *Guedes 14296* (NY). Piatã, 10 Oct 2009, *Roque 2392* (NY, US). Porto Seguro, 16 Jun 2006, *Lopes 843* (NY). Rio de Contas, 11 Dec 1988, *Harley 27114* (US); 27 Dec 1997, *Carvalho 6333* (NY). "Rodovia Itabuna-Ilhéus", 5 Apr 1965, *Belém 706* (US). "Rodovia de Porto Seguro a Eunápolis", 25 Nov 1971, *Eupunino 36* (US). Santa Cruz Cabrália, 21 Aug 1978, *Mori 10881* (NY); 26 Nov 1987, *Maas 7024* (US). Santa Terezinha, 3 Apr 1999, *Senna 13* (MG). Santo Amaro, 11 Nov 1983, *Lima 208* (MG). Valença, 14 Jan 1997, *Arbo 7189* (NY). **Ceará:** s.l., 1836-1842, *Gardner 1604* (NY, P), 1839, *Gardner 1287* (P). 1841, Barbalha, 16 Dec 2000, *Costa 125* (UEC). "Serra de Araripe", Oct 1958, *Schnell 9431* (P-P04827137, P04827138). **Distrito Federal:** "Área de Proteção Ambiental do Gama", 25 Sep 2002, Mendonça 5053 (UEC). Brasília. 7 Sep 1962, *Duarte 62* (NY); 20 Sep 1962, *Heringer 9006* (NY); 16 Aug 1964, *Irwin 5174* (MG, NY); 25 Aug 1965, *Irwin 7871* (NY); 4 Oct 1965, *Irwin 8929* (NY, US); 1 Sep 1976, *Ratter 3514* (US); 2 Jan 1977, *Ratter 4067* (NY); 20 Sep 1977, *Heringer 93* (MG, NY); 21 Sep 1977, *Heringer 100* (P), 23 Oct 1978, *Heringer 670* (NY); 22 Nov 1978, *Heringer 739* (NY); 30 Aug 1979, *Heringer 17430* (MG, NY); 1 Oct 1979, *Heringer 2142* (NY); 9 Sep 1980, *Heringer 5447* (NY); 26 Oct 1981, *Kirkbride 4523* (INPA, NY); 6 Nov 1981, *Costich 1016* (NY); 11 Oct 1982, *Kirkbride 4996* (NY); 29 Aug 1983, *Kirkbride 5366* (NY); 26 Sep 1983, *Kirkbride 5392* (INPA, NY); 30 Sep 1990, *Ramos 19* (NY); 21 Dec 1992, *Munhoz 6* (NY); 18 Mar 1994, *Munhoz 77* (INPA, NY). Gama, 30 Oct 2000, *Brito 114* (RB). "SE do alojamento estudantil da UnB, *12 Oct 1981, Valle 9* (P). **Espírito Santo:** s.l., 1816-1821, *Saint-Hilaire 338* (P). Aracruz, 16 Jul 73, *Araújo 273* (NY). Fundão, 11 Sep 1984, *Pizziolo 231* (NY, UPCB). Linhares, 21 Apr 2011, *Lima 277* (RB). Serra, 10 May 1993, *Pirani 2780* (NY, US). Vitória, 9 Dec 1964, *Trinta 1059* (NY, US). **Goiás:** Alto Paraíso, 9 Oct 1979, *Heringer 2278* (MG, NY); 10 Oct 1979, *Heringer 2370* (NY); 24 Jan 1980, *King 8294* (US), 23 Oct 1996, *Mendonça 2921* (P). Alvorada do Norte, 25 Jul 2007, *Saavedra 502* (NY). Anápolis, 26 Nov 1976, *Shepherd 3601* (NY). Caiapônia, 26 Oct 1964, *Irwin 7383* (NY, US). Caldas Novas, 28 Sep 1995, *Cavalcanti 737* (NY). Catalão, s.d., *Riedel 1834* (NY). Cristalina, 5 Mar 1966, *Irwin 13597* (NY, US); 10 Oct 1988, *Kral 75275* (NY, P). "Entre Jataí e Caiapônia", 2 Oct 1968, *Sidney 961* (US). "Ilha do Bananal",

15 Sep 1980, *Ratter 4407* (US). Jataí, 29 Sep 1947, *Macedo 979* (US). Pires do Rio, 10 Oct 1988, *Kral 75234* (MG, P, US). Pirineus, 26 Dez 1968, *Harley 11490* (P). Uruaçú, 24 May 1998, *Fonseca 1943* (US). Urutaí, 10 Oct 1988, *Kral 75234* (NY). Vila Propício, 21 Oct 2010, *Fonseca 4910* (RB). **Maranhão:** Carolina, 9 August 1993, *Ratter 6792* (INPA, US). São Luís, 6 Aug 1980, *Silva 5687* (MG). **Mato Grosso:** 1833, *Gaudichau 189* (P), 1891, *Moore 138* (NY); 23 Aug 1968, *Argent 6683* (K, NY); Acorizal, 15 Nov 1967, *Philcox 3063* (K, NY, P, RB); 22 Apr 1978, *Schaller 113* (NY); 9 Jun 1979, *Prance 26119* (NY). Alto Araguaia, 30 Sep 1963, *Maguire 56970* (NY); 18 Sep 1996, *Proença 1523* (NY). "Anhuma creek", 29 Sep 1963, *Maguire 56918* (US). Barra do Garças, 27 Aug 1968, *Eiten 8398* (K, NY); 9 Sep 1968*, Eiten 8637* (K, NY, P, US); 14 Dec 1969, *Eiten 9924* (K, NY); 5 May 1973, *Anderson 9748* (NY). "Central Brazilian Plateau", 23 Aug 1968, *Richards 6683* (K, P), 14 Sep 1968, *Harley 10018* (K, NY, P, US), 31 Oct 1968, *Harley 10895* (K, NY, P). "Chapada dos Guimarães", 12 Oct 1973, *Prance 18830* (INPA, MG, NY); Nov 1996, Pinto s.n. (RB). Comodoro, 25 Sep 1963, *Maguire 56828* (NY). Cuiabá, 1841, *Martius 275* (NY); 28 Jun 1927, *Collenette 122* (K, NY); Sep 1927, *Collenette 157* (K, NY, RB); 4 Oct 1979, *Macedo 413* (NY); 24 Sep 1988, *Kral 75055* (NY). Diamantina, 17 Sep 1985, *Ferreira 6063* (MG, US). "Garapú", 02 Oct 1964, *Irwin 6565* (K, NY, US). Nova Xavantina, 9 Dec 1967, *Philcox 3451a* (K, NY). Pedra Preta, 21 Oct 1991, *Dubs 1190* (US). "Serra de São Vicente", 27 Sep 1988, *Kral 75100* (US). "Serra Ricardo Franco", 25 Sep 1978, *Windisch 2162* (US). Tangará da Serra, 3 Sep 1986, *Santos 204* (MG). "Xavantina", 27 Jul 1967, *Ratter 511* (P, US). **Mato Grosso do Sul:** Aquidauana, 3 Jul 1977, *Krapovickas 32889* (NY). Bandeira, 15 Jul 1966, *Goodland 286* (NY). Campo Grande, 29 Aug 1990, *Resende 37* (P). Corumbá, 23 Aug 1991, *Cervi 3308* (US); 8 Jun 1994, *Hatschbach 60826* (US). Coxim, 16 May 1973, *Hatschbach 31982* (NY, US). Rio Brilhante, 14 May 1970, *Hatschbach 24264* (US). Robas do Rio Pardo, 10 Nov 1991, *Dubs 1322* (US). São Gabriel do Oeste, 21 Sep 1996, Simon 41 (NY). Três Lagoas, 20 Oct 1964, *Gomes 2368* (NY, US). **Minas Gerais:** s.l., s.d. *Claussen 24* (US), 1834, *Claussen 1669* (P), 1838, *Claussen 569* (P), Sep 1839, *Claussen 126* (P), s. l., 1840, *Clausen 329A* (NY); 1840, *Claussen 1024* (P), Nov 1843 *Weddell 1213* (P), 1967, *Goodland 758* (NY). Augusto de Lima, 3 May 1963*, Duarte 7708* (NY). Barbacena, s.d., *Pohl 209* (NY). Barroso, Belo Horizonte, 4 Sep 1945, *Williams 7444* (K, NY, US); 6 Sep 1945, *Williams 8052* (NY, P, US). Bom Sucesso, s.d., *Pohl 3405* (NY). Buenópolis, 12 Oct 1988, *Harley 24856* (K, NY, P, US). Carrancas, 10 Oct 1997, *Matsumoto* 483 (UEC). Catiára, 23 Aug 1950, *Duarte 2939* (NY); 29 Sep 1976, *Heringer 15998* (NY). Frutal, 6 Sep 1976, *Gibbs*

2639 (NY). Descoberto, 3 Nov 2012, *Assis 611* (RB). Diogo de Vasconcelos, 28 Sep 2000, *Carvalho 719* (RB).Furnas, 26 Jul 1972, *Mello Filho 3620* (NY). Grão-Mogol, 23 Oct 1978, *Hatschbach 41653* (US); 22 Jul 1985, *Martinelli 11243* (NY). Januária, 14 Jul 2005, *Silva 1431* (NY). Lagoa Santa, s.d., *Warming s.n.* (P-P05291214). Mariana, 2 Feb 1971, *Irwin 29645* (NY); 10 Sep 2009, *Rolim 108* (NY). Marliéria, 22 Sep 1975, *Heringer 15150* (NY). Montes Claros, 4 Mar 1995, *Sevilha s.n.* (RB). Paracatú, 24 Sep 1895, *Glaziou 21388* (NY, P). Paraopeba, 01 Sep 1979, *Heringer 17507* (NY). Piuhmi, 26 Jul 1972, *Mello Filho 3612* (NY). Rio Doce, 8 Oct 1997, *Catharino 2174* (P). Santa Bárbara, Dec 1988, *Costa 459* (NY). Santa Luzia, 25 Oct 1961, *Duarte 6407* (US). Santana do Riacho, 6 Nov 1981, *Salgado 195* (RB). São Gotardo, 31 Jul 1981, *Silva 60* (MG, RB). São Roque de Minas, 23 Sep 1996, *Romero 3630* (NY); 29 Sep 1995, *Nakajima 1393* (US). São Tomé das Letras, 29 Sep 1968, *Monteiros 84* (US). "Serra do Cipó", 16 Jan 1989, *Renner 2117* (P). Três Marias, 5 Sep 1979, *Heringer 17521* (NY). Uberlândia, 12 May 1978, *Fujimoto 11* (NY). Viçosa, 4 Nov 1958, *Irwin 2016* (NY, US). **Pará**: Almeirim, 13 Oct 1902, *Ducke 3050* (MG). Belém, 8 Jul 2009, *Fraga 2808* (NY). Bragança, 8 Apr 1980, *Davidse 18060* (INPA, MG, NY). "Cachoeira do Acará", 30 Jul 1973, *Ribeiro 286* (IAN). Cachoeira do Acari, 14 Feb 2004, *Carreira 2519* (MG). Conceição do Araguaia, 18 Aug 1955, *Macedo 4056* (IAN, RB, US); 24 Sep 2000, *Lobato 2693* (MG). Curralinho, 22 Aug 1948, *Murça-Pires 1254* (IAN). Faro, 13 Sep 1980, *Ferreira 2434* (INPA, MG, NY, US). Maicurú, 15 Aug 1955, *Black 55-18629* (IAN, NY). Magalhães Barata, 10 Feb 1992, *Oliveira 92* (MG); 16 Dec 2002, *Oliveira 530* (MG). Marajó, 12 Nov 1948, *Black 48-3442* (IAN). Marapanim, 20 Mar 1963, *Oliveira 3297* (IAN). Monte Alegre, 14 Aug 1968, *Silva 1561* (MG). Muaná, 11 Dec 1964, *Oliveira 3172* (IAN). Novo Progresso, 4 Nov 1977, *Prance 24793* (NY, UEC); Salvaterra, 10 Jan 1982, *Rosário 121* (INPA, MG, NY). Santarém, Nov 1849, *Spruce s.n*. (K, NY); Nov 1849, *Spruce 390* (P); 25 Dec 1956, *Pires 6485* (IAN, NY); 13 Dec 1978, *Maciel 332* (INPA, MG, NY); 23 Feb 1986, *Ackerly 164* (INPA, NY); 17 Oct 2000, *Souza 1613* (IAN); 15 Oct 2012, *Meirelles 883* (UEC). "Serra do Cachimbo", 12 Nov 1977, *Prance 25289* (MG, NY, RB). "Sete Varas airstrip on Rio Curuá", 5 Aug 1981, *Strudwick 4150* (IAN, INPA, MG, NY). Vigia, 30 Sep 1948, *Black 48-3230* (IAN, NY); 30 Dec 1956, *Black 56-18963* (IAN). **Paraíba:** Jacaraú, 22 Mar 2012, *Gadelha Neto 3224* (NY). Mataraca, 15 Mar 2012, *Gadelha Neto* 3184 (NY, RB). Rio Tinto, 3 Mar 2003, *Barbosa 2763* (NY). **Paraná:** Adrianópolis, 18 Oct 2005, *Goldenberg 751* (NY). Antonina, 16 Sep 1965, *Hatschbach 12759* (K, MG, NY, P, US). Castro 3 Oct 1964, *Hatschbach 11665* (US). Guaraqueçaba, 7 Aug 1993, *Athayde 41* (NY). Jaguariaíva, 10

Oct 1958, *Hatschbach 5084* (US); 18 Nov 2006, *Gasper 284* (RB). Sengés, 6 Oct 1971, *Hatschbach 27101* (K, NY, US). Tibagi, 10 Nov 1992, *Hatschbach 58164* (US); 24 Oct 1996, *Gatti 37* (NY); 13 Dec 1996, *Silva 1831* (NY). Ventania, 4 Sep 1998, *Silva 2462* (INPA, NY). **Pernambuco:** Bonito, 15 Mar 1995, *Melo 30* (NY); 15 May 1995, *Menezes 58* (NY). "Cabo", Oct 1993, *Oliveira 109* (MG). Goiana, 27 Jan 2010, *Ferreira 79* (NY). Igarassu, 22 Jan 1959, Tavares 469 (US); 8 Oct 2003, *Silva 184* (NY); 7 Jan 2008, *Gomes 208* (RB). Maraial, 23 Mar 1997, *Siqueira-Filho 493* (RB). Palmares, 27 Dec 1963, *Paiva 3154* (US). São Vicente Ferrer, 18 Apr 1995, *Oliveira 33* (K, NY); *Tschá 78* (US); 8 Jan 1996, *Marcon 103* (NY). **Piauí:** "Serra Branca" , 11 Feb 1984, *Euperácie 2486* (P). "Serra da Capivara", 20 Jul 1982, *Euperácie 751* (P). Sete Cidades, 16 Sep 1977, *Barroso 281* (RB). **Rio de Janeiro:** s.l., Nov 1768, *Banks s.n.* (NY),1828, *Gay s.n.* (P-P05206329), s.d., *Gaudichau, s.n* (P- P05206324), Aug 1832, *Gaudichau, 737* (P), 10 Sep 1868, *Glaziou 2867* (P), Dec 1892, *Kuntze s.n.* (NY). Angra dos Reis, 18 Apr 1987, *Giordano 284* (RB). Caxias, 30 Apr 1979, *Lima 933* (NY). "Ilha do Governador", 8 Oct 1960, *Martins 211* (US). "Ilha Paquetá", 28 Oct 1901, *Dusén 10* (MG). Itaboraí, 18 Mar 1990, *Pedrosa 1238* (P). Macaé, 20 Dec 2000, *Baumgratz 784* (NY, RB). Magé, 1880, *Glaziou 2996* (P). Mangaratiba, 7 Apr 2007, *Silva 12* (RB). Niterói, 27 Mar 1826, *Burchell 2835* (NY). Paraty, 2005, *Verçoza s.n.* (NY). "Praia Grande", Feb 1869, *Glaziou 2996* (P). Resende, 11 Sep 1990, *Carauta 6230* (US). Silva Jardim, 12 Jul 1994, *Lima 4905* (MG); 17 Nov 1994, *Luchiari 543* (K, MG, NY). Teresópolis, 6 Sep 1871, *Glaziou 4807* (P). **Rio Grande do Norte:** Natal, 9 Nov 1951, *Alvarenga 34* (RB). **Rondônia:** Cerejeiras, 14 Jun 1997, *Miranda 1388* (IAN). Porto Velho, 28 Aug 1978, *Rosa 456* (IAN, MG, US). Vilhena, 25 Sep 1963, *Maguire 56828* (US); 25 Oct 1979, *Vieira 607* (INPA, MG, NY); 7 Nov 1979, *Vieira 991* (MG, NY); 25 May 1997, *Miranda 1570* (IAN, MG). **Roraima:** Boa Vista, 26 Oct 1977, *Coradin 879* (IAN, INPA, NY). "Fazenda São Marcos", 9 Apr 1964, *Silva 278* (IAN, MG); 9 Apr 1964, *Silva 288* (IAN, MG). Pacaraima, 8 Nov 2011, *Meirelles 796* (INPA, JOI). "Rio Cotinga", 3 Mar 1974, *Silva 105* (IAN, MG). Tepequem, 10 Feb 1967, *Prance 4290* (INPA, K, MG, NY). **São Paulo:** s.l., 1833, *Gaudichau 782* (P), 18 Oct 1855, *Regnell "III 30"* (P). Anhembí, 2 May 1959, *Kuhlmann 4566* (P). Botucatu, 21 May 1870, *Gottsberger 194* (P), 21 Sep 1972, *Gottsberger 98R-21972*; 13 Oct 1973, *Gottsberger 12R-131073* (US). Caieiras, 11 Oct 1946, *Hoehne s.n.* (3498920 US). Itapetininga, 22 Sep 1887, *Loefgren s.n.* (P). Itararé, 20 Jun 1993, *Cervi 4114* (NY). Itirapina, 13 Sep 1962, *Felippe 77* (NY, US). Mogi-Guaçu, 23 Sep 1960, *Mattos 8364* (US); 22 Jun 1977, *Kirizawa 112* (MG, NY); 19 Jan 1980, *Filho s.n.* (NY); 24 Nov 1977, *Sakane 718* (NY). Mogi-Mirim, 15 Aug

1827, *Burchell 5126* (NY, P); 14 Nov 1901, *Hammar 11706* (NY). Óleo, 1 Jul 1901, *Wettstein s.n.* (NY). Piracicaba, 27 Oct 1962, *Fosberg 43314* (NY, US); 18 Sep 1965, *Goodland 27* (NY). Pirassununga, 3 Sep 1972, *Klein 10335* (US). Santa Rita do Passa Quatro, 14 Aug 1995, *Batalha 895* (P). São Carlos, 7 Sep 1961, *Campos 40* (US). São José dos Campos, 25 Oct 1961, *Mimura 62* (K, NY, P); 11 Sep 1962, *Mimura 540* (NY, US), 14 Oct 1964, *Eiten 5744* (US), *Eiten 5745* (K, NY, US). São Simão, 29 Nov 1960, *Mattos 8625* (US). Tanabi, 29 Sep 1987, *Deguchi B1635* (NY). Ubatuba 10 Dec 1989, *Furlan 1129* (US). **Sergipe:** Capela, 19 Apr 2012, *Gomes 359* (NY). Itabaiana, 28 Mar 1997, *Vicente 6* (RB). Santa Luzia do Itanhy, 23 Jan 1983, *Pirani 2645* (NY); 16 Apr 2012, *Déda 125* (NY); 19 Apr 2012, *Gomes 372* (NY). **Tocantins:** Gurupi, 26 Dec 1969, *Eiten 10019* (K, US). **COLOMBIA**. s.l. Apr 1843, *Linden 1332* (P). "Llanos orientales": La Macarena, Jan 1959, *García-Barriga 17045* (P). "Ocanã", Mar 1846, *Schlim 526* (P). Santa Marta, Mar 1898, *Smith 2074* (P, US)**. Antioquia:** Amalfi, 2 Octt 1992, *Fonnegra 4494* (US). Feb 2006, *Rivas 862* (NY). Belo,19 Jun 1930, *Archer 223* (US). "Cerro El Volador, 8 Dec 1948, *Molina 382* (US). Copacabana, Apr 1934, *Daniel 270* (US). Ituango, 10 May 1988, *Zarucchi 6421* (US).Medellín, 12 Nov 1930, *Archer 700* (US). Montebello, 22 May 1989, *Ciro 211* (NY, US); 22 May 1989, *Ciro 239* (NY). Santa Bárbara, 21 Sep 1922, *Pennell 10886* (NY). **Bolívar:** Morales, 9 Apr 1985, *Cuadros 2130* (US). **Bogotá:** La Mesa, 1851-1857, *Triana s.n.* (P-P05291136)."Versant orientales des Andes", 1851-1857, *Triana 1210* (US). **Boyacá:** 14 Mar 1939, *Haught 2674* (US). **Cauca:** S. l., s.d., *Triana 6258* (US). Calí, Dec 1905, *Pittier 634* (US). Chisquio, 7 Apr 1940, *Asplund 10790* (US). "Cordillera Central", 19 Mar 1943, *Fosberg 20316* (US). "Cordillére Ocidentale", 12 Nov 1899, *Langlassé 65* (P), 14 Nov 1899, *Langlassé 74* (P). Lang "Cuenca del Rio Mermejal", 31 Dec 1942, *Cuatrecasas 13865* (US). El Tambo, 20 Sep 1939, *Sneidern 2444* (US); Aug 1949, *Idrobo 81* (P, US). "Roadside between Santander y Piendamo", 18 Oct 1946, *Haught 5082* (US). Quebrada Las Tayas, 3 Oct 1944, *Core 1426* (US). Santader de Quilichao, 5 Oct 1954, *Fernández 2752* (US). "Vallées du Magisterio du Cauca, 1851-1857, *Triana s.n.* (P-P05291132). **"Cauca y Nariño":** "Carretera Popayán", 24 Jul 1948, *Garcia-Barriga 12992* (US). **Cesar:** 19 Jul 1974,*Garcia-Barriga 20574* (US).**Cundinamarca:** "Guaduas a Palmar", 6 Nov 1945, *Garcia-Barriga 11776* (US). **El Valle:** "Cordillera Central", 15 Oct 1962, *Figueiras 8093* (US). Loma de la Cruz, Nov 1938, Dryander 2215 (US). **Huila:** "East of Neiva", 31 Jul 1917, *Rusby 399* (US); 1 Aug 1917, *Rusby 1088* (US). La Plata, 11 Sep 1979, *Maguire 44191* (US). **Los Llanos:** El Meta, 12 Nov 1938, *Cuatrecasas 4766* (US). **Santander:** "Northern slope of

Mesa de Los Santos", 11 Dec 1926, *Killip 15411* (US). Quebrada Mensuli, 11 Jul 1953, *Langenhein 3280* (US)**. Tolima:** "East of San Lorenzo", 30 Dec 1917, *Pennel 3525* (US). **Valle del Cauca:** Jamundi, 25 Apr 1992, *Ramos 3629* (US). **Vichada:** "Parque Nacional Natural El Tuparro", 8 Mar 1985, *Zarucchi 3635* (US). **COSTA RICA. Guanacaste:** La Cruz, 21 Jan 1998, *Espinoza 1772* (NY). **Puntarenas:** Buenos Aires, 1892, *Tonduz 4945* (P), 22 Nov 2005, *Rodríguez 9751* (NY), 22 Nov 2005, *Santamaría 3451* (NY); 24 Nov 2005, *Solano 2920* (NY); 23 Mar 2006, *Rodríguez 10061* (NY). **San José**: Mora, 29 May 2003, *Kriebel 3311* (NY). **CUBA.** S.l., 1860-1864, *Wright 2516* (NY, P). **Cienfuegos:** Aguada de Pasajeros, 17 Feb 2002, *Greuter 25900* (NY). Cumanayagua, 12 Apr 1994, *Acevedo-Rodríguez 6425* (NY); 25 Feb 2009, *Greuter 26972* (NY). Cienfuegos, 17 Jul 1974, *Areces-Mallea 25104* (NY). La Veja, 3 May 1932, *Roíg 6084* (NY). Yaguaramas, 20 Feb 2009, *Greuter 26846* (NY). **Las Villas:** Motembo, 13 Apr 1954, *Liogier 3999* (NY). **Santa Clara:** Buenos Aires, 18 Mar 1929, *Jack 7122* (NY, P), 8 Apr 1928, *Jack 5997* (P). Cienfuegos, 26 Feb 1896, *Combs 711* (NY, P). La Magdalena, 24 Apr 1905, *Baker 4961* (NY); 27 Mar 1920, *Luna 377* (NY). Lomas de Banao, 9 Jan 1920, *Luna 6* (NY). Lomas Los Helechales, 10 Aug 1915, *León 5391* (NY). Lomas Seladas,13 Aug 1913, *León 4039* (NY). Manacas, 1 Jul 1941, *Howard 5501* (NY). Motembo, 28 Jun 1923, *Ekman 16860* (NY). San Blas, 1 Mar 1928, *Jack 5755* (P). Sancti Spiritus, 22 Jul 1918, *León 7840* (NY). Sopapo, 4 Aug 1936, *Smith 3333* (NY). Trinidad, 10 Mar1910, *Britton 5338* (NY); 29 Mar 1942, *Gonzales 652* (NY); 1 Jul 1958, *León 18458* (NY). Yaguaramas, 8 Feb 1924, *Ekman 18403* (NY). **ECUADOR.** S. l., *Drake s. n.* (image US-2588206 A), s.d., *Poortmann s.n.* (P05291144). **El Oro:** Portovelo, 22 Nov 1946, *De La Rue s.n.* (P05291146). **Morona-Santiago:** Gualaquiza, 1 Nov 1986, *Neill 7392* (NY, US). Portovelo, 6 Oct 1918, *Rose 23379* (US). **Zamora-Chinchipe:** El Tablón, 12 Oct 1988, *Harling 25165* (US). **EL SALVADOR. San Miguel:** San Antonio, 25 Apr 1958, *Allen 6868* (NY). **FRENCH GUIANA.** s.l., s.d. *Soubirou s.n.* (P- P05291186, P-P05291187), 1842, *Melinon 242* (P), 1938, *Prieur* s.n. (image US 00606197) (US); 1840, *Leprieur s.n* (G- 256584/6, P-05291175), 1863, *Leprieur 71* (P). Pariacabo, Aug 1961, *Schnell 11119* (P). Cayenne, s.l., 1857, Sagot s.n. (P-05291170), 20 Jul 1921, *Broadway 729* (US); 15 Nov 1980, *Cremers 6896* (P, US); 17 Sep 1984, *Prevost 1624* (US); 27 Dec 1986, *Cremers 9540* (MG, NY); 4 Nov 2004, *Martin 403* (NY). Ariane, 11 May 2007, *Granville 17347* (P). Ilê de Cayenne, 16 Oct 1981, *Prevost 1136* (P), 11 Sep 1992, *Bordenave 167* (P). "Kourou", 1956, *Hoock s.n.* (IAN 159845); 2 Dec 1966, *Oldeman 2261* (IAN, P, US). 18 Sep 1977, *Sastre 5987* (P). **Cedex:** 27 Jul 2009, *Delnatte 1951* (P). **GUATEMALA. Baja**

Verapaz: San Miguel Chicaj, 21 Mar 2001, *Förther 10863{18}* (NY). **GUYANA.** s.l., 1837, *Schomburgk 259* (P), 1840, *Schomburgk* 1063 (P) Dec 1842, *Schomburgk 1069* (US), 1868, *Schomburgk 33* (P). "Oreaka Savannah", Sep 1979, Thurn s.n. (P- P05291147). "Villa de Upata", 1864, *Grosourdy 18* (P). **Atabapo:** "Cerro Huachamacari", 5 Mar 1980, *Huber 4994* (US). "Sabana de Shimada-Wochi", 4 Nov 1983, *Huber 8350* (US). "Sabanas de Cucurí", Feb 1992, *Chaviel 460* (US). **Cuyuni-Mazaruni:** Pakaraima, 13 Nov 1992, *Hoffman 3368* (NY, US). Imbaimadai, 30 Nov 2002, *Redden 324* (NY). **Gunns:** Essequibo River, 26 Sep 1989, *Jansen-Jacobs 1834* (NY, P, US). **East Berbice-Correntyne:**19 Dec 1986, Pipoly 9433 (P, US). **Potaro-Siparuni:** Kato Village, 2 Jun 1995, *Mutchnick 1476* (NY, US). Pakaraima, 20 Jan 1993, *Henkel 933* (US); 4 Feb 1993, *Henkel 1197* (US); 13 Jul 1994, *Henkel 5589* (NY, US); 28 May 1995, *Mutchnick 1397* (US). "Rupununi": 9 Feb 1994, *Jansen-Jacobs 3614* (P, US). **Upper Demerara-Berbice:** 14 Aug 1993, *Henkel 2553* (US).**Upper Takutu-Upper Essequibo:** 9 Feb 1985, *Jansen-Jacobs 90* (NY). **JAMAICA.** s.l., 1850, *Alexander s.n.* "Cinchona", 13 Jan 1908, "*J, Botanical Department" 10073* (P). **Clarendon:** Bog Hole, 6 Jan 1955, *Proctor 9714* (NY). Chapelton, 18 Sep 1906, *Underwood 3356* (NY); 18 Sep 1906, *Underwood 3369* (NY). Clarendon Park, 24 Sep 1908, *Britton 3786* (NY). Kellits, 2 Mar 1903, *Fawcett 8464* (NY); 2 Dec 1915, *Harris 12269* (NY, P); 8 Jan 1958, *Yuncker 17919* (NY). Mason River, 10 Oct 1969, *Wurdack 2622* (NY); 1 May 1982, *Bretting J-2* (NY). Upper Clarendon, 28 Sep 1912, *Harris 11205* (NY). **Cockpit:** Oxford, 13 Sep 1906, *Britton 690* (NY). **Saint Ann:** Moneague, Dec 1949, *Prior s.n.* (NY); 27 Jan 1938, *Hunnewell 15323* (NY); 2 Nov 57, *Yuncker 17277* (NY). **Saint Mary:** 13 May 1987, *Judd 5317* (NY). Castleton, 10 Apr 1903, *Maxon 851* (NY). **Westmoreland:** Prospect Hill, 13 Sep 1900, *Thompson 7952* (NY). **MEXICO.** S. l., 1859, *Cuming s.n* (G 256582/5). "Yaliaca", 25 Apr 1899, *Langlassé 1010* (P). **Guerrero:** Mar 1985, *López 85-3-13* (NY). **Oaxaca:** s.l, s.d., *Sale s.n.* (P-P05157096), *Emi s.n.* (P-P05157098), 14 Apr 1970, *MacDougal s.n.* (NY). **Tabasco:** 8 Aug 1975, *Davidse 9379* (NY). Balancan, 9 May 1939, *Matuda 3083* (NY). **NICARAGUA. Chontales:** Juigalpa, 27 Aug 1983, *Nee 27565* (NY). **Zelaya:** Regíon Autonmica Atlantica del norte, Mar 1994, *Reveal 7333* (NY). **PANAMA. Bocas Del Toro:** Jul 1982, *Him 581* (NY). **Chiriquí:** Boquete, Jul 1959, *Stern 1204* (NY). **PANAMÁ:** Campana, 13 May 1980, *LeDoux 2633* (NY); Jan 2005, *Penneys 1679* (NY). **PARAGUAY. Amambay:** Parque Nacional Cerro Cora, Nov 1983, *Hahn 1744* (NY, US). **Canendiyu:** Ype-Jhú**,** 12 Jan 1971, *Bernardi 19475* (US). **,** Sierra de MAracayú, s.d., *Hassler 4936* (P), s.d., *Hassler, 5175* (P). **PERU. Amazonas:** Mendoza, 29 Aug 1963, *Woytkowski 8283* (US).

Cajamarca: Jaén, 30 Jul 1994, Leiva 1220 (US). "Cordeillére Del Parco", 23 Sep 1961, *Friedberg 617* (P). "Route de Chingozales", 16 Sep 1961, *Friedberg 562* (P). San Ignacio, 19 Sep 1981, *Sagástegi 10282* (US). **Cuzco:** s.d., *Gay 2140* (P). **Huánuco:** Pampayacu, 19 Jul 1923, *Macbride 5103* (US). **Junin:** 9 Jun 1929, *Killip 24777* (RB, US). La Merced, 10 Aug 1923 *Macbride 5520* (US); 23 Sep 2007, *Pennington 1900* (NY); 2 Oct 2007, *Pennington 2002* (NY). **Lambayeque:** San Roque, Jan 1930, *Williams 7649* (US). **Loreto:** Gran Pajonal, 15 Jun 1976, *Scott 876* (US). **Madre De Dios:** Tambopata, 13 Aug 1988, *Nuñez 9800* (US); 5 June 1997, *Santibañez 8962* (NY). **San Martín:** "Alto Rio Huallaga", Dec 1929, *Williams 5678* (US). Lamas, Dec 1929, *Williams 6330* (NY). 16 Sep 1937, *Belshaw 3480* (NY, P). Mojobamba, s.d., *Mathews s.n.* (P-P05291202). Tarapoto, Jun 1855, *Spruce 4265* (NY). Tocache, Dec 1929, *Williams 5678* (NY). **SURINAME. Sipaliwini:** 22 Oct 1968, *Oldenburger ON321* (NY). **Zanderij:** 26 Sep 1958, *Donselaar 135* (US). **TRINIDAD AND TOBAGO. Trinidad:** "Mount Saint Benedict", 30 Apr 1933, *Broadway 9192* (P). **Tobago:** Buenos Ayres, 9 May 1919, *Broadway s.n.* (image US 01100290, P-P05291200) (US); 11 May 1920, *Broadway s.n.* (image US 01100288, P-P05291198). "Piaco Savannah", 24 Apr 1933, *Williams 12873* (NY). **VENEZUELA.** S. l., s.d., *Otto 193* (US); S. l., s.d., *Otto 995* (US). "Guamitas", 3 May 1938, *Williams 10056* (US). **Amazonas:** Atures, 13 Apr 1978, *Davidse 14928* (US). "Campamento Yutajé", 13 Jun 1996, *Michelangeli 323* (US). La Esmeralda, 28 Jan 1975, *Ferrigni 29E* (NY). Puerto Ayacucho, 18 May 1840, *Williams 12985* (US). "Rio Ventuari", 16 Feb 1951, *Cowan 31490* (US). "Vecindades de Simarawochi", 18 Apr 1973, *Steyermark 106971* (US). **Apure:** Pedro Camejo, 10 May 1977, *Davidse 12979* (US), 15 Feb 1978, *Davidse 14109* (P). Puerto Páez, 4 May 1946, *Velez 2682* (US). **Aragua:** "Entre la Quebrada Rio Hondo y Choroní", 30 Apr 1972, *Steyermark 105860* (US). **Barinas:** "Road Barinas San Cristobal", 16 Dec 1966, *Bruijn 1359* (US). **Bolívar:** Canaima, Jun 1996, *Michelangeli 316* (NY, US); Jun 1997, *Michelangeli 459* (NY). Ciudad Bolivar, 13 Apr 1988, *Stergios 11818* (NY). Ciudad Piar, 7 Apr 1981, *Liesner 11289* (NY); Apr 1994, *Delgado 2174* (NY). "Cuenca media del Rio Paragua", 13 May 1987, *Stergios 10089* (US). "Gran Sabana", 24 Apr 1988, *Liesner 23754* (P). "Karaurin Tepui", 2 May 1988, *Liesner 24136* (US). Piar, May 1986, *Fernandez 2778* (US)."Rio Cotinga", 15 Dec 1954, *Maguire 40259* (IAN, US). San Ignacio de Yuruani, 9 Apr 1988, *Liesner 23041* (NY, US). **Carabobo: "**Cuesta de Yuma", 29 Apr 1971, *Guevara 4417* (US). Guacara, 22 Nov 1980, *Rojas 2842* (P). **Distrito Federal:** "Around Caracas", 8 May 1917, *Pittier 7138* (US); 10 Apr 1921, *Pittier 9448* (US); 8 May 1921, *Pittier 9514* (US). Caracas, 1917, *Curran 1087* (US); 24 Nov

1938, *Williams 69* (NY, US). "Near Galipan", 25 Oct 1921, *Pittier 107* (US). "Zaguara", Jul 1939, *Tamayo 560* (US). **Falcón:** Bolívar, 31 Aug 1985, *Huber 10816* (US). **Lara:** Barquisimeto, 22 Feb 1980, *Sobel 2069* (US). La Piedad, Apr 1930, *Saer d'Heguert 396* (NY). Morán, 22 Jan 1984, *Luteyn 9355* (NY). **Mérida:** Pueblo Nuevo, 1 Jul 1966, *López-Palacios 1335* (P). **Miranda:** Los Teques, Dec 1917, *Pittier 7607* (US); Apr 1928, *Pittier 12972* (US). **Portuguesa:** Araure, 8 June 1985, *Ortega 2672* (US); 31 Dec 2001, *Michelangeli 805* (NY). **Sucre:** "Valley of Cocollar", 28 Apr 1945, *Steyermark 62359* (US). **Táchira:** La Fundación, 23 Mar 1985, *Thomas 60712* (US). "Complejo Hidro-elétrico Uribante-Caparo", 17 Jul 1996, *Michelangeli 364* (NY, US). Uribante, 19 Jun 1990, *Dorr 7077* (NY). **Trujillo:** Mendoza, 29 Nov 1 922, *Pittier 11007* (US). **Zulia:** Colón, 27 Apr 1979, *Bunting 7265* (US). Machiques, 20 Jun 1980, *Davidse 18349* (NY). "Miranda-Bolívar", 4 Feb 1980, *Bunting 8630* (US).

FIGURE 12. Distribution of *Miconia albicans*.

Illustration:—Baumgratz (2006): 615, fig. 8., Berry et al. (2001): 436 (Fig. 323).

Habitat, distribution and ecology:—*Miconia albicans* is widely distributed in the Neotropics, occurring from Mexico and the Caribbean islands to southern Brazil. It occurs in areas of open vegetation, such as the Gran Sabana in Venezuela, Amazonian white-sand

vegetation (sometimes called *campina*) and in cerrado (where it is common and abundant). It also occurs in rocky fields and in caatinga. On the Brazilian coast it occurs on the edges of forests and in disturbed areas where it grows in large populations.

Discussion:—*Miconia albicans* differs from the other shrubby species by the dense, whitish indument on the adaxial surface of young leaves, the glabrous petals margins and the completely white stamens with connective appendages that form a skirt-like shape. The bluish green, ripe fruit is also a characteristic of this species, which only occurs in *M. albicans* and *M. lourteigiana*. These species also have amorphous indument and an inflorescence that is a thyrse, but differ by the leaf base (acute in *M. lourteigiana vs.* obtuse to cordulate in *M. albicans*) and the connective appendages (ventrally bilobed in *M. albicans vs.* cordate in *M. lourteigiana*). In addition, *M. albicans* is usually a shrub and *M. lourteigiana* is usually a tree that can become 15 m tall.

FIGURE 13. A-C. *Miconia albicans*. A. Fertile branch. B. Inflorescence. C. Inflorescence with ripe fruits. (Pictures A and C: C. R. Boelter).

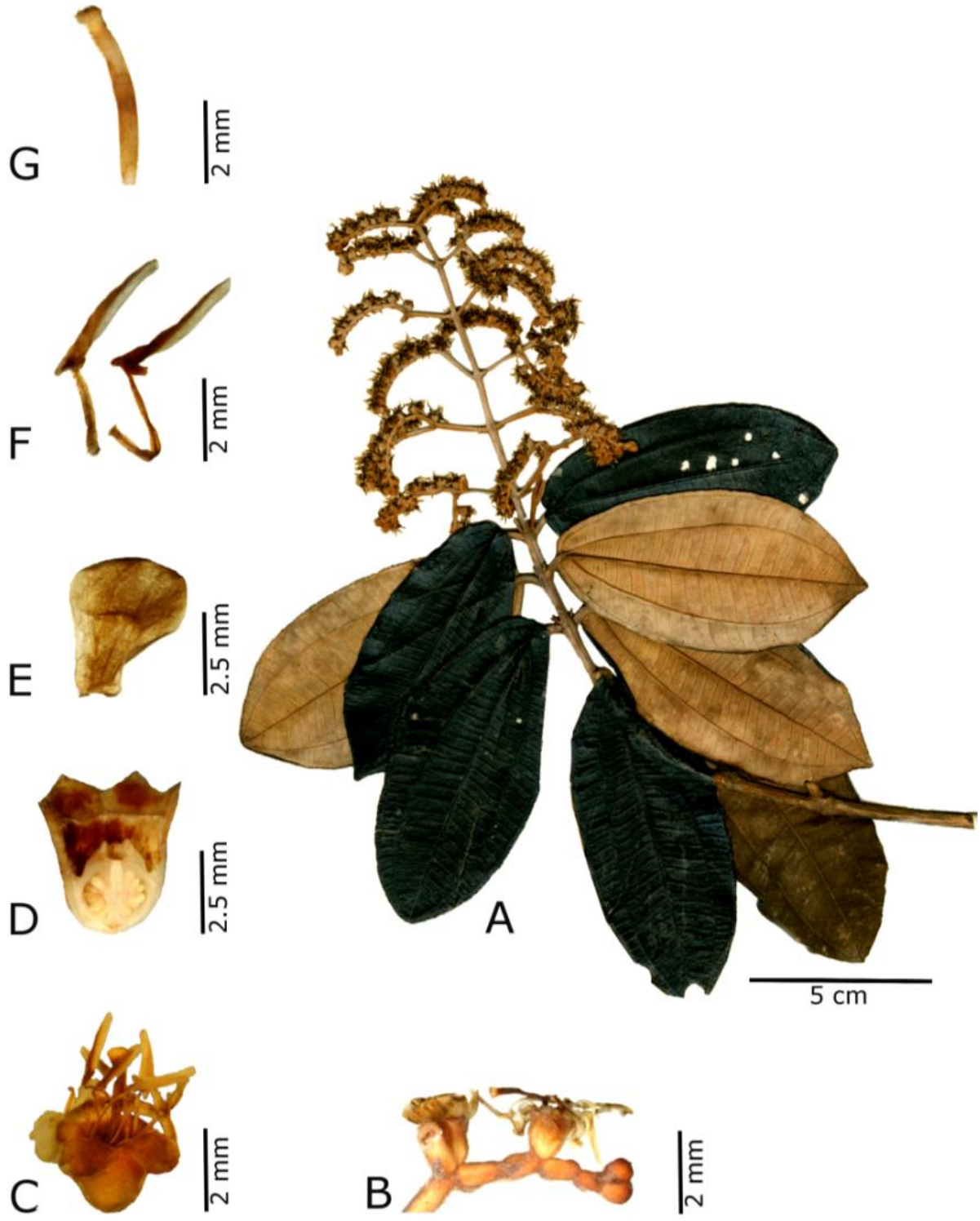

FIGURE 14. A-G. *Miconia albicans*. A. Fertile branch (*Swainson s.n.,* K-K000833035). B. Inflorescence branch C. Flower. D. Hipanthium in longitudinal section with ovary. E. Petals F. Stamens (D, F: *Santos 252*, NY). G. Style (B, C, E G: *Heringer 93*, NY).

2. *Miconia alborufescens* Naudin, Ann. Sci. Nat., Bot., Ser. 3 16: 160 (1850). Acinodendron alborufescens (Naudin) Kuntze, Revis. Gen. Pl. 2: 950 (1891). Type:—BRAZIL. Minas Gerais. Lectotype designated here: *Claussen 154* (P!); isolectotypes: BR!, G!, NY!

Miconia arirambae Huber, Bull. Soc. Bot. Genève 6: 192 (1914). Type:—BRAZIL. Pará. Holotype: *Ducke 8089* (MG!)

Miconia cachimbensis Brade, Arch. Jard. Bot. Rio de Janeiro 16: 14 (1959). Type:—BRAZIL. Lectotype designated here: *Pereira 1779* (RB!); isolectotype: IAN!

Treelets up to 2 m high; branches, petioles and inflorescence densely covered by brownwish stellate hairs. Branches rounded. Petioles 0.3–1.5 cm long. Blades 2.6–14 x 1.7–7.5 cm, cordate, apex acute to slightly acuminate, base cordulate to cordate, margin entire to slightly crenulate in the superior half, adaxial surface of young leaves densely covered by stellate trichomes, in the mature leaves glabrous; abaxial surface densely covered by amorphous whitish trichomes; longitudinal nerves 5, with an additional faint, marginal pair, basal. Panicles (1.8) 7–33.4 x (0.7) 8–22.3 cm, terminal, branches bifid subscorpioid to glomerulate, 0.5 cm long – 1.7 cm diam.; bracts and bracteoles deciduous. Flowers 5-merous. Hypanthium 1.9–2.1 mm long, campanulate, externally covered by whitish stellate trichomes inner surface moderately covered by glandular trichomes 0.08–0.1mm long, torus with the same indument. Calyx inner lobes truncate, persistent in fruit, inner surface glabrous, tube 0.4–0.6 mm long, outer lobes 0.6–0.7 mm long, apex with a tooth. Petals 2.1–2.8x1.3–1.5 mm, margins glabrous. Stamens white, dimorphic, filaments in the antesepalous stamens 2.9–3 mm long, in the antepetalous 2.9–3.2 mm long, both glabrous; connectives prolonged below the thecae 0.8–1 mm long in the antesepalous and 0.4–0.6 mm long in the antepetalous, with a dorsal rounded projection in the antesepalous, and two small, ventral lobules and a dorsal spur in the antepetalous; anthers 1.7–1.9 mm long in the antesepalous and 1.4–1.6 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined pore, 0.2–0.3 mm diam. Ovary 1.2–1.7 mm long, 1/2 adherent to the hypanthium, 3-locular, apex granulose-glandulose. Style 3.7–5.1 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, 4–4.7 mm diam., reddish to black when ripe, 10–15 seeds.

Additional specimens examined:—S.l., 1841, *Blanchet 3309* (P). **BOLÍVIA. Santa cruz:** Chiquitos, 22 Oct 1994, *Caballero 3461* (NY). Velasco, 29 Oct 1995, *Rodrigues 569* (NY, US); 1 Nov 1995, *Foster 583* (NY). 2 Nov 1995, *Foster 566* (NY). **BRASIL. s.l.: s.d,**

Blanchet 3309 (W), *Claussen s.n.* (P-P05206304), *Glaziou 12699* (BR). **Amazonas:** Cacau Pirêra, 18 June 1975, *Prance 23510* (K, MG, NY, US); 9 Sep 1975, *Anderson 211* (NY). Manaus, 20 March 1981, *Renner 751* (INPA); 26 July 1981, *Renner 261* (INPA, US); 20 Apr 1984, *Renner 890* (MG). Presidente Figueiredo, 23 Aug 1949, *Fróes 25121* (IAN, US). **Bahia:** Abaíra, 7 Feb 1992, *Harley 51056* (NY); 7 Feb 1992, *Lughadha 51056* (RB); 28 Oct 1992, *Ganev 1383* (RB); 3 Nov 1993, *Ganev 2387* (RB). Andaraí, 7 Dec 2007, *Guedes 14233* (NY). Botumirim, 20 Nov 1992, *Mello-Silva, 719* (RB). Catolés, 8 Feb 2006, *Santos, 776* (NY). "Fazenda Brumadinho", 6 Nov 1988, *Kral 75533* (P). Lagoinha, 6 March 1974, *Harley 16848* (P, RB); 1 November 1979, *Mori 12943* (NY, US); *Rocha 310* (NY, RB). Palmeiras, 28 Dec 1994, *Guedes 1450* (RB). Piatã, 8 Nov 1988, *Kral 75567* (NY, US). Rio de Contas, 27-Mar-1977, *Harley 20051* (NY, US); 11 Dec 1988, *Harley 27113* (K, NY, US); 15 Nov 1998, *Silva 193* (RB); 19 Nov 2000, *Baumgratz 736* (RB); 26 Feb 2006, *Paixão 741* (NY). Rui Barbosa, 16 Oct 1978, *Faria 7* (RB). Seabra, 24 Feb 1971, *Irwin 30915* (NY, US). Umburanas, 6 March 1974, *Harley 16848* (NY, US); 11 Apr 1999, *Queiroz 5337* (NY, RB). **Ceará:** "Planalto do Araripe", 10 Aug 1948, *Duarte 1359* (RB, US). "Serra do Araripe", Oct 1958, *Schnell 9431* (P-P04827135, P04827136) **Goiás**: 1896, *Glaziou 21389* (BR, K). Cocalzinho de Goiás, 1 Nov 1965, *Irwin, 9720* (K, NY, US); 24 Nov 2007, *Delprete 10402* (NY, RB). Cristalina, 16 Feb 1965, *Heringer 10485* (NY, US); 10 Jun 2002, *Mendonça, 4772* (RB). "Entre Morro Redondo e Manoel João", 1898, *Glaziou 21389* (P). Mossâmedes, 12 Oct 1996, *Gomes-Klein, 3190* (RB). Serra Dourada, 1968, *Rizzo 4345* (RB). **Mato Grosso:** "Serra Ricardo Franco", 25 Sep 1978, *Windish 2160* (US). Sinop, 3 Oct 1985, *Thomas 4167* (INPA, K, MG, NY, US). **Minas Gerais:** s.l., 1816, *Saint-Hilaire 165* (P), 1892, *Glaziou 19332* (BR, K). "Biriri", 30 Mar 1892, *Glaziou 19332* (P). Conceição do Mato a Dentro, 17 May 1990, *Arbo 4300* (K). Diamantina, 16 Nov 2007, *Saavedra 536* (RB); 15 Dec 2011, *Araújo 218* (RB). Grão Mogol, 3 Sep 1985, *Cavalcanti 8303* (US); Mariana, 2 Feb 1971, *Irwin 29637* (NY, P, US). Jaboticatubas, 24 Nov 1965, *Eiten 6822* (K, NY, US); 6 Aug 1972, *Hatschbach 30004* (NY, US). João Pinheiro, 5 Nov 1961, *Rizzini s. n.* (RB). Pirapora, 13 Oct 1962, *Pabst 7113* (US). Santana do Pirapama, 5 Mar 2009, *Zapi 1730* (RB). **Pará:** Itaituba, 12 Aug 1979, *Silva 300* (MG). Monte Alegre, 6 Nov 1987, *Ferreira 9475* (K, MG, NY, US); 23 Jan 1997, *Silva 846* (MG). 21 Apr 2006, *Rocha 454* (IAN, MG). Novo Progresso, 15 Sep 1975, *Pereira 1795* (IAN, RB); 17 Feb 1977, *Kirkbride 2865* (BR, INPA, MG, NY, RB, US); 6 Nov 1977, *Prance 24922* (MG, NY, RB, US); 21 Aug 1979, *Silva 345* (MG). Oriximiná, 26 May 1957, *Egler 234* (MG); 8 Jun 1980, *Martinelli 6864* (INPA, NY, US); 23 Dec 1996, *Ducke 14369*

(RB). “Rio Jamaracarú”, 26 May 1957, *Black 57-19520* (IAN).”Rio Maró”, 22 Nov 1952, *Pires 4387* (IAN). Santarém, 5 Jul 1989, *Sanaiotti 73* (INPA, US); 13 Oct 2012, *Meirelles 859* (RB); 14 Oct 2012, *Meirelles 876* (UEC); 15 Oct 2012, *Meirelles 882* (UEC). “Serra do Cachimbo”, 14 Sep 1975, *Pereira 1776* (IAN). Terra Santa, 16 Sep 1968, *Soares 461* (INPA). “**Rio de Janeiro” (*but probably wrong label):**10 Feb 1882, *Glaziou 12699* (P). **Roraima:** Auaris, 5 Feb 1969, *Prance 9599* (INPA, K, MG, NY, US). Boa Vista, 11 Sep 1951, *Black 51-13445* (IAN). **GUYANA. Amazonas:** Yutaje, 30 Jan 1953, *Maguire 35038* (US). **Cuyuni-mazaruni:** Imbaimadai, 21 Oct 1951, *Maguire 32182* (US); 2 Jul 2004, *Clarke 12374* (NY, US); 29 Jul 2010, *Wurdack 5550* (NY); Waleliwatipu, 29 May 1990, *McDowell 2936A* (US); 29 May 1990, *McDowell 2950* (NY). **Mazaruni-potaro:** Pakaraima, 21 Jun 1986, *Pipoly 7926* (NY, P, US). **Upper Takutu-Upper Essequibo:** 2 Oct 1993, *Henkel 3307* (NY). **VENEZUELA. Amazonas:** Atabapo, 16 Feb 1981, *Guanchez 597* (US); Nov 1989, *Yanez 259* (US). Atures, 27 Feb 1982, *Huber 6293* (US). Rio Negro, 14 Feb 1984, *Liesner 15917* (NY, US). **Bolívar:** Canaima, 16 Feb 1964, *Agostini 249* (NY, US). Cedeño, 23 Mar 1987, *Guanchez 4664* (US). “Cerro Bolívar”, 24 Feb 1953, *Wurdack 34373* (US). “Cerro Guaiquinima”, 20 January 1977, *Steyermark 113324* (US). El Dorado, 8 Dec 1972, *Wurdack 2841* (US). El Pauji, 10 Nov 1985, *Liesner 19841* (US). Piar, 6 Mar 1983, *Huber 7391* (NY). 17 Jun 1985, *Huber 10590A* (NY, US). “Rio Paragua”, 13 May 1987, *Stergios 11253* (NY). “Serranía Parú”, 16 Feb 1951, *Cowan 31490A* (US).

FIGURE 15. Distribution of *Miconia alborufescens*.

Illustration:— Berry *et al.* (2001):437 (Fig. 325).

Habitat, distribution and ecology:—*Miconia alborufescens* is widely distributed. It occurs from Venezuela to the state of Minas Gerais, Brazil, in open vegetation and several biomes. In the Amazon, it occurs in savanna around the Guiana Shield and in campinas. It is very common in cerrado and restricted to the highest elevations of Atlantic Forest in Brazil in the Espinhaço Range.

Discussion:— *Miconia alborufescens* was previously included in sect. *Glossocentrum* due to its glomerulate inflorescences. In a molecular phylogenetic study (Meirelles et al. in prep) it was shown to be closer to species in the albicans clade. It differs from the other species in this group by the panicles with scorpioid branches and very congested (Fig. 16 B) to glomerulate (Fig. 16 A and E) flowers. The branches can be scorpiod making it similar to *M. albicans*, which often occurs in the same environments. These two species can be distinguished by blade shape (cordate in *M. alborufescens vs.* oblong to ovate in *M. albicans*), connective appendages (slightly bilobed in *M. alborufescens vs*. conspicuously bilobed and skirt-like in *M. albicans*) and color of the ripe fruits (reddish in *M. alborufescens vs.* bluish green in *M. albicans*).

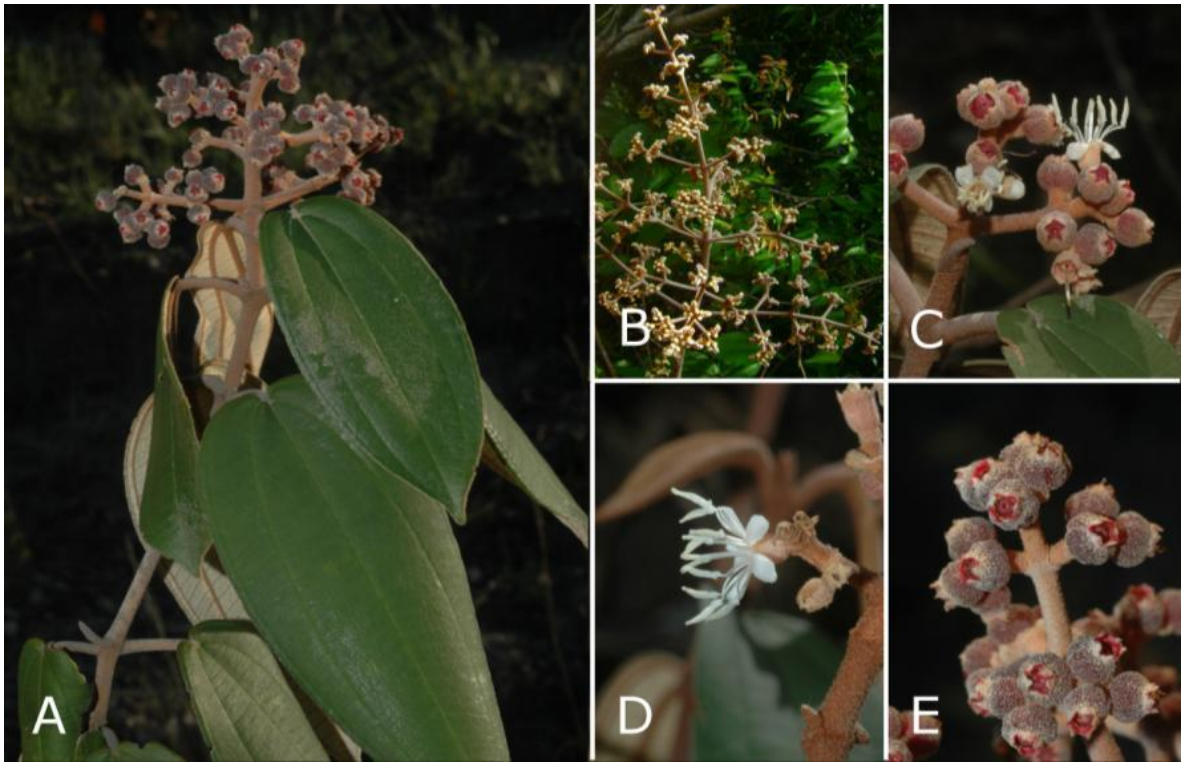

FIGURE 16. A-E. *Miconia alborufescens*. A. Fertile branch. B. Panicle. C. Inflorescence branch. D. Flower. E. Fruits (Pictures: A, C, D, E: R.Goldenberg).

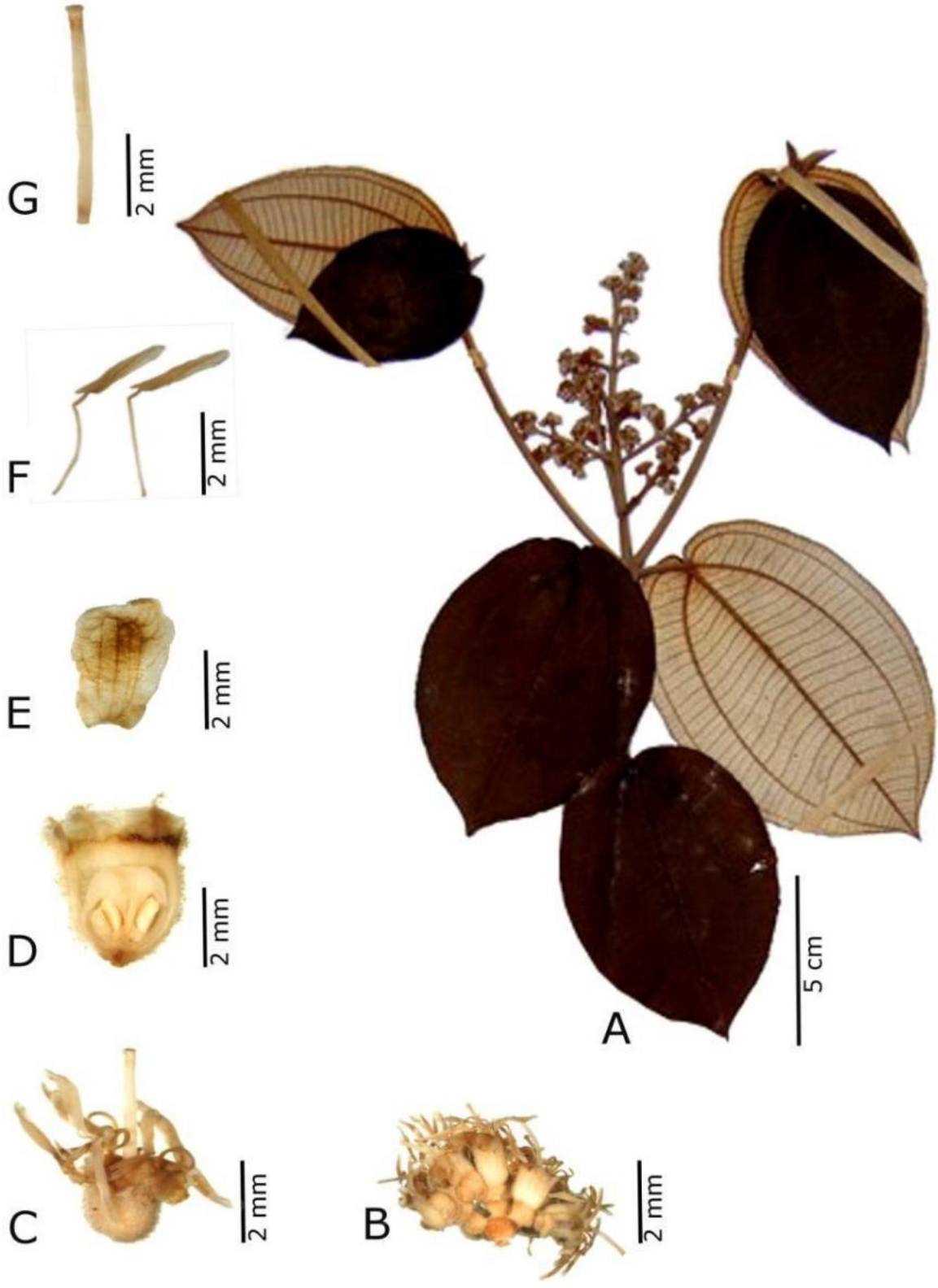

FIGURE 17. A-G. *Miconia alborufescens*. A. Fertile branch (*Meirelles 876*, UEC). B. Inflorescence branch. C. Flower. D. Hypanthium in longitudinal section with ovary. E. Petal. F. Stamens. G. Style (B-G: *Mori 12943*, NY).

3. *Miconia argyrophylla* DC., Prodr. 3: 181 (1828). Melastoma argyrophyllum Schrank & Mart. ex DC., Prodr. 3: 181 (1828), pro syn. Acinodendron argyrophyllum (DC.) Kuntze, Revis. Gen. Pl. 2: 950 (1891). Type:—BRAZIL. Pará. Lectotype designated here: *Martius s.n.* (M!).

Miconia longistyla Steud., Flora 27: 724 (1844). Type:—SURINAME. Lectotype designated here: *Hostmann 1177* (P!); isolectotypes: MO-image!, NY!, U-image!

Miconia argyrophylla var. *attenuata* Cogn. in Martius, Fl. bras. 14 (4): 296 (1887). Type:—FRENCH GUIANA. Lectotype designated here: Sagot 224 (BR!); isolectotypes: GDC!, K!, P!, S-image!, US!

Treelets 2 m up to trees 10 m high; branches quadrangulars, petioles and inflorescence densely covered by amorphous brown trichomes. Branches quadrangulars. Petioles 1–3.5 cm long. Blades 12–20 x 7.5–10 cm, oblong to lanceolate, apex acuminate to atenuate, base acute to rounded, margin entire to slightly dentate in the superior half, adaxial surface glabrous, abaxial densely covered by amorphous canescent trichomes, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 6.5–9.5 x 3.3–5.5 cm, terminal, branches bifid secund subscorpioid, 0.9 –3 cm long; bracts deciduous and bracteoles persistent. Flowers 5-merous. Hypanthium 1.6–2.3 mm long, campanulate, externally covered by whitish stellate trichomes, inner surface and torus glabrous. Calyx outer lobes triangulars, deciduous in fruit, inner surface glabrous, tube 0.2–0.5 mm long, outer lobes 0.5–0.9 mm long, apex with a tooth. Petals 2.1– 2.6 x 0.7–1 mm, margins glandular-ciliate. Stamens white, slightly dimorphic, filaments in the antesepalous stamens 2.3–3 mm long, in the antepetalous 1.5–2.8 mm long, both glabrous; connectives prolonged below the thecae ca. 0.4 mm long in the antesepalous and not prolonged in the antepetalous, with a “skirt-like” rounded projection sometimes bearing a stipitate gland ventrally in the antesepalous, and two small ventral lobules and a dorsal small spur in the antepetalous; anthers 1.7-2.8 mm long in the antesepalous and 2.1–2.8 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined pore, ca. 0.2 mm diam. Ovary 1.4–1.6 mm long, 1/2 adherent to the hypanthium, 3-locular, apex granulose-glandulose sometimes with projections like a crown. Style 6.4–6.7 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, 5.5–5.8 mm diam., orange to dark purple when ripe, 25–37 seeds.

Additional specimens examined:—BOLIVIA. La Paz: Mapiri, May 1886, *Rusby 2248* (US). **BRAZIL.** s.l.: *Martius, s.n.* (G-DC), 1831-1833, *Riedel 236* (NY), *Spruce 1787* (K), s.d., *Warming 2201* (P). **Acre:** Cruzeiro do Sul, 13 Apr 1971, *Prance 11783* (INPA), 19 Apr 1971, *Prance 12117* (INPA). Xapurí, 5 Jan 1999, *Ehringhaus 882* (NY, UPCB). **Amapá:** Oiapoque, 4 Dec 1984, *Mori 17181* (MG). "Parque Nacional das Montanhas do Tumucumaque", *Lobão 1149* (IAN). "Região de Maracá", 29 Sep 1982, *Rosa 4330* (NY). Tartarugalzinho, Nov 2005, *Costa Neto 2020* (MG). **Amazonas:** s.l., 17 Set 1949, *Froés 25264* (IAN), *Trail 263* (P). "Above mouth of Rio Bracinho", 11 Sep 1973, *Prance 17717* (INPA, NY). "Autaz-mirim", 14 Jun 1973, *Loureiro 38883* (INPA) Barcelos, 8 Feb 1984, *Prance 28898* (INPA, MG, RB), 8 Jul 1985, *Cordeiro 183* (INPA, NY), 12 Jul 1985, *Prance 29515* (INPA, MG, NY). Boca do Acre, 28 Oct 1975, *Monteiro s.n.* (INPA). Borba, 23 Jun 1983, *Hill 12808* (INPA, MG, NY, RB). Carauari, 15 Oct 1980, *Lisboa 1819* (MG). Manaus, 6 Jul 1874, *Traill 149* (K), 13 Aug 1874, *Traill 262 (*K), 10 Jul 1936, *Ducke 232* (RB), Aug 1942, *Sandeman 2213* (K), Oct 1958, *Schnell 9283* (P), 10 May 1962, *Rodrigues 4435* (INPA, P), 26 Jan 1963, *Eiten 5198* (K, NY, US), 3 Sep 1964, *Hatschbach 11366* (MBM, UPCB, RB) , 6 Sep 1968, *Prance 7196* (INPA, K, MG, RB, US), 9 Sep 1973, *Steward P17651* (INPA, MG, NY, US), 11 Jul 1974, *Rodrigues 9490* (INPA), 31 Aug 1976, *Carreira 142* (INPA), 21 Sep 1976, *Nascimento 11* (INPA), 16 Sep 1977, *Nascimento 254* (INPA), 23-Sep-1977, *Ribamar 385* (INPA), 7-Aug-1979, *Benson 10346* (NY, UEC), 8-Aug-1979, *Ferreira 56* (MG), 22 Aug 1981, *Renner 299* (US), 17 Mar 1982, *Renner 841* (INPA), 22 Apr 1982, *Renner 843* (INPA), 28 May1984, *Renner 951* (INPA, MG), 21 Apr 1986, *Labroy 91* (P), 23 Oct 1988, *Boom 8504* (NY, P), 25 Feb 1992, *Nee 42633* (NY), 8-Mar-1992, *Dick 27* (MBM, NY), 17 Jul 1992, *Nee 43010* (MBM, NY), 5 Oct 1994, *Sothers 199* (MG), 12-Feb-1995, *Sothers 311* (INPA), 18 Aug 1995, *Nee 46227* (MBM, NY, RB), 9 Oct 2003, *Anjos 4* (INPA), 20 Jul 2006, *Zartmann 6055* (INPA), 11 Jun 2011, *Meirelles 633*(INPA), 10 Aug 2013, *Corrêa 238* (INPA). Maués, 27 Jul 1983, *Ferreira 4265* (MG, NY, RB). Presidente Figueiredo, 20 Sep 1986, *Ferreira 8222* (MG, NY), 26 Nov 2006, *Zartmann 6252* (INPA), 27 Jun 2007, *Silva 1290* (INPA). "Rio Negro", 11Sep 1928, *Tate 116* (NY). Santa Isabel do Rio Negro, 16 Aug 1999, *Roosmalen 1222* (INPA). "Serra Aracá", 23 Feb 1977, *Rosa 1619* (MG, NY, US), 4 Mar 1984, *Pipoly 6805* (INPA, NY, UEC) "Rio Cuieras", 26 Sep 1971, *Prance 14901* (INPA, K, MG, NY, P, US), Sep 1972, *Pires 186* (INPA), 13 Sep 1973, *Prance 17879* (MG, NY), 14 Sep 1973, *Prance 17853* (MG, NY, W), 16 Sep 1973, *Prance 18011* (MG, US), "Uruá", 31 Sep 1977, *Silva 2227* (INPA). Bahia: Uruçuca, 1 Jul 1991, Thomas 6990

(NY). Maranhão: Turiaçú, 30 Nov 1978, *Rosa 2749* (MG). Mato Grosso: Cláudia, 12 Jul 1997, *Nave 1503* (UPCB). Novo Mundo, 1 Jun 2007, *Sasaki 1717* (K). "Rio Juruena", 9 Sep 1977, *Silva 6004* (RB). Sinop, 25 Sep 1985, *Ferreira 6230* (MG, US). Pará: s.l., Aug 1851, *Spruce 1787* (P). Belém, 7 Oct 1966, *Pires 10222* (IAN), Dec 1969, *Harley s.n.* (K). 'Ilha do Mosqueiro", 3 Nov 1929, *Killip 30495* (NY)."Jupatituba", 14 Oct 1898, *Guedes 1607* (RB, MG). "Monte Dourado", 13 Nov 1978, *Cavalcante 3353* (MG). Tomé-Açú, 29 Oct 1979, *Silva 5116* (MG). Roraima: Alto Alegre, 17 Jun 1986, *Hopkins 798* (INPA, MG), 18 Jun 1986, *Hopkins 850* (INPA, MG, NY), 5 May 1987, *Milliken 182* (NY). Caracaraí, 9 Nov 2010, *Cangani 79* (INPA, NY), 11 Nov 2010, *Cangani 95* (INPA, NY), 27 Jan 2011, *Cangani 135* (INPA), 22 Jul 2011, *Holanda 454* (INPA). "Serra Tepequém", 18 Feb 1967, *Prance 4521* (K, NY). **ECUADOR.** Zamora-Chichipe: "Parque Nacional Podocarpus", 6 Aug 2000, *Cotton 1566* (NY)."**ECUADOR AND PERU"**. *Grisar s.n.* (P-P05313640, P05313645). **GUYANA.** Berbice-Corentyne Region, 13 Apr 1989, *McDowell 2223* (INPA). "Pedrero", 1840, *Schomburgk 925* (K, P, US, W). Upper Mazaruni River, 22 Sep 192, *De La Cruz 2306* (US), 22 Sep 1922, *De La Cruz 2052* (RB, US). Upper Takutu-Upper Essequibo, 23 Feb 1990, *Acevedo-Rodriguez 3376* (US), 22 Sep 1993, *Henkel 3110* (US). **FRENCH GUIANA.:** s.l., 18 Sep 2005, *Delnatte 121* (US). Bassin de la Litani, 15 Sep 1994, *Granville 12492* (US). "Camp Eugéne", 6 Feb 1995, *Granville 12778* (P). Cayenne, 1820, *Leprieur s.n.* (G-DC), 1838, *Leprieur s.n.* (P-P05313587, P05313589, P05313590), 1863, *Mélinon 313* (P, US), 15 Dec 1914, *Benoist 1594* (P), 10 Nov 1983, *Cremers 8248* (US), 20 Dec 1984, *Cremers 8388* (P). "Fleuve Ouaqui", 8 Jul 1973, *Granville 1742* (P). Mana, 1854, *Mélinon 59* (P). Pic Matecho, 2001, *Hequet 990* (P, US). "Piste de Saint Elie", 22 Nov 1979, *Prévost 824* (P, US), 23 Oct 1980, *Prévost 1076* (P), 16 Dec 1984, *Barthelemy 157* (P), 15 Oct 1985, *Prévost 2073* (INPA, P), 15 Sep 1987, *Hahn 3693* (P, US), 3 Aug 1997, *Prévost 3352* (US), 7 Sep 2004, *Barrabé 207* (P, US). "Region of Sinnamary", 9 Nov 2004, *Martin 404* (NY), 9 Nov 2004, *Martin 414* (P). Saul, 22 Aug 1970, *Granville 605* (P). "Saut Lavillette", 24 Jan 1970, *Oldeman 2854* (P)."Saut Leodad track", 13 Nov 2004, *Martin 447* (NY). **SURINAME.** s.l., s.d., *Hostmann 1177* (K, P, W). 13 Dec 1924, *Boschwezen 6744* (RB, US). "Amakakondre", 20 Feb 1985, *Sauvain 287* (P, US). "Nassau Mountains", 3 Jan 1955, *Maguire 39110* (RB, US). "Saut Paloulou Icholi", 17 Sep 1994, *Granville 12547* (P, US). **TRINIDAD AND TOBAGO.** Trinidad: "St. Pat´s", 1 Jul 1960, *Snow (312)3* (US). Valencia, 26 Mar 1926, *Broadway 6055* (US). **VENEZUELA. Amazonas:** Atabapo, 10 Jan 1988, *Stergios 11556* (NY, US). Atures, 6 Jul 1969, *Bunting 3525* (US). Casiquiare, 10 Jan 1988, *Aymard 6416*

(RB). San Carlos de Río Negro, 1 Mar 1942, *Willyams 14559* (US). Yavita, 31 Jan 1942, *Willyams 14115* (US). **Bolívar:** "Del Medio Rio Oris', 13 May 1987, *Stergios 10728* (NY). "El Araguaney", 13 May 1987, *Stergios 10990* (P)."Karaurin Tepui", 27 Apr 1988, *Liesner 23944* (US). "Reserva Florestal Imataca", 19 Jan 1983, *Stergios 5388* (US). "Rio Caura", 30 Aug 1992, *Meier 2702* (US). **Zulia:** Colón, 27 Jun 1980, *Davidse 18726* (US). Perijá, 25 Feb 1982, *Bunting 10893* (US).

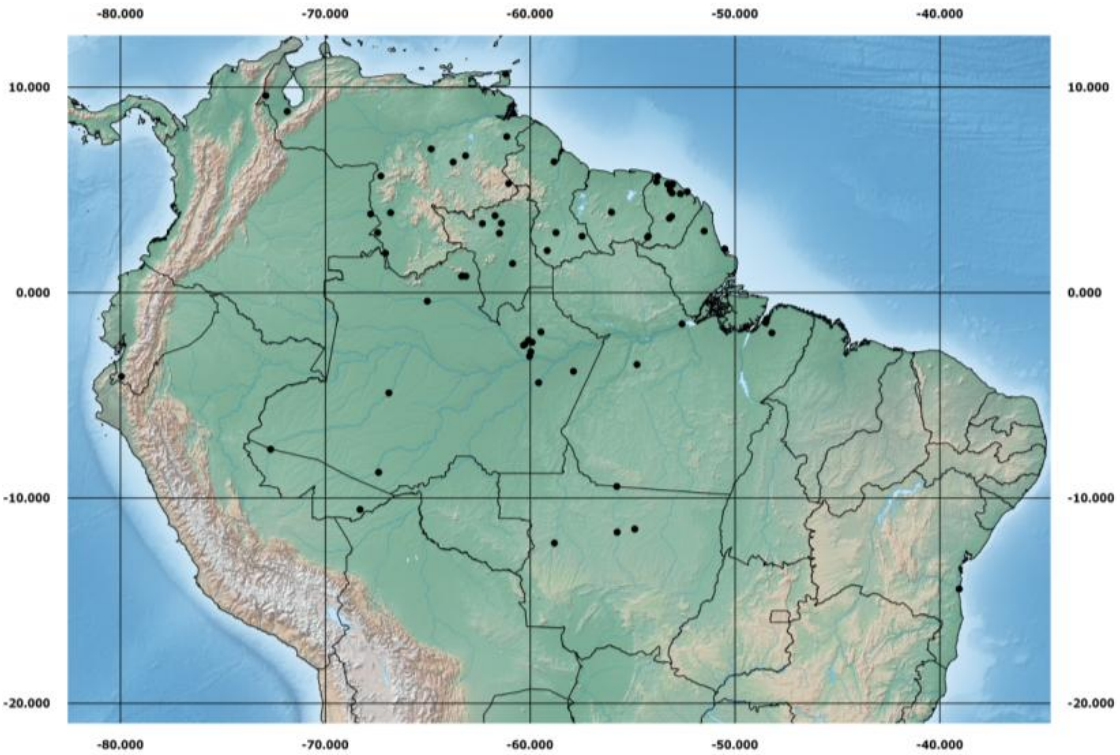

FIGURE 18. Distribution of *Miconia argyrophylla.*

Illustration:—Berry *et al.* (2001):437 (Fig. 326). Figures (19-20).

Habitat, distribution and ecology:—*Miconia argyrophylla* is widely distributed, occurring from Venezuela to the state of Mato Grosso Brazil, and from Ecuador in the Andes region to eastern Pará, Brazil. It is a common species in the vegetation around Gran Sabana in Venezuela and also in the campinaranas and terra firme forests in the Amazon.

Discussion:—Diagnostic characters of *Miconia argyrophylla* are quadrangular branches covered with a dense tawny indument, which is also present on the petioles and main veins on the abaxial surface of the leaves. On the abaxial blade surface, the dense amorphous indument is canescent, and tawny only on the main veins. Morphologically, this species is very similar to *M. pterocaulon*, which differs by the non-winged branches and tawny

indument. *Miconia argyrophylla* is also similar to *M. stenostachya* because these species have quadrangular branches, lanceolate leaves and glandular-ciliate petal margins. However, *M. argyrophylla* differs by its habit (tree), tawny indument, larger leaves, smaller flowers and white anthers (*vs.* yellow in *M. stenostachya*). The subspecies *gracilis* described by Wurdack is here considered a new species (new status) and has been given a new name (*Miconia mayarae*). A comparison between these two species is after the description of *M. mayarae* (Page 155).

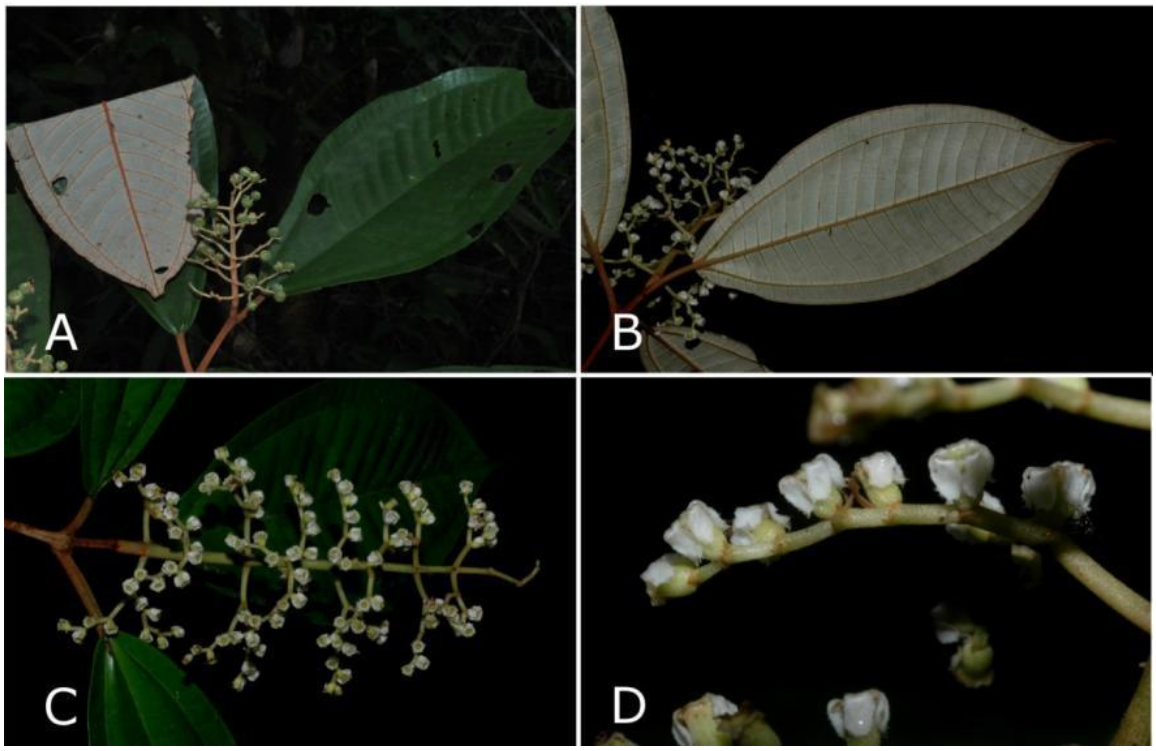

FIGURE 19. *Miconia argyrophylla*. A-B. Fertile branch. C. Inflorescence. D.Detail of the secund flowers. (Pictures A-D: R. Goldenberg).

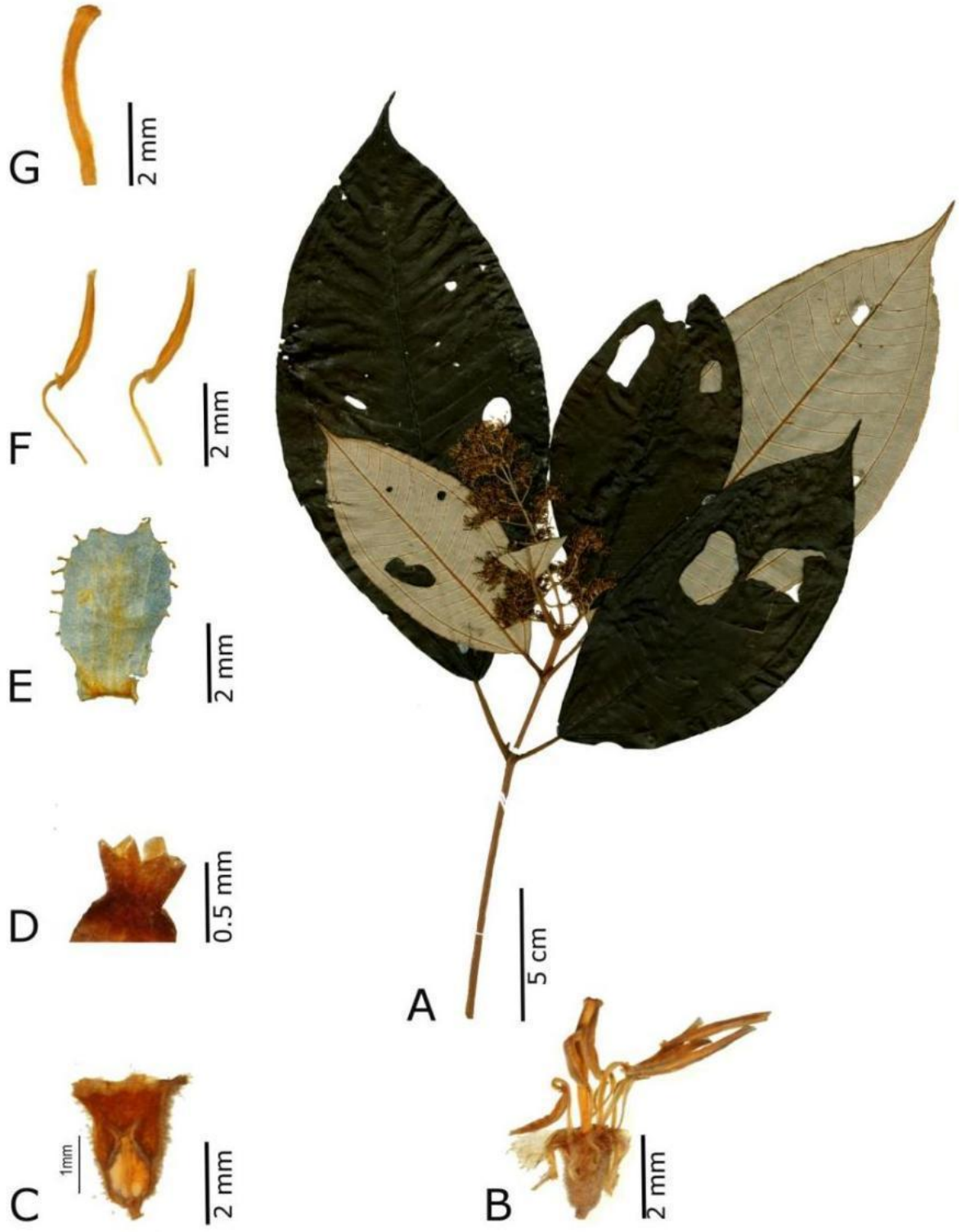

FIGURE 20. A-G. *Miconia argyrophylla*. A. Fertile branch. (*Sasaki 1717*, K). B. Flower. C. Hypanthium with ovary. D. Ovary apex. E. Petal. F. Stamens. G. Style (B-G:*Steyermark 124353*, NY).

4. ***Miconia astrocalyx*** Meirelles & R. Goldenb. *sp nov. in prep.* Type:—BRAZIL: Bahia. Holotype: *Meirelles & Fernandes 905* (UPCB!); isotypes: CEPEC!, HUEFS!, K!, MBM!, RB!, UEC!, US!

Shrubs up to 3 m high. Young branches, petioles abaxial surface of the leaves, and inflorescence densely covered by yellowish, sessile, stellate trichomes.Branches rounded. Petioles 0.8–1.6 cm long. Blades 7.5–10 × 3.5–5 cm, oblong, apex acute to slightly acuminate, base cordate, margin slightly crenulate, adaxial surface of young leaves densely covered by yellowish trichomes longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 4.5–10 × 3–4.5 cm, terminal, branches secund, bifidis with few-flowerd branches, ca. 1 cm long; bracts and bracteoles persistent.. Flowers 4-5-merous. Hypanthium 1–1.5 mm long, campanulate, externally covered by yellowish stellate trichomes, inner surface glabrous; with sparse glandular trichomes., torus glabrous. Calyx inner lobes ca. 1.2–2 mm long, triangular, persistent in fruit, inner surface glabrous but the basal line of the calyx lobes densely covered by simple trichomes, tube ca. 0.4 mm long, apex with a tooth up to 0.2 mm long. extending the inner lobes. Petals 3.5–4×3.1–3.3 mm, margins glandular-ciliate. Stamens, dimorphic, filaments in the antesepalous stamens 2.3–2.6 mm long, in the antepetalous 1.7–2 mm long, both glabrous; connectives not prolonged below the thecae, ventrally slightly bilobed and with a very small dorsal inconspicuous tooth; anthers 3.1–3.5 mm long in the antesepalous and 2.8–3 mm long in the antepetalous, oblong, with a single terminal pore, ca. 0.2 mm diam. Ovary ca. 1.6 mm long, 1/2 adherent to the hypanthium, 3–locular, apex with sparse glandular-stipitate trichomes. Style 3.5–4 mm long, straight, stigma punctiform, covered sparsely glandular-stipitate trichomes in the basal half. Fruits baccate, 4.2–4.6 mm diam., purple to black when ripe, 25–40 seeds.

Additional specimens examined:—BRAZIL. Bahia: Água Quente, 17 Dec 1988, *Harley et al. 27590* (K). Rio de Contas, 16 Jan 1974, *Harley et al. 15112* (K), 16 Jan 1974, *Harley et al. 15120* (K), 27 Mar 1977, *Harley et al. 20052* (K). "Serra do Marcelino", 2 Feb 1997 (fr), *Passos et al.4848* (HUEFS). "Estrada Rio de Contas para Marcolino Moura, km 18", Nov 2000, *Baumgratz 719* (RB), 2.6 km da cidade em linha reta, na estrada para Arapiranga, 27 Nov 2004, *Harley & Giulietti 55238* (UPCB). Goiás: Posse, Arredores, 8 Oct 1976, *Hatschbach 39074* (MBM, US).

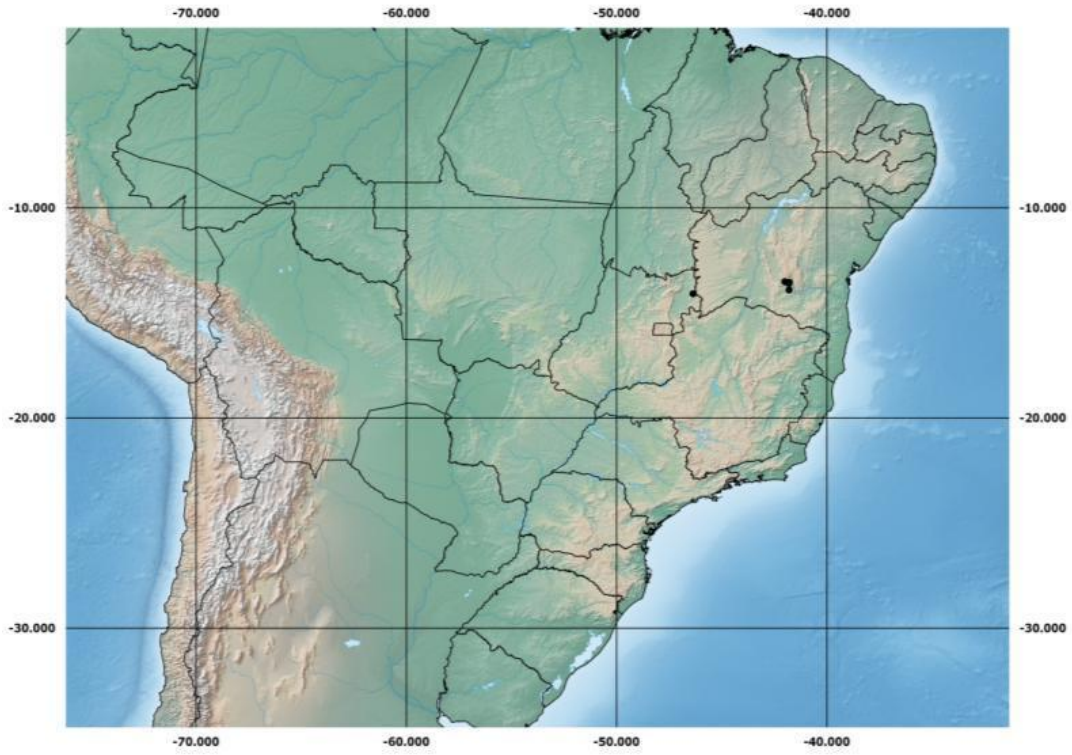

FIGURE 21. Distribution of *Miconia astrocalyx*.

Illustration:—Figures (22-23).

Habitat, distribution and ecology:—*Miconia astrocalyx* is endemic to Brazil where it grows in cerrado and dry grasslands, in shrubby vegetation on white-sand soils, at elevations between 1000–1175 m. It is restricted to the southwestern region of Chapada Diamantina, from Rio de Contas in the state of Bahia to Posse in the state of Goiás.

Discussion:—*Miconia astrocalyx* is a new species from the albicans clade. It is similar to *M. fallax* and *M. stenostachya* because these three species have glandular-ciliate petals and stamen connectives that are ventrally slightly bilobed. The features that distinguish them are the indument (yellowish and stellate in *M. astrocalyx vs.* whitish or grayish and amorphous in *M. fallax* and *M. stenostachya*) and length of the calyx lobes on the fruits (1.2–2 mm long in *M. astrocalyx vs.* 1.1–1.7 long in *M. fallax* and 0.8–0.9 long in *M. stenostachya*). *Miconia herpetica* DC. also occurs in the same region and has the same yellowish, stellate indument found in *M. astrocalyx*, but it differs by its glabrous petal margins, the skirt-like connective

appendages and deciduous calyx (*vs.* persistent in fruit in *M. astrocalyx*).

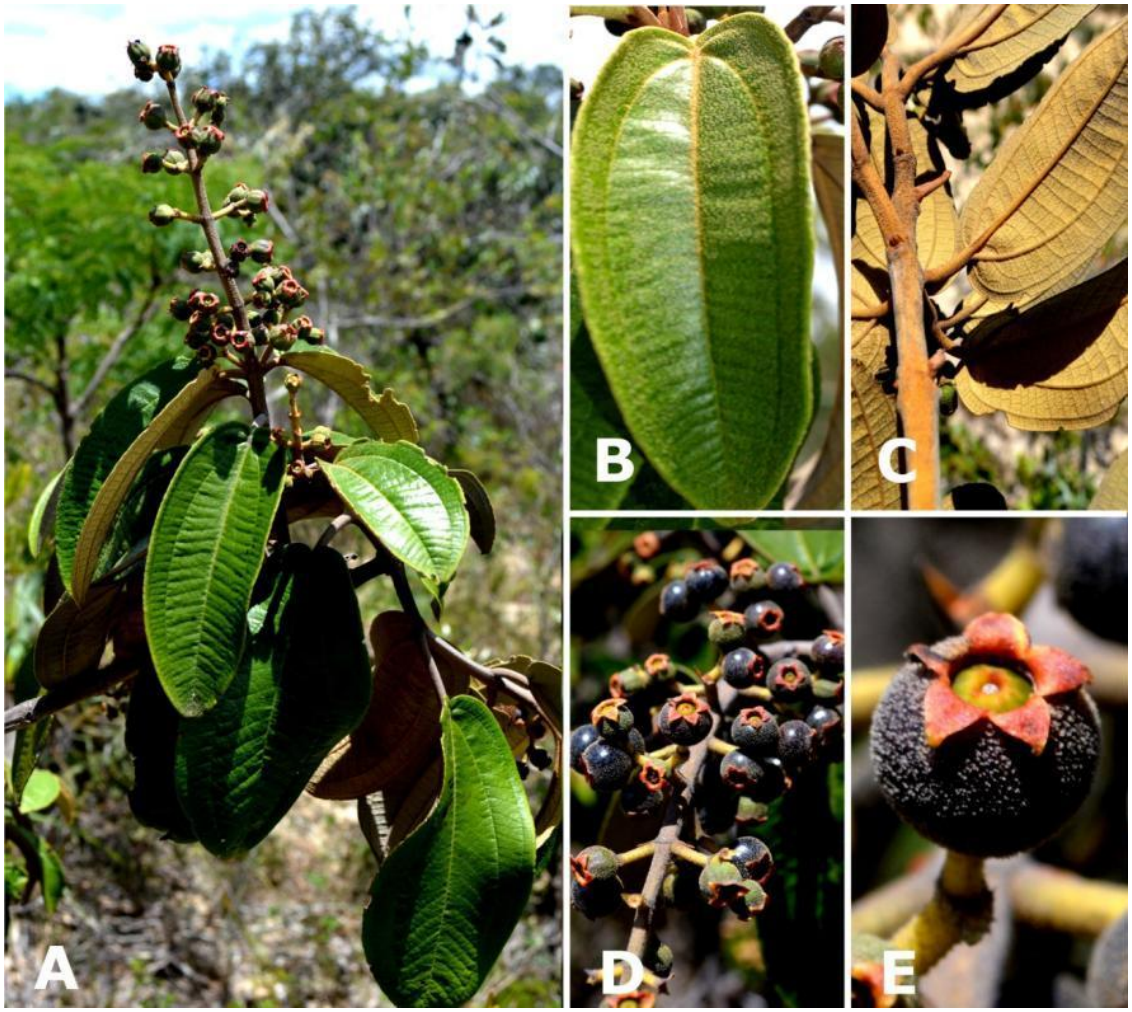

FIGURE 22. A-F: *Miconia astrocalyx.* A. Fertile branch. B. Adaxial surface of leaves. C. Branch and abaxial surface of leaf indument. D. Inflorescence with ripe fruits. E. Fruit with calyx lobes.

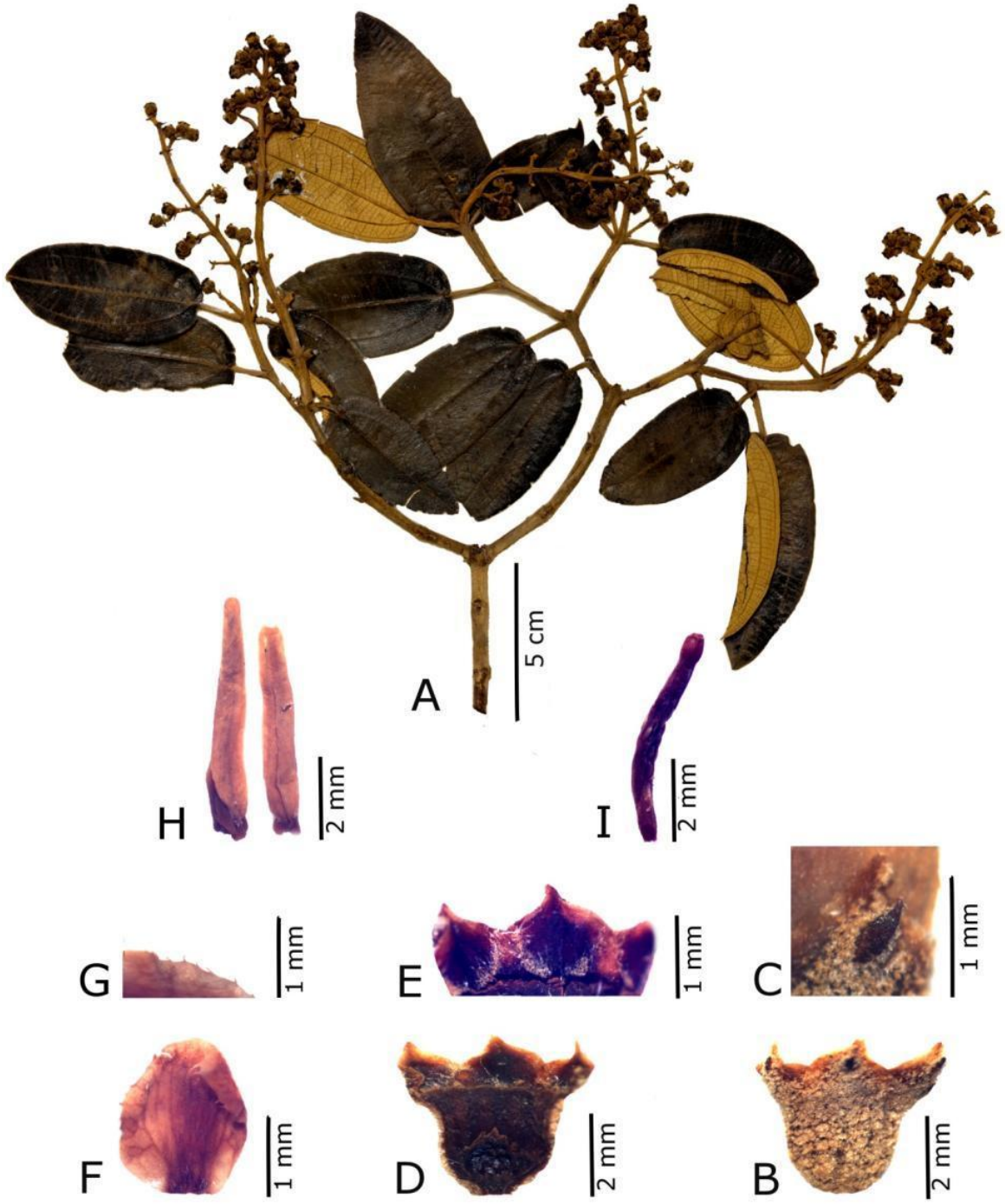

FIGURE 23. A-I. *Miconia astrocalyx*. A. Fertile branch. B. Hypanthium external surface. C. Detail of the external calyx teeth. D. Hypanthium inner surface. E. Calyx inner surface with the detail of indument in the petals insertion point. F. Petal. G. Detail of petal margin. H. Anthers. I. Style.

5. *Miconia fallax* DC., Prod. 3:181 (1828). *Acinodendron fallax* (DC.) Kuntze, Revis. Gen. 1:244 (1891). Pl. Type:—BRAZIL. Lectotype designated here: *Martius s.n.* (M!); isolectotype: GDC!

Shrubs to treelets up to 2 m high; branches, petioles, abaxial surface of leaves and inflorescence densely covered by whitish amorphous hairs. Branches rounded. Leaves sessile or with petioles with until 5 mm long. Blades 6.5–13.6 × 2.7–7.3 cm, ovate, apex rounded to acuminate, base rounded to cordate, margin entire to slightly crenulate in the superior half, adaxial surface glabrous, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 6.8–13 × 2.2–6.7 cm, terminal, branches bifid subscorpioid, 0.4–2 cm long; bracts and bracteoles persistent. Flowers 5-6-merous. Hypanthium 3.0–3.8 mm long, campanulate, externally covered by whitish amorphous trichomes inner surface and torus glabrous. Calyx inner lobes broad triangular with apex rounded, persistent in fruit, inner surface glabrous, tube 0.7–1.1 mm long, outer lobes triangular 1.1–1.3 mm long, apex with a tooth. Petals 4.5– 4.8 × 2.6–3.2 mm, margins glandular-ciliate. Stamens white with the anthers yellow, slightly dimorphic in size, filaments in the antesepalous stamens 4.2–4.9 mm long, in the antepetalous 3.2–3.3 mm long, both glabrous; connectives prolonged below the thecae ca. 0.1 mm long in the antesepalous and not prolonged in the antepetalous, with two small, ventral lobules in the antesepalous, and without appendages in the antepetalous but sometimes with a dorsal small spur; anthers 3.7–4.1 mm long in the antesepalous and 2.9–3.3 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined pore, 0.2–0.3 mm diam. Ovary 2.4–3.5 mm long, 1/3 adherent to the hypanthium, 3-locular, apex glabrous. Style 8.1–10.1 mm long, straight, stigma punctiform, glabrous. Fruits baccate, 2.8–5.5 mm diam., black when ripe, 40–45 seeds.

Additional specimens examined:—BOLIVIA. La Paz: "Nor Yungas", 26 Sep 1987, *Beck 13649* (US). Santa Cruz: Velasco, 1 Oct 1987, *Killeen 2744* (US). **BRAZIL.** s.l.: s.d., *s.c. 1199* (K, W), 1834, *s.c. 1201* (K), s.d., *s.c. 1202* (K), *s.c. 1599* (K). "Bras. Ocid." s.d., *Tamberlik s.n.* (W). **Bahia:** Jacobina, 1841, *Blanchet 3322* (NY, W). Rio de Contas, 28 Sep 1993, *Ganev 2256* (RB). **Ceará:** s.l., s.d., *Gardner 1605* (G, P). **Distrito Federal:** Brasília, 12 Oct 1965, *Heringer 10634* (NY, US), 12 Nov 1965, *Irwin 10214* (IAN, NY, US), 10 Dec 1965, Belém 1938 (IAN, NY), 12 Dec 1965, *Irwin 11235* (IAN, NY), 13 Dec 1965, *Irwin 8253* (IAN, NY, P), 24 Feb 1966, *Irwin 13136* (IAN, NY, US), 23 Jan 1972, *Kirkbride Jr. 1690* (NY), 6 Oct 1972, *Ratter R.2597* (NY), 8 Sep 1976, *Ratter R.3570* (NY, UEC), 6 Oct

1978, *Heringer 15587* (NY, UEC), 19 Aug 1980, *Fiedler 25* (UPCB), 19 Aug 1980, *Heringer 5334* (US), 19 Aug 1980, *Huber 7871* (NY), 26 Aug 1980, Granja e Barros 90 (NY), 26 Aug 1980, *Mendonça 146* (NY), 19 Sep 1980, *Kirkbride 1371* (NY, INPA) ,11 Feb 1981, *Kirkbride 1428* (NY, UPCB), 23 Sep 1986, *Kirkbride Jr. 5391* (INPA, NY, RB), 23 Aug 1990, *Azevedo 852* (US), 29 Aug 1990, *Azevedo 876* (P, UEC), 7 Jan 1992, *Souza 95* (RB), 23 Mar 1994, *Munhoz 83* (G), 21 Oct 1994, *Munhoz 199* (K), 1 Oct 1999, *Boaventura 491* (RB), 25 Sep 2006, *Vale 131* (RB), 2 Oct 2008, *Cervi 9358* (RB, UPCB), 15 Sep 2000, *Santos 518* (RB), 23 Nov 2000, *Gomes 111* (RB), 8 Dec 2000, *Brito 145* (RB), 16 Oct 2003, *Silva 885* (RB), 17 Jul 2004, *Lima 30* (UPCB), 2 Sep 2009, *Bringel 453* (RB). **Goiás:** Cavalcante, s.d., *Pohl s.n.* (NY). Cocalzinho, 24 Oct 2004, *Delprete 8923* (NY, RB). Cristalina, 10 Sep 1998, *Souza 21432* (UPCB). Ipameri, 28 Sep 1995, *Cavalcanti 1747* (NY). "Iter Matogrossense", 1891, *Moore 156* (NY). Luziania, 20 Apr 1982, *Heringer 18380* (K, US), 27 Sep 2007, *Cesare 147* (INPA). Mossâmedes, 29 Oct 2010, *Goldenberg 1481* (UPCB). "Serra Dourada", 18 Dec 1968, *Harley 11331* (K), 1969, *Rizo 4146* (RB), **Maranhão:** 30 Jul 1949, *Pires 1597* (IAN). Mirador, s.d., *Rodrigues 274* (UPCB). **Mato Grosso:** s.l., 8 Oct 1968, *Fonseca 1267* (IAN). "Bandeirante", 26 Aug 1963, *Hatschbach 32332* (US). Barra do Garças, 3 Sep 1968, *Eiten 8557* (K, NY, US), 8 Sep 1968, *Eiten 8608* (K). Chapada dos Guimarães, 11 Oct 1973, *Prance 18816* (INPA, K, NY, US), 20 Oct 1995, *Hatschbach 63652* (G), 8 Oct 1997, *Souza 20324* (RB). Cuiabá, Sep 1927, *Collenette 163* (K, NY). Diamantino, 18 May 1997, *Souza 16401* (RB). 22 May 1997, *Souza 16848* (RB). "Expedition base camp", 10 Sep 1968, *Argent 6894* (K, NY, P, RB, US), 23 Sep 1968, *Harley 10193* (K), 27 Sep 1968, *Harley 10284* (K, P), 14 Oct 1968, Harley 10653 (K, P, US). Garapú, 3 Oct 1964, *Irwin 6644* (NY, US). "Km 98-99 BR-364", 27 Sep 1988, *Kral 75128* (P). Nobres, 19 Sep 1985, *Ferreira 6102* (INPA, US), 19 May 1997, *Souza 16483* (RB). Nova Xavantina, 25 Sep 1967, *Argent 6532* (NY). "Path north from Base Camp", 8 Oct 1968, Harley 10540 (K, NY, RB), 8 Oct 1968, Harley 10548 (K, NY, P, RB). "Ribeirão Comprido", 6 Sep 1978, *Lima 114* (RB). Santo Antônio de Leverger, 27 Sep 1988, *Kral 75089* (NY), 12 Apr 1996, *Macedo 4607* (RB)."Serra de São Vicente", 27 Sep 1988, *Kral 75101* (NY, US). Tapuráh, 8 Jun 1997, *Souza 17382* (RB), 11 Jun 1997, *Souza 17709* (RB), 12 Jun 1997, *Souza 17841* (RB). **Mato Grosso do Sul:** Campo Grande, 10 Sep 1936, *Archer 171* (K, NY, US), 8 Nov 1996, *Ratter R7642* (K), 18 Sep 2000, *Resende 1152* (UPCB). Cassilândia, 27 May 1978, *Guimarães 240* (RB). "Santa Cruz" 11 Nov 1987, Ratter R5927 (NY). Santa Rita do Pardo, 20 Jun 1998, *Salvador 92* (RB). **Minas Gerais:** Belo Horizonte, Oct 1897, *Silveira s.n.* (RB149527), 23 Sep 1942, *Magalhães 2393*

(IAN), 3 Oct 1942, *Viégas 6863* (RB), 6 Sep 1945, *Williams 8052A* (US), 23 Oct 1955, *Roth s.n.* (RB561118), 16 Jan 2008, Ordones 1322 (UPCB). Botumirim, 29 Sep 1997, *Rapini 354* (US). Buenópolis, 13 Oct 1988, *Harley 24955* (K, NY, UEC, US). Datas, 9 Sep 1971, *Hatschbach 27495* (US). Diamantina 20 Sep 2005, *Almeda 9112* (UEC). "Estrada para Pirapora", 13 Oct 1963, *Pabst 7106* (US). Francisco Dumont, 22 Mar 94, *Sakuragi s.n.* (UPCB-51467). Gouveia, 13 Sep 1985, *Hatschbach 49606* (MG). Itabirito, 20 Oct 1974, *Badini s.n.* (RB378245). Lagoa Santa, 10 Sep 1945, *Williams 7431* (NY, US), 12 Aug 1993, *Toledo 401* (UPCB). "Milho Verde", 24 Oct 1998, *Nogueira s.n.* (UPCB-42750), 17 Sep 2005, *Almeda 9063* (UEC). Ouro Preto, *Badini s.n.* (RB378234). Paracatu, 30 Oct "20", *Queiroz 15066* (RB). Patrocínio, 29 Jan 1970, *Irwin 25619* (K, NY, RB, US). Perdizes, 24 Sep 1999, *Stehmann 2608* (UPCB). Sacramento, 18 Oct 1994, *Romero 1396* (US), 18 Oct 1994, *Romero 1400* (RB), 24 Sep 1995, *Romero 2705* (US), 1 Oct 1999, *Mello-Silva 1697* (RB, UPCB), 26 Mar 2009, *Caddah 411* (UPCB). São João del Rei, 23 Jun 1887, *Glaziou 16962* (BR, P). São Roque de Minas, 17 Oct 1997, *Nakajima 2895* (NY, RB), 30 Sep 1999, *Mello-Silva 1670* (NY, UPCB). Uberlândia, 12 Oct 1993, *Romero 506* (US), 13 Oct 1995, *Romero 3020* (US), 13 Oct 1995, *Romero 3023* (NY). "Villa Bom succesu", s.d., *Pohl 3393* (NY, W). **Pará:** s.l., 22 Nov 1952, *Pires 4386* (IAN), 17 Jun 1953, *Froés 30085* (IAN), 18 Aug 1955, *Black 55-18729* (IAN), Itaituba, 16 Nov 1978, *Silva 3769* (NY). Novo Progresso, 23 Aug 2003, *Silva 4066* (MG). "Rio Curuá do Norte", 27 Nov 1973, *Coelho s.n.* (INPA42152). Santarém, Nov 1849, *Spruce 374* (P), Mar 1850, *Spruce s.n.* (K-K000833172, NY, P-P05206633), 18-Aug-1955, *Black 55-18789* (NY), 15 Dec 1978, *Vilhena 311* (NY), 23 Feb 1986, *Ackerly 167.* (NY, UPCB, US), 27 Aug 1987, *Miranda 3* (INPA), 11 Mar 1988, *Miranda 65* (INPA), 17 Oct 2000, *Souza 1579* (IAN), 15 Oct 2012, *Meirelles 884* (UEC). **Paraíba:** Santa Rita, 23 Feb 1989, *Agra 704* (K). "Tabuleiro", 8 Feb 2004, *Barbeiro 2328* (UPCB). Piauí: 10 Feb 1984, *Emperaire 2472* (P, RB). **Rio Grande do Norte:** São José do Mipibu, 29 Dec 1975, *Bamps 5068* (NY, P, RB). **Rondônia:** Porto Velho, 14 Sep 1975, *Mota 13* (INPA). Vilhena, 2 Jan 1979, *Silva 4104* (NY), 24 May 1979, *Silva 4624* (RB), 26 Oct 1979, *Vieira 655* (INPA, NY, RB, US), 7 Nov 1979, Nelson 386 (INPA, NY), 29 May 1997, *Miranda 1506* (IAN, INPA, MG). **Roraima:** s.l., 27 Apr 1974, Pires 14347 (IAN), 28 Apr 1979, *Rodrigues 614* (IAN). Boa Vista, 18 Aug 1951, *Black 12720* (IAN), 20 Aug 1951, *Black 12766* (IAN), 30 Nov 1983, Amaral 1439 (K, NY, US), 5 Mar 2004, *Barbosa 115* (INPA). Bonfim, 1 Aug 1986, *Silva 602* (INPA, NY). Cantá, 7 May 2003, *Barbosa 15* (INPA). Caracaraí, 27 Apr 1974, *Silva s.n.* (US2777852), 18/03/1984, *Santos 744* (NY), 13

Mar 2008, *Ferreira 12905* (INPA), 12 Nov 2010, *Silva 106* (NY), 13 Nov 2010, *Silva 116* (NY), 13 Oct 2011, *Meirelles 732* (INPA), 19 Oct 2011, *Meirelles 758* (INPA, NY). "Estrada de Boa Vista para Cantá", 16 Sep 1993, *Miranda 117* (INPA). Mucajaí, 22 Jan 1967, *Prance 4023* (INPA). "Rio Maú", 19 Nov 1954, *Rodrigues 570* (INPA). "Serra do Sol", *Miranda 1154* (INPA). **São Paulo:** Altinópolis, 17 Sep 1977, *Leitão Filho 5934* (UEC, US). Botucatu, 21 Sep 1972, *Gottsberger 99R-1-21972* (US). Itirapina, 13 Sep 1962, *Felippe 76* (NY, RB, US), 13 Oct 1970, *Sendulsky 1025* (K), 10 Oct 1992, *Rodrigues s.n.* (UPCB), 21 Mar 2002, *Romão 779* (RB), 1 Jun 2010, *Caetano s.n.* (UEC, UPCB-68387). Luiz Antônio, 13 Aug 2002, *Bopp s.n.* (RB599269). Moji-Guaçu, 23 Sep 1960, *Mattos 8366* (US), 13 Sep 1961, *Handro 514* (US), 6 Aug 1980, *Mantovani 909* (NY), 15 Sep 1980, *Mantovani 941* (NY). Pratânia, 3 Sep 2002, *Carmello-Guerreiro 161* (UEC). Santo Antônio de Posse, 19 Aug 1980, *Gabrielli 11411* (K, NY). São Carlos, 10 Nov 1995, *Souza 9345* (RB). São José dos Campos, 27 Jan 1962, *Mimura 220* (K, NY, US), 6 Feb 1962, *Mimura 257* (K), 11 Sep 1962, *Mimura 541* (K, NY), 12 Sep 1962, *Mimura 565* (G, NY, US, W), 14 Oct 1964, *Eiten 5747* (G, K, NY, US). **Sergipe:** São Cristóvão, 15 Dec 2005, *Ribeiro 44* (RB). **Tocantins:** Filadélfia, 7 Jul 2005, *Lenza 651* (RB). **BRITISH GUYANA.** s.l., 1839, *Schomburgk 613* (BR, G, P, W). "Basin of Rupununi River", 15 Oct 1937, *Smith 2269* (P, US). Mackenzie, 17 Jan 1955, *Cowan 39260* (US). **Potaro-Siparuni:** Kato, 11 Mar 1989, *Hahn 5561* (NY, P). 2 Jun 1995, *Mutchnick 1478* (US). "Orealla savanna", 6 Nov 1946, *"B.G.For.Dept." 5404* (P). Roraima, 1842-1843, *Schomburgk 690* (G, W), 1842-1843, *Schomburgk 973* (G, P, W). **Rupunini:** Toroebaroe, 19 Nov 1987, *Jansen-Jacobs 1047* (NY, P, US). "Surama village", 1 May 1992, *Hoffman 1556* (NY). Upper Takutu-Upper Essequibo: "Essequibo region", 25 Jun 1989, *Gillespie 1827* (NY, US). **COLOMBIA.** Valle: Cerro de Tres Cruces,1 Dec 1947, *Bermúdez 17C849* (NY). **MEXICO.** s.d., s.c. 767 (W). **PARAGUAY.** Amambay: "Sierra de Amambay", Aug 1913, *Hassler 11332* (G, NY, P, W). **PERU.** Junín: San Ramon, 12 Jun 1929, *Killip 24775* (NY, US). **SURINAME.** "Sipaliwini savanna": "Brazilian frontier", 27 Nov 1968, *Oldenburger ON572* (NY) .**VENEZUELA. Amazonas:** "Campamento Yutajé", 24 Jun 1996, *Michelangeli 338* (NY). Puerto Ayacucho, 1942, *Williams 13821* (G, US). **Bolívar:** La Frontera, 1 Mar 1953, *Wurdack 34463* (US). Maripa, 21 Apr 1939, *Williams 11928* (NY). "Entre San Félix y Puerto Ordaz", 26 Jun 1964, *Steyermark 94283* (US). "Parguar", 12 Apr 1946, *Velez 2342* (US), 13 Apr 1946, *Velez 2379* (US). Raúl Leoni, 8 Jun 1992, *Diaz 999* (NY). "Represa Guri", 1 Apr 1981, *Liesner 11067* (NY). Roscio, 22 Jun 1983, *Huber 7556* (NY), 26 Jul 1983, *Huber 7871* (NY). **Delta Amacuro:** Tucupita 28 Mar 1979,

Davisdse 16256 (US).**"Guayana Venezolana":** Salte Hacha, Marc 1954, *Puig 2878* (US). **Sucre:** "Mochima Parque Nacional", 17 Apr 1980, *Sobel 2287* (US).

FIGURE 24. Distribution of *Miconia fallax*.

Illustration:—Berry et AL. (2001):344, (Fig. 343). Figures (25-26).

Habitat, distribution and ecology:—*Miconia fallax* is widely distributed in South America. It occurs in many different types of open vegetation, such as cerrado, fields and savanna. In the Amazon, it is known to occur in campinas, campinaranas and in the lavrado in state of Roraima, Brazil. Floral visitors have not been recorded for *M. fallax* in cerrado, which corroborates that the species is apomitic (Goldenberg & Shepherd 1998).

Discussion:—*Miconia fallax* belongs to a clade where the inflorescences are thyrses with secund subscorpioid branches and glandular-ciliate petals. It differs from the other species mainly due to its sessile or short-petiolate (≤0.5 cm long.), chartaceous leaves. The reproductive parts of this species are very similar to *M. stenostachya*; nevertheless, *M. fallax* has larger flowers with a longer hypanthium (3–3.8 mm long *vs.* 2.1–3 mm long) and longer petals (4.5–4.8 mm long *vs.* 1.5–4.1 mm long). Vegetatively, *M. fallax* has cylindric branches and *M. stenostachya* has quadrangular branches (see additional comment under *M. stenostachya*, Page 176).

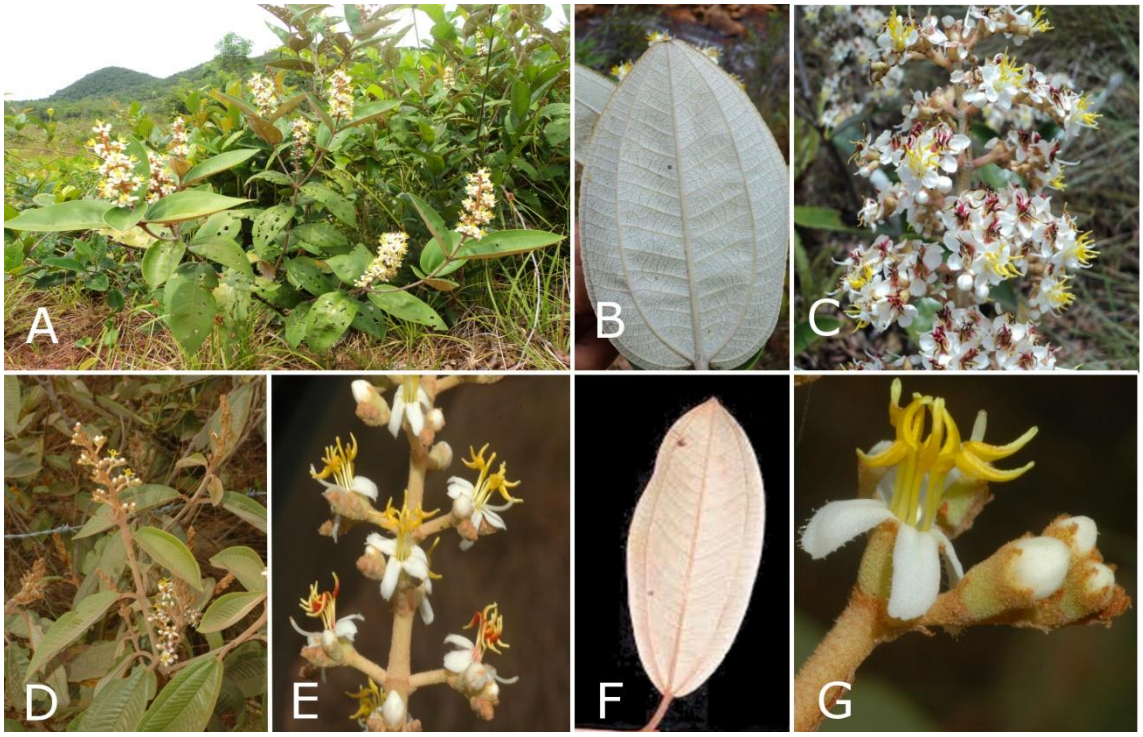

FIGURE 25. A-C. *Miconia fallax*. A. Habit. B. Leaf abaxial surface. C. Inflorescence. D-G. *Miconia stenosytachya.* D. Fertile branches. E. Detail of inflorescence. F. Leaf abaxial surface. G. Flower in the secund branch (Pictures B-C: C. Snak, D,E,G: R. Goldenberg, F: M. Engels).

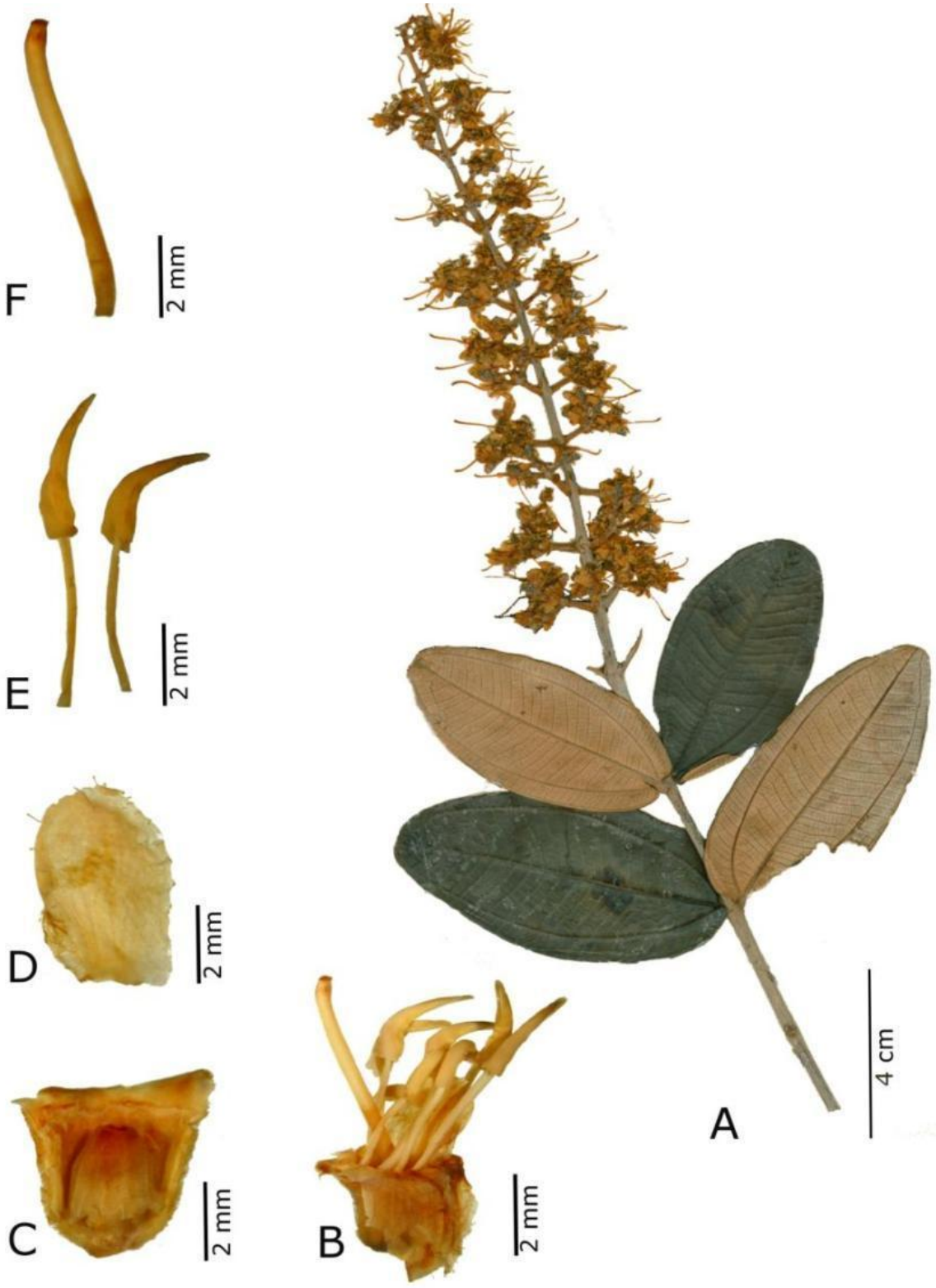

FIGURE 26. A-F: *Miconia fallax*. A. Fertile branch (*Argent 6894*, K). B. Flower. C. Hypanthium in longitudinal section with ovary. D. Petal. E. Stamens. F. Style (B-F *Harley 24955*, NY).

6. *Miconia herpetica* DC., Prodr. 3: 181 (1828). *Melastoma herpeticum* Schrank & Mart. ex DC., Prodr. 3: 181 (1828), *pro syn. Acinodendron herpeticum* (DC.) Kuntze, Revis. Gen. Pl. 2: 951 (1891). Type:—BRAZIL. São Paulo. Lectotype designated here: *Martius s.n.* (M! – barcode M0165585); isolectotypes: BR! (fragment), GDC! (fragment).

Miconia herpetica var. *acutifolia* Cogn. in Martius, Fl. bras. 14 (4): 287 (1887). Type:—BRAZIL. São Paulo. Lectotype designated here: *Martius s.n.* (M! barcode-M0165589).

Miconia nambyquarae Hoehne, Anexos Mem. Inst. Butantan, Secc. Bot. 1 (5): 131 (1922). Type:—BRAZIL. Mato Grosso. Lectotype designated here: *Kuhlmann 6800a* (SP); isolectotype: R fide Goldenberg *et al.* (2013), *syn. nov.*

Treelets up to 5 m high; branches, petioles and inflorescence densely covered by yellowish stellate hairs. Branches rounded. Petioles 0.6–3.2 cm long. Blades 3–13.4 × 1.8–5.8 cm, ovate, elliptic to lanceolate, apex attenuate to mucronate, base rounded to cordulate, margin entire to slightly crenulate in the superior half, adaxial surface of young leaves densely covered by stellate hairs, in mature leaves glabrous, abaxial surface densely covered by several layers of stellate whitish trichomes, longitudinal nerves 3, with an additional faint, marginal pair, basal to shortly suprabasal. Thyrses to panicles 2.8–18.5 × 2.3–7 cm, terminal, branches bifid subscorpioid, 0.7–2 cm long; bracts and bracteoles deciduous. Flowers 5-merous. Hypanthium 2.2–2.7 mm long, campanulate, externally densely covered by whitish stellate trichomes, inner surface and torus glabrous. Calyx inner lobes truncate persistent in fruit, inner surface glabrous, tube 0.4–0.7 mm long, outer lobes 0.9–1.2 mm long, broad triangular, apex with an inconspicuous tooth. Petals 3.1–4.6 × 1.2–2.3 mm, margins glabrous. Stamens white, dimorphic, filaments in the antesepalous stamens 3.4–4 mm long, in the antepetalous 2.9–3.6 mm long, both glabrous; connectives prolonged below the thecae 0.6–1.1 mm long in the antesepalous and 0.4–0.7 mm long in the antepetalous, with a dorsal rounded projection with two ventral conspicuous auricules with the margins crenate to fringed in the antesepalous, and two ventral auricules and a dorsal small spur in the antepetalous; anthers 3.6–3.8 mm long in the antesepalous and 2.9–3.3 mm long in the antepetalous, oblong, with a single terminal, ventrally to dorsally inclined pore, 0.1–0.2 mm diam. Ovary 1.3–1.5 mm long, 1/2 adherent to the hypanthium, 3-4-locular, apex glabrous. Style 6.2–8.2 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, 3–4.1 mm diam., black when ripe, 5–7 seeds.

Additional specimens examined:—BRAZIL. s.l., s.d., *s.c., s.n.* (P-P05314761), 1827, *Martius s.n.* (G-DC-G00310979). "Rio de Janeiro" 1882, *Glaziou 13386* (K). Bahia: Caetité, 1 Set 2006, *Sant´Ana 1283* (HUEFS, NY, RB, UPCB). Correntina, 1991, *Rezende 290* (K), 28 Jul 2004, *Fonseca s.n.* (UPCB 59735, 59736). Guanambi, 23 Jul 1980, *Silva 101* (MG, RB). Mato Grosso: Buriti, 20 Mar 1983, *Carreira 559* (INPA, MG). Canarana, 30 Set 1964, *Prance 59178* (K, NY, US). "Chapada dos Guimarães", 21 Mar 1981, *Jangoux 1415* (INPA, MG). Comodoro, 21 Ago 1999, *Ratter 8264* (K). Cuiabá, junho de 1927, *Smith 329* (K, NY). "Expedition Base Camp", 23 Sep 1968, *Harley 10190* (K, NY, P, RB, US), 8 Oct 1968, Harley *10538* (K, NY, P, RB), 08 Out 1968, *Harley 10540* (K), Garapú, 2 Out 1964, *Irwin 6566* (K, NY, RB, US). Nova Marilândia, 18 May 1997, *Souza 16362* (UPCB). Paranatinga, 18 Ago 1990, *Macedo 2739* (INPA). "Parecis", 3 Ago 1978, *Pires 16358* (BR, NY, UEC). Ribeirão Cascalheira, 31 May 1997, *Goldenberg 432* (UEC, UPCB, US). Vila Bela da Santíssima Trindade, 9 Jun 1984, *Cid 4388* (K, MG, NY, US). Minas Gerais: s.l., s.d., *Claussen s.n.* (P-P05314760, K-K000828725), s.d., *Pohl 2937* (NY). "Caramdahy", 12 Jun 1882, *Glaziou 13836* (P). Carbonita, 28 May 2008, *Valente 2349* (UPCB). Montes Claros, 25 May 1994, *Sevilha s.n.* (UEC-UEC092964). "Nossa Senhora da Piedade", 1816-1821, *Saint-Hilaire 1633* (P). Rondonia: Fazenda Cachoeira, 19 Ago 1999, *Ratter 8250* (K). Pimenta Bueno, 23 Abr 2013, *Bigio 794* (RON). Vilhena, 4 Set 1963, *Maguire 56568* (K, NY, US), 23 May 1979, *Silva 4592* (MG, NY), 23 May 1979, *Silva 4615* (INPA, MG), 18 Apr 1977, *s.c., s.n.* (RB-RB 178949), 10 Jun 1984, *Cid 4491* (INPA, K, NY, US), 29 May 1997, *Miranda 1505* (INPA, MG), 1 Jun 1997, *Miranda 1415* (INPA, MG), 16 Jun 1997, *Miranda 1302* (INPA, MG).

FIGURE 27. Distribution of *Miconia herpetica*.

Illustration:—Figure 28.

Habitat, distribution and ecology:—*Miconia herpetica* is endemic to chavascal (a type of cerrado) vegetation in Brazil.

Discussion:—*Miconia herpetica* differs from the species with glabrous petals by its dense, yellowish, stellate indument, and by its connective appendages (in antesepalous stamens) with two ventral auricles with crenulate to fringed margins. *Miconia nambyquarae* is indicated as a synonym of *M. herpetica*. Hoehne distinguished *M. nambyquarae* from related species based on the indument, 5-nerved leaves and the long panicles. However the leaf features of *M. herpetica* vary continuously along the distribution of this species. To the west (states of Mato Grosso and Rondônia, Brazil) the leaves are more oblong to lanceolate, and to the east (states of Minas Gerais and Bahia) they are elliptic to obovate. It was not possible to find limits or distinctive characters that separate *M. nambyquarae* and *M. herpetica*, and, for this reason, the first is considered here as a synonym of *M. herpetica*.

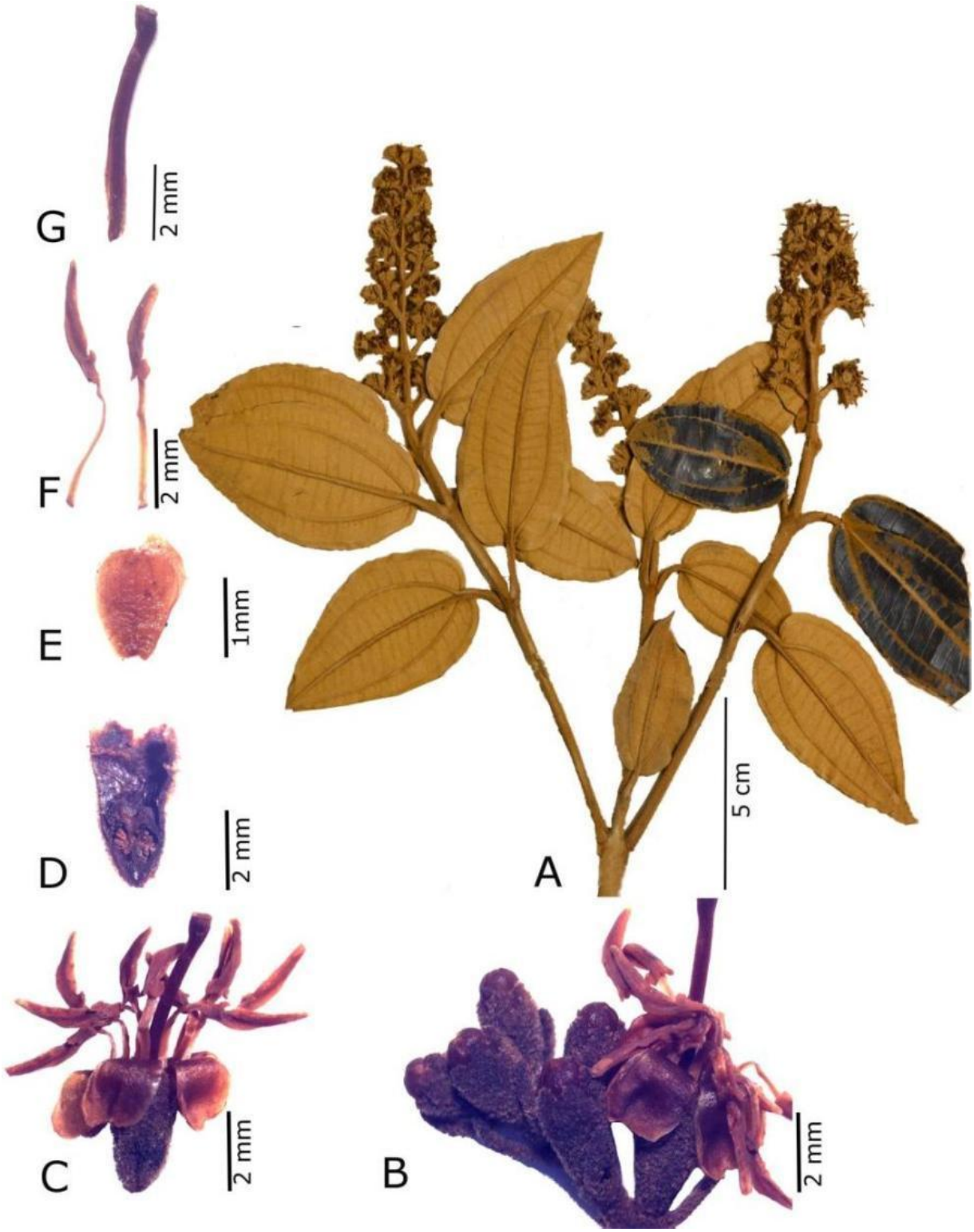

FIGURE 28. A-G: *Miconia herpetica***.** A. Fertile branch. B. Inflorescence branch. C. Flower. D. Hypanthium in longitudinal section with ovary. E. Petal. F. Stamens. G. Style.

7. *Miconia hypoleuca* (Benth.) Triana. Trans. Linn. Soc. London 28: 119 (1871). *Chaenopleura hypoleuca* Benth., J. Bot. 2: 315 (1840). *Acinodendron hypoleucum* (Benth.)

Kuntze, Revis. Gen. Pl. 2: 951 (1891). Type:—BRITISH GUIANA. Lectotype: *Schomburgk 392* (K!); isolectotypes: BM, E fide Goldenberg et al. (2013) GDC!, K!,P!, W!).

M*iconia cruegeriana* Naudin, Ann. Sci. Nat., Bot., Ser. 3 16: 245 (1850). *Chaenopleura ferruginea* Crueg., Linnaea 20: 112 (1847). Type:—TRINIDAD. Lectotype: *Crueger s.n.* (K!); isolectotypes: BR!, HAL-image!, K!, S-image!

Miconia blanchetiana Naudin, Ann. Sci. Nat., Bot., Ser. 3 16: 202 (1850). Type:— BRAZIL. Bahia. Lectotype: *Blanchet 1470* (P!); isolectotypes: BR!, G-DC!, K!

Trees up to 18 m high; branches, petioles and inflorescence densely covered by brownwish amorphous hairs. Branches rounded. Petioles 0.8–3.4 cm long. Blades 8.5–37 × 3.5–12.5 cm, lanceolate to obovate, apex attenuate, acuminate to sometimes cirrose, base attenuate, margin entire to slightly dentate in the superior half, adaxial surface glabrous, abaxial surface densely covered by amorphous trichomes, longitudinal nerves 5, with an additional faint, marginal pair, basal. Panicles 7.5–13.5 × 5.5–14.5 cm, terminal, branches subscorpioid or dichasial, 0.1–0.3 cm long; bracts and bracteoles persistent. Flowers 5-merous. Hypanthium 1–1.5 mm long, campanulate, externally covered by whitish amorphous trichomes inner surface and torus glabrous. Calyx inner lobes triangulars, persistent in fruit, inner surface glabrous, tube 0.2–0.3 mm long, outer lobes ca. 0.5 mm long, apex with a tooth. Petals 2–2.6 × 0.6–1.1 mm, margins glabrous. Stamens white, dimorphic, filaments in the antesepalous stamens 2.7–3.1 mm long, in the antepetalous 1.9–2.3 mm long, both glabrous; connectives prolonged below the thecae 0.8–1 mm long in the antesepalous and 0.6–0.7 mm long in the antepetalous, with a dorsal rounded projection in the antesepalous, and a dorsal spur in the antepetalous; anthers 1.7–2.3 mm long in the antesepalous and 1.4–1.5 mm long in the antepetalous, oblong, with two ventral longitudinal slits 1–1.2 mm long. Ovary 0.7–1.1 mm long, 1/2 adherent to the hypanthium, 3-locular, apex glabrous. Style 4.1–4.5 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, 2.1–3 mm diam., orange when ripe, 41–53 seed.

Additional specimens examined:—BRAZIL. s.l., s.d., *Sellow 121* (P). *Sellow 1030* (US). **Alagoas:** Murici, 15 Mar 2002, *Lyra-Lemos 6300* (NY), 29 Jun 2002, *Lyra-Lemos 6965* (NY), 30 Jun 2002, *Lyra-Lemos 7038* (NY), 31 Jul 08, *Lima 6980* (RB). São João da Lage, 26 Feb 2002, *Oliveira 787* (UPCB). **Amazonas:** "Distrito Agropecuário", 23 Nov 1988, *Mori 20013* (NY), 06 Jan 1990, *Freitas 533* (INPA, NY), 20 Jan 1993, *Oliveira A502* (INPA, NY),

27 Jan 1993, *Oliveira A698* (NY). "Estrada Manaus-Itacoatiara" 05 Nov 1969, *Rodrigues 8603* (INPA, US). Manaus 16 Nov 10, *Ducke 11150* (RB), 25 Jan 10, *Zartman 5140* (INPA). "Manaus-Caracaraí", 24 Sep 1982, *Renner 874* (US). "Reserva Biológica de Uatumã", 22 Nov 2005, *Melo 309* (INPA). **Bahia:** s.l., s.d., *s.c. s.n.* (K000828875) (K). Arataca, 13 Apr 2006, *Goldenberg 858* (RB, UPCB), 29 Apr 2006, *Amorim 5984* (UPCB). "Área de controle da Caraíba metais", 8 Dec 1982, *Noblick 2384* (US). Belmonte, 29 Nov 1987, *Santos 4342* (US). Camacã, 19 Jan 1971, *Santos 1344* (US), 9 Apr 2006, *Goldenberg 833* (RB, UPCB), 9 Apr 2006, *Goldenberg 849* (RB, UPCB). Canavieiras, 14 July 1964, *Silva 58380* (US). Eunápolis, 03 Jul 90, *Santos 875* (US). "Estrada Itabuna-Una", 24 Jan 1980, *Heringer 3274* (NY). "Estrada que dá acesso a Lagoa Encantada", 28 Jan 1980, *Heringer 3428-A* (K, MG). Ibirapitanga, 17 Feb 1998, *Conceição 195* (INPA). Ilhéus, 1821, *Riedel 7779* (BR, K, P, W), 19 Jan 1965, *Belém 188* (IAN, NY, RB), 10 May 1993, *Thomas 9840* (K, NY, US), 16 Mar 1996, *Thomas 11056* (NY), 25 Aug 1996, *Goldenberg 387* (INPA). Itabelo, 13 Aug 1995, *Hatschbach 63274* (INPA). Itabuna, 14 Jul 1964, *Silva 58380* (NY, US). Itagibá, 16 Oct 2008, *Guedes 16499* (US). Maraú, 6 Aug 1967, *Vinha 56* (US). 5 Feb 1979, *Mori 11361* (K, NY, RB), 14 Jul 1979, *Ribeiro 9* (RB), Porto Seguro, 3 Nov 1978, *Euponino 365* (NY, US), 14 Nov 1996, *Thomas 11220* (NY,RB), 17 Jul 1997, *Thomas 11578* (RB, US), 11 Jun 2003, *Hatschbach 75165* (W). Rodovia Camacan-Canavieira, 10 Apr 1965, *Belem 732* (IAN, RB, US). Ubaíra, Jan 1991, *Sobral 6704* (UPCB). Una, 26 Feb 1978, *Mori 9308* (NY, RB), 27 Aug 1980, *Rylands 21* (INPA, RB), 12 Fev 1994, *Pirani 2954* (K, NY, US),24 Jan 1996, *Amorim 1900* (NY), 12 Jun 2010, *Caddah 791* (RB, UPCB). Uruçuca, 9 Jan 1900, *Mattos-Silva 5172* (RB). **Ceará:** s.l., s.d., *Allemao s.n.* (K, P). Baturité, 9 Mar 2003, *Eugenio 933* (RB). Guaramiranga, 13 Aug 1976, *Fernandes s.n.* (UPCB), 19 Oct 1979, *Castro s.n.* (UPCB). **Espírito Santo:** Ibiraçú, 27 May 1990, *Fernandes 2944* (US). Linhares, Jul 1985, *Sobral 4040* (INPA), Mar 1986, *Sobral 4747* (INPA, NY, US), 21 Aug 1996, *Goldenberg 380* (UPCB), 17 Jul 2012, *Saddi 775* (RB). Santa Leopoldina, 18 May 2006, *Magnago 1042* (RB), 13 Sep 2006, *Demuner 2853* (RB), 24 Oct 2007, *Demuner 4352* (RB). São Mateus, 15 May 1977, *Martinelli 2222* (RB). Sooretama, 20 Jan 2010, *Oliveira 746* (RB). **Pará:** "Belém-Mosqueiro", 13 Jul 1977, *Rosa 1202* (INPA, MG, NY). Bragança, 26 Oct 1907, *Siqueira 8806* (MG, P, RB, US). Castanhal, 10 Dec 1949, *Black 49-8587* (IAN, NY), 16 Jan 2003, *Salomão 955* (MG). "Porto Trombetas", 1 Jan 1996, *Barbosa 6* (INPA), 18 Jun 1999, *Miranda 410* (INPA). Santa Izabel, 30 Sep 1905, *"Pessoal do Museu" 9689* (MG). Santarém, 30 Aug 1988, *Rosário 1073* (MG). **Pernambuco:** Bonito, 17 Apr 2001, *Silva 371* (UPCB).

Gravatá, 5 Jul-2010, *Silva 247* (RB), Igarassu, 12 Jul 2001, *Silva 23* (NY), 5 Dec 2001, *Freire 23* (NY), 24 Jan 2004, *Sá e Silva 279* (NY), 11Jun 2007, *Silva 339* (RB, UPCB). Jaqueira, 19 Feb 2000, *Siqueira-Filho 1058* (UPCB), 17 Aug 2010, *Chagas 8* (NY), 12 Oct 2010, *Gomes-Costa 187* (NY). Lagoa dos Gatos, 6 Oct 2011, *Leão 901* (RB). Paulista 4 Jun 2000, *Araújo 94* (UPCB). São Vicente Férrer, 31 Jul 1998, *Ferraz 360* (UPCB). **Rio de Janeiro:** Casimiro de Abreu, 24 Feb 2005, *Pessoa 1085* (NY), 24 Feb 2005, *Pessoa 1089* (RB), 27 Sep 2010, *Braga 284A* (RB). Macaé, 16 Aug 2001, *Baumgratz 827* (RB). Rio das Ostras, 16 May 2000, *Oliveira 140* (UPCB). Santa Maria Madalena, 31 May 1997, *Pineschi 205* (UPCB). Silva Jardim, 1994, *Luchiari 552* (RB), Nov 1995, *Goldenberg 108* (RB), 5 Apr 2001, *Silva-Neto 1431* (K, RB), 14 Feb 03, *Abbas 84* (RB), 23 Aug 2006, *Marcon 3* (RB). **Roraima:** "Serra do Surucucu", 19 Feb 1969, *Prance 10074* (INPA, K, MG, NY, US), 20 Feb 1969, *Prance 10123* (INPA, K, MG, NY, P). **FRENCH GUIANA. Cayenne:** "Piste de Saint Elie", 6 Oct 1991, *Sabatier 3902* (US). "SW de Sinnamary", 1 Mar 1980, *Lescure 943* (P, US). **GUYANA.** s.l., 16 Oct 1929, *Sandwith 463* (RB). Barima-Waini: Matthews Ridge, 28 Apr 1991, *McDowell 4487* (NY, US). Sebai Village, 16 Dec 1991, *Hoffman 625* (NY). Port Kaituma, 9 Dec 1991, *Hoffman 530* (NY, US). Mabura Region: Mabura Hill, 11 Oct 1989, *Jansen-Jacobs 1965* (K, US). West Pibiri compartment, 12 Oct 1993, *Ek 956* (NY).: Kurupukari main, 27 Nov 1993, *Ek 1019* (NY). Potaro-Siparuni: "Elizabeth Creek", 15 Oct 1990, *McDowell 3552* (NY): "Iwokrama Rainforest Reserve", 20 Sep 1995 , *Clarke 185* (NY, US): Maikwak, 5 Apr 1988, *Hahn 4252* (NY, P, US). **Upper Mazaruni:** "Mt. Ayanganna", 1 Aug 1960, *Tillet 44967* (P, US). 1 Aug 1960, *Tillet 45879* (US). **Upper Takutu-Upper Essequibo:** "Kamoa Mts.", 11 Nov 1996, *Clarke 3099* (NY, US). **Cuyuni-Mazaruni :** Imbaimadai, 30 Nov 2002, *Redden 1324* (NY). "Isseneru Creek", 2 Nov 2006, *Redden 4918* (US). Kurupung, 14 Nov 1922, *Lang 171* (US). Pakaraima Mountains, 8 Nov 1992, *Hoffman 3284* (INPA, NY)."Paruima to Konuktipu trail", 11 Feb 1996, *Clarke 1086* (INPA, US). Upper Demerara-Berbice: Berbice, 22 Apr 1993, *Hoffman 4010* (US). "Mabura Hill Forest Reserve", 21 Oct 2002, *Redden 1064* (INPA, NY, US). "Mabura Hill", 30 Dec 1995, *Clarke 712* (US). SURINAME. s.l., 16 Sep 1915, *Boschwezen 630* (IAN, RB, US). **TRINIDAD AND TOBAGO. Tobago:** "Mt. St. George", 18 Sep 1927, *Williamns 11808* (NY). **Trinidad:** s.l., s.d., *s.c. 925* (US01100167) (US). s.l., s.d., *s.c. 926* (US01100163) (US). s.l., s.d., *s.c. 1704* (US01100165) (US). s.l., s.d., *s.c. 2850* (US01100164) (US). Arima, 18 Mar 21, *Briton 2401* (US). "Blanchissense Road", 22 Jul 1927, *Broadway 6648* (US). "Heights of Aripo", 10 Jan 22, *Broadway 9799* (NY). **VENEZUELA. Bolívar:** San Martín de Turumban, Feb 1980, *Delascio 8757* (US). "Sierra

Imataca", 11 Dec 1960, *Steyermark 87954* (NY, US). "Serrania Maigualida", 16 Apr 1989, *Stergios 13790* (NY, US). **Sucre:** "Peninsula de Paria", 6 Aug 1966, *Steyermark 96079* (NY, US). "Límite distritos Arismendi/Benitez",9 Jan 2005, *Meier 11199* (NY). Valdez, 16 Dec 1965, *Terán 2893* (INPA, US).

FIGURE 29. Distribution of *Miconia hypoleuca*.

Illustration:—Wurdack (1973): 467 (Fig. 45). Figure 30.

Habitat, distribution and ecology:—*Miconia hypoleuca* occurs in lowland forest from Trinidad and Tobago to the Amazon and Atlantic Forest of Brazil.

Discussion:—*Miconia hypoleuca* differs from the other species with paniculate inflorescences by its acute blade base, diminute flowers, anthers that dehisce by two longitudinal slits (ventrally expanded pores according to Goldenberg *et al.* 2003) and small fruit with a caducous calyx.

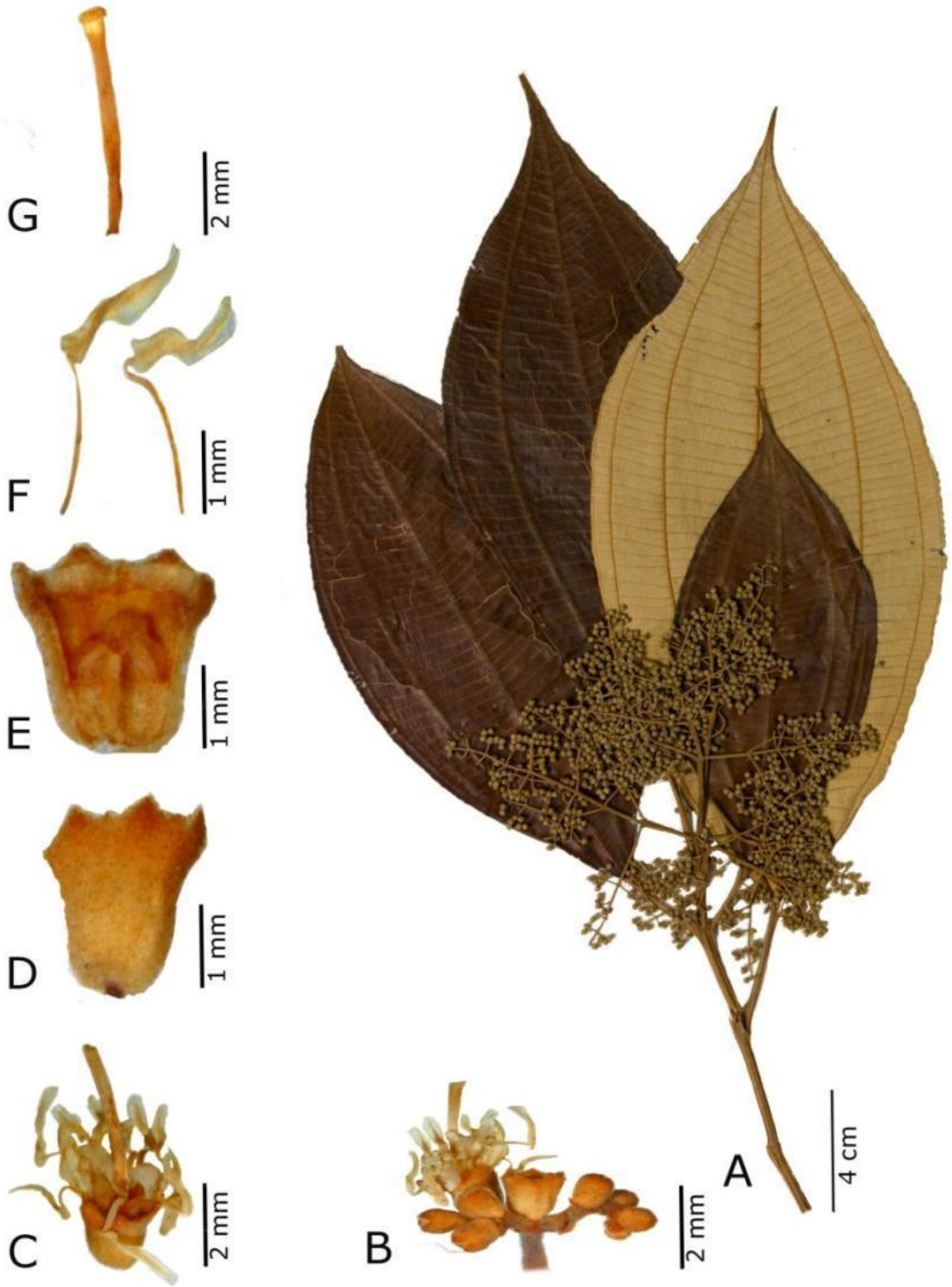

FIGURE 30. A-G: *Miconia hypoleuca*. A. Fertile branch. B. Inflorescence branches. C. Flower. D. Hypanthium, external surface. E. Hypanthium in longitudinal section. F. Stamens. G. Style.

8. *Miconia longispicata* Triana, Trans. Linn. Soc. London 28:117 (1871). *Acinodendron longispicatum* (Triana) Kuntze, Revis. Gen. Pl. 2: 951 (1891). Type:—BRAZIL. Amazonas.

Lectotype designated here: *Spruce 2280* (K!); Isolectotypes: BM-image!, CAS-image!, GDC!, M!, NY!, TCD-image!

Miconia longipedunculata Cogn. in Martius, Fl. bras.14 (4): 266 (1887). Acinodendron longipedunculatum (Cogn.) Kuntze, Revis. Gen. Pl. 2:951 (1891). Type:—BRAZIL. Amazonas. Lectotype designated here: *Spruce s.n.* (BM-image!); isolectotypes: BR!, C-image!, GDC!, M!, NY!

Miconia longispicata var. *minor* Cogn. in Martius, Fl. bras.14 (4): 267 (1887). Type:—BRAZIL. Pará. Lectotype designated here: *Poepig 2904* (BR!); isolectoype: NY!.

Treelets to trees up to 10 m high; branches, petioles and inflorescence densely covered by brownwish stelate hairs. Branches rounded. Petioles 1–4.5 cm long. blades 11.5–28 × 4.5–16 cm, ovate, apex acuminate to attenuate, base cordulate, margin entire to slightly dentate in the superior half, adaxial surface glabrous, abaxial surface densely covered by whitish stellate tricomes longitudinal nerves 5, with an additional faint, marginal pair, basal. Inflorescence spiciform 16–25 × 1–1.3 cm, terminal, branches glomerulate; bracts and bracteoles deciduous. Flowers 5-merous. Hypanthium 1.4–2 mm long, urceolate, externally covered by whitish stellate trichomes inner surface and torus glabrous. Calyx inner lobes truncate, persistent in fruit, inner surface glabrous, tube 0.4–0.8 mm long, outer lobes 0.5–0.8 mm long, apex with a tooth. Petals 1.9– 2.2 × 0.6–1 mm, margins glabrous. Stamens white, slightly dimorphic in size, filaments in the antesepalous stamens 3.2–3.4 mm long, in the antepetalous 2–2.7 mm long, both glabrous; connectives prolonged below the thecae ca. 0.2 mm long in the antesepalous and ca. 0.3 mm long in the antepetalous, both ventrally slightly bilobated; anthers 2.3–2.6 mm long in the antesepalous and 2.2–2.4 mm long in the antepetalous, oblong, with a single terminal, dorsally inclined pore, 0.07–0.08 mm diam. Ovary 0.9–1.3 mm long, 1/2 adherent to the hypanthium, 3-locular, apex glabrous. Style 3.9–5.6 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, 3–4.5 mm diam., red when ripe, 13–16 seeds.

Additional specimens examined:—BOLIVIA. Beni: Mamoré, Feb 1993, *Bergeron 863* (US). "NW of Guayaramerin", 24 Jan 1978, *Anderson 11841* (US), 2 Feb 1978, *Anderson 11958* (NY). **Santa Cruz:** Velasco, 11 Apr 1994, *Guillén 1259* (G, US), 23 Jan 1997, *Guillén 284* (NY). **BRAZIL.** s.l., Mar 1851, *Spruce s.n.* (G-DC, W), Mar 1851, *Spruce 1402* (K). **Amazonas:** "Auaretê", 13 Jun 1975, *Pena 742* (IAN). Borba, 6 May 1985, *Henderson 325*

(INPA, NY). "Estrada Manaus-Caracaraí", 1 Jan 1978, *Anderson s.n.* (INPA142454), 1 Jan 1978, *Anderson s.n.* (INPA142472). "Estrada Manaus-Itacoatiara", 14 May 1972, *Loureiro s.n.* (INPA35782), 26 Apr 1974, *Rosa 177* (IAN), 11 Jul 1974, *Rodrigues 9506* (INPA), 29 Mar 1976, *Ramos 373* (INPA, NY, US). "Estrada Manaus-Porto Velho", 8 Jul 1972, *Silva 247* (INPA), 19 Mar 1974, *Prance 20731* (INPA, MG, NY, P, US), 17 Jun 1975, *Rodrigues 9604* (INPA). Fonte Boa, 3 Jun 1976, *Ramos 434* (INPA, MG). "Lago do Castanho-Mirim", 25 Jun 1973, *Alburquerque 874* (INPA). Manaus, 22 Apr 1943, *Ducke 164* (IAN, K, NY, US,), 23 Apr 1956, *Mello s.n.* (INPA3769), 4 Apr 1961, *Rodrigues 2318* (INPA, US), 4 Apr 1961, *Rodrigues 2319* (US), 11 Jun 1964, *Rodrigues 5904* (INPA, US), 23 Apr 1970, *Rodrigues 8863* (INPA), 25 Apr 1973, *Loureiro s.n.* (INPA37679), 22 Apr 1974, *Prance 20975* (INPA, NY, US), 15 Jul 1976, *Souza 72782* (INPA), 2 Dec 1976, *Nascimento s.n.*, (INPA66282), 6 Apr 1977, *Alburquerque 67-14* (INPA), 6 Apr 1977, *Byron 67-14* (US), 25 May 1980, *Davidson 10003* (INPA, MG, NY, RB), 8 Apr 1982, *Renner 757* (INPA), 16 Jul 1992, *Nee 43004* (INPA, NY), 22 Mar 1995, *Sothers 353* (G, INPA, K, MG, NY, RB), 22 Mar 1995, *Sothers 356* (INPA, MG), 26 Apr 1995, *Sothers 418* (INPA, MG), 27 May 1995, *Ribeiro 1635* (G, INPA, MG, NY, RB), 3 Apr 1996, *Sothers 849* (INPA, MG), 4 Jun 1996, *Costa 552* (MG, US), 3 Jun 1998, *Skatulla 191* (INPA), 7 Apr 2000, *Cruz 586* (INPA), 15 Apr 2000, *Kinupp 1320* (INPA), 19 Apr 2004, *Carvalho 159* (INPA), 22 Jun 2011, *Meirelles 641* (INPA), 5 Dec 2012, *Corrêa 106* (INPA), 1 Feb 2013, *Corrêa 143* (INPA), 2 Mar 2013, *Corrêa 197* (INPA). Maués, 13 Jul 1983, *Zarucchi 2993* (INPA, MG, NY, RB, US), 21 Jul 1983, *Hill 13133* (INPA, MG, NY, RB, US). "Rio Xié", 9 May 1973, *Silva 1441* (INPA). São Gabriel da Cachoeira, Jan-Aug 1852, *Spruce 2280* (G, G-DC, K, NY, W), 19 Feb 1975, *Cordeiro 227* (IAN), 19 Feb 1975, *Ribeiro 721* (IAN, MG, RB, US) , 20 Oct 1978, *Madison 514* (INPA), 20 Oct 1978, *Nascimento 697* (MG, NY, RB). São Paulo de Olivença, Apr 1945, *Fróes 20753* (IAN, NY, US). Tefé, 30 Mar 1984, *Santos 775* (INPA, NY, US). **Mato Grosso:** Gaúcha do Norte, 23 Mar 1999, *Ivanauskas 4034* (UEC, UPCB), 25 Mar 1997, *Dario 1020* (RB, UPCB). Novo Mundo, 28 Jan 2008, *Zappi 913* (K, NY), 7 Feb 2008, *Sasaki 2227* (K, NY), 9 Feb 2008, *Zappi 1150* (K, NY). **Pará:** s.l., 14 Jun 1918, *Ducke 17079* (MG). "Coleiras", 1882, *Poeppig 2904* (NY, W). Óbidos, 30 Oct 1911, *Ducke 11829* (MG). Oriximiná, 10 Jul 1980, *Ferreira 1429* (INPA, MG, NY), 10 Sep 1980, *Ferreira 2384* (INPA, MG, NY, US)."Poção", 25 Jun 1954, *Fróes 30948* (IAN). "Porto Trombetas", 24 Apr 1986, *Soares 114* (INPA). "Rio Trombetas", 21 May 1974, *Prance 22232* (INPA, NY, W), 3 June 1974, *Campbell P22482* (INPA, K, MG, NY, P, US), 31 May 1978, *Silva 4676* (MG, NY,

RB), 7 Jul 1980, *Martilnelli 7294* (INPA, NY). **Rondônia:** Costa Marques, 28 Mar 1987, *Nee 34526* (INPA, MG, NY, US). Guajará Mirim, 31 Jan 1983, *Carreira 392* (IAN, INPA, MG), 4 Nov 1987, *Nee 34768* (INPA, MG, NY, US). Pimenteiras, 20 Jan 1997, *Lobato 1540* (MG). Porto Velho, 6 Feb 1983, *Freitas 21* (INPA), 11 Feb 1989, *Maciel 1752* (MG), 30 Oct 2010, *Silveira 311* (RB), 25 Mar 2012, *Boelter 435* (UEC). "Serra dos Pacaás Novos", 17 Mar 1978, *Anderson 12153* (NY, US). **Roraima:** Alto Alegre, 20 Feb 1969, *Prance 10127* (INPA, K, MG, NY, P, US). Amajarí, 12 Feb 1969, *Prance 9859* (INPA, K, MG, NY, US). "Serra dos Surucucus", 28 Oct 1991, *Almeida 761* (MG). **COLOMBIA. Amazonas:** "Rio Igaraparaná", 4 Jun 1942, *Schultes 3947* (US). **Caquetá:** "Cordillera Oriental", 27 Apr 1944, *Little 7743* (US), Florencia, 30 Mar 1940, *Cuatrecasas 8904* (US). **Vaupés:** s.l., 5 Jun 1952, *Schultes 16622* (US). Mitú, 20 May 1976, *Zarucchi 1608* (US). "Rio Apaporis", 12 Jun 1951, *Schultes 12430* (US). "South of Mitú", 3 Sep 1959, *Maguire 44076* (NY, US). **FRENCH GUIANA.** Camopi, 30 Aug 1973, *Oldeman T917* (P). Régina, 15 Jun 1988, *Feuillet 10221* (NY). "Tumuc Humac", 20 Aug 1972, *Granville 4482* (P, US). **GUYANA. Upper Takutu-Upper Essequibo:** "Acarai Mts.", 29 Aug 1998, *Clarke 7196* (NY, US). **VENEZUELA. Amazonas:** Atabapo, Oct 1989, *Delgado 780* (US), May 1990, *Marin 1242* (US). Atures, Oct 1989, *Sanoja 3288* (US). "Carretera San Carlos-Solano", 25 Apr 1974, *Morillo 3973* (US). "Rio Metacuni", 20 Jan 1990, *Stergios 13966* (NY, US). "Rio Negro", 4 Jul 1984, *Davidse 26977* (US), 12 Apr 1985, *Aymard 3525* (NY)."Rio Siapa", 19 Jul 1959, *Wurdack 43494* (G, IAN, RB, US). San Carlos de Rio Negro, 14 Jul 1978, *Clarke 6710* (US), 8 Jun 1997, *Michelangeli 448* (NY).

FIGURE 31. Distribution of *Miconia longispicata*.

Illustration:—Berry *et al* (2001): Figura 32-33.

Habitat, distribution and ecology:— *Miconia longispicata* occurs in the understory of Amazonian forest. Its mature fruits are red and might be dispersed by birds.

Discussion:—*Miconia longispicata* is easily recognized among the species of the albicans clade by its inflorescences that are spiciform with glomerulate flowers and by its indument of stellate trichomes. In the past, this species was included in section *Miconia* subsect. *Aplostachyae* based on the form of its inflorescence.

FIGURE 32. A-B. *Miconia longispicata*. A. Inflorescence. B. Fruits.

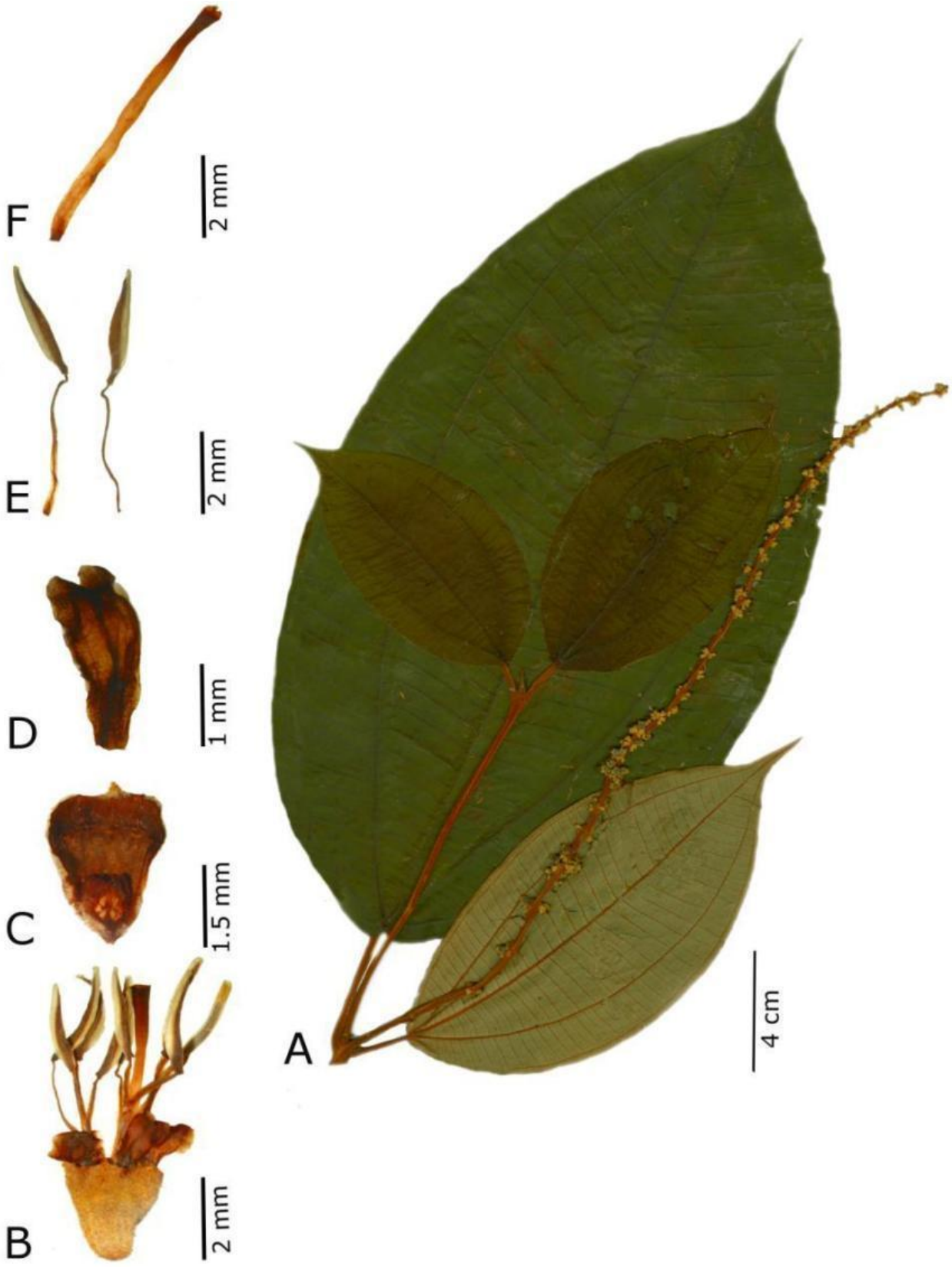

FIGURE 33. A-F: *Miconia longispicata*. A. Fertile branch. B. Flower. C. Hypanthium in longitudinal section with ovary. D. Petal. E. Stamens. F. Style.

9. *Miconia lourteigiana* Wurdack, Phytologia 20: 380 (1970). Type:—PERU. Amazonas. Holotype: *Wurdack 1919* (US!); isotypes: F-image!, NY!

Trees up to 13 m high; branches, petioles and inflorescence densely covered by whitish amorphous hairs. Branches rounded. Petioles 0.8–1.7 cm long. Blades 7.6–16.7 × 3.2–7.4 cm, lanceotate to obovate, apex atenuate, base acute, margin entire, adaxial surface glabrous, abaxial surface densely covered by amorphous trichomes, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 8.6–14.7 × 3.8–8.2 cm, terminal, branches bifid subscorpioid, 1.7–2.6 cm long; bracts and bracteoles deciduous. Flowers 4-5-merous. Hypanthium 1.7–1.8 mm long, campanulate, externally covered by whitish amorphous trichomes inner surface and torus glabrous. Calyx inner lobes broad triangulars, persistent in fruit, inner surface glabrous, tube 0.5–0.6 mm long, outer lobes 0.8–1.1 mm long, apex without a tooth. Petals 2.6– 2.8 × 1.1–1.2 mm, margins glabrous. Stamens white, dimorphic, filaments in the antesepalous stamens 3.4–3.8 mm long, in the antepetalous 3.1–3.4 mm long, both glabrous; connectives prolonged below the thecae ca. 1 mm long in the antesepalous and 0.6–0.8 mm long in the antepetalous, with a cordate ventrally bilobed in the antesepalous, and a skirt-like ventrally bilobed and a dorsal spur in the antepetalous; anthers ca. 3 mm long in the antesepalous and 1.5–2.4 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined pore, 0.2–0.3 mm diam. Ovary 1.4–2 mm long, 1/2 adherent to the hypanthium, 3-locular, apex glabrous. Style 5.6–6 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, 3–4.8 mm diam., blue when ripe, 10–40 seeds.

Additional specimens examined:—"Flor. Amazon. Ega", s.d., *Poeppig 2542* (P). **BOLÍVIA.** "Coroico", 1851, *Weddell s.n.* (P-P05202242, P05202248, P05202249). **Beni:** Mamoré, 29 May 1992, *Bergeron 28* (US). **La Paz:** Abel Iturralde, 13 Aug 2005, *Zenteno 2680* (M), Franz Tamayo, 10 Apr 2002, *Miranda 98* (M). Sud Yungas, 1 Jul 1939, *Krukoff 10106* (NY, US), 27 Oct 1993, *Seidel 7409* (M), 29 Jul 2001, *Orellana 1273* (NY). **Mapiri:** s.l., 17 Sep 1901, *Williams 760* (NY, US). **Pando:** Madre de Dios, 17 Aug 1985, *Nee 31371* (NY), 10 Jul 1968, *Prance 5784* (INPA, NY, US). Manupiri, 13 Aug 1994, *Jardim 1015* (NY). **Santa Cruz:** Velasco, 17 Oct 1994, *Killen 6934* (US). **BRAZIL. Acre:** Cruzeiro do Sul, 22 Oct 1966, *Prance 2745* (K, NY, US), 10 Nov 2001, *Croat 85004* (RB), 16 Nov 2007, *Goldenberg 1002* (NY, UPCB, RB). Mâncio Lima, 07 Jun 1994, *Silveira 802* (NY). Rio Branco, 16 Feb 2009, *Goldenberg 1408* (NY, RB). Sena Madureira, 26 Sep 1958, *Prance 7569* (K, MG, NY, US). Xapurí, 8 Nov 1991, Daly 7204 (INPA), 20 Sep 1998, *Ehringhaus*

626 (NY, US), 3 Jun 1999, *Ehringhaus 1033* (NY, US). **Amazonas:** Boca do Acre, 20 Sep 1966, *Prance 2461* (NY, US), 18 Oct 1975, *Monteiro s.n*. (INPA). Manaus, 8 Sep 2005, *Melo 26* (INPA). Pauini, 23 Jul 2008, *Quinet 1324* (NY, RB). **Maranhão:** São Luiz, 5 Feb 1992, Muniz 27 (INPA). **Pará:** Porto Trombetas, 10 Oct 1987, *Soares 293* (INPA). Juruti, 7 Nov 2007, *Ramos 434* (INPA). "Estrada entre Estreiro e Marabá", 10 Feb 1976, *Ribeiro 1302* (US). **COLOMBIA. Caquetá:** Florencia, 22 Jan 1969, *Cuatrecasas 27227* (NY, P, US), 23 Jan 1969, *Plowman 2262* (US). **ECUADOR. Paztaza:** "Between Napo and Puyo", 10 Dec 1970, *Ellenberg 3268* (US). Napo, 2 Sep 1988, *Palacios 2880* (US). **PERU. Amazonas:** Bagua, 10 Sep 1972, *Wurdack 1919* (NY). **Cuzco:** Paucartambo, 19 Aug 1954, *Vargas 11023* (US). **La Mar:** Ayacucho, 16 Aug 1968, *Dudley 11751* (US). **Loreto:** Iquitos, Aug 1925, *Tessmann 5391* (NY), Oct 1929, *Williams 3631* (NY), 24 Oct 1940, *Asplund 14031* (US), 24 Oct 1940, *Woytkowski 35328* (US). San Martín: Tocache, Jul 1830, *Poeppig 1863* (NY, W). Maynas, 1831, *Poeppig 2407* (G-DC, P, W), 9 Nov 1978, *Rimachi 4066* (NY, US), 26 Oct 1983, *Rimachi 7137* (BR). Mishuyacu, Jul 1929, *Williams 1454* (NY), Jul 1929, *Williams 1508* (NY), 24 Sep 1929, *Killip 29995* (NY, US), 26 Sep 1929, *Killip 29857* (NY, US), Oct–Nov 1929, *Klug 36* (NY, US), Oct–Nov 1929, *Klug 465* (NY, US), Oct–Nov 1929, *Williams 3836* (NY, US), Oct–Nov 1929, *Williams 4718* (NY, US). “Near the mouh o Rio Napo”, 14 Sep 1972, *Croat 20123* (NY, P).Quebrada de Nauta , 3 Jul 1972, *Croat 17531* (NY, US), 1831, *Poeppig 182* (W). “Rio Nanay”, 30 May 1972, *Mc Daniel 16088* (P). Yurimaguas, 22 Aug 1929 , *Killip 27544* (NY, P, US), 22 Aug 1929, *Killip 27948* (NY, RB, US), 22 Aug 1929, *Killip 28077* (NY, US). **Madre de Dios:** Manu, 6 Nov 1986, *Foster 12170* (NY, US), 5 Oct 1987, *Kahn 2244* (NY). **VENEZUELA. Apure:** San Camilo, 28 Mar 1968, *Steyermark 101449* (P, US). **Bolívar:** 2 Jan 1962, *Steyermark 90570* (NY, US).

FIGURE 34. Distribution of *Miconia lourteigiana*.

Illustration:—Figures 35 e 36.

Habitat, distribution and ecology:—*Miconia lourteigiana* occurs in the Amazon from lowland forest to the east side of Andes.

Discussion:—*Miconia lourteigiana* resembles *M. navioensis* due to the pattern of the veins and inflorescences with long secund branches. It differs by have an acute leaf base (Fig. 35) (*vs.* round to acute in *M. navioensis*), anthers dehiscent by an apical pore (*vs.* a ventrally expanded pore, similar to a slit, in *M. navioensis*) and connective appendages with two remarkable ventral projections (*vs.* no projections and a small, dorsal spur in *M. navioensis*). It also resembles *M. albicans* by the whitish indument and the inflorescence with secund branches; however, it differs by having an acute leaf base (*vs.* cordulate in *M. albicans*).

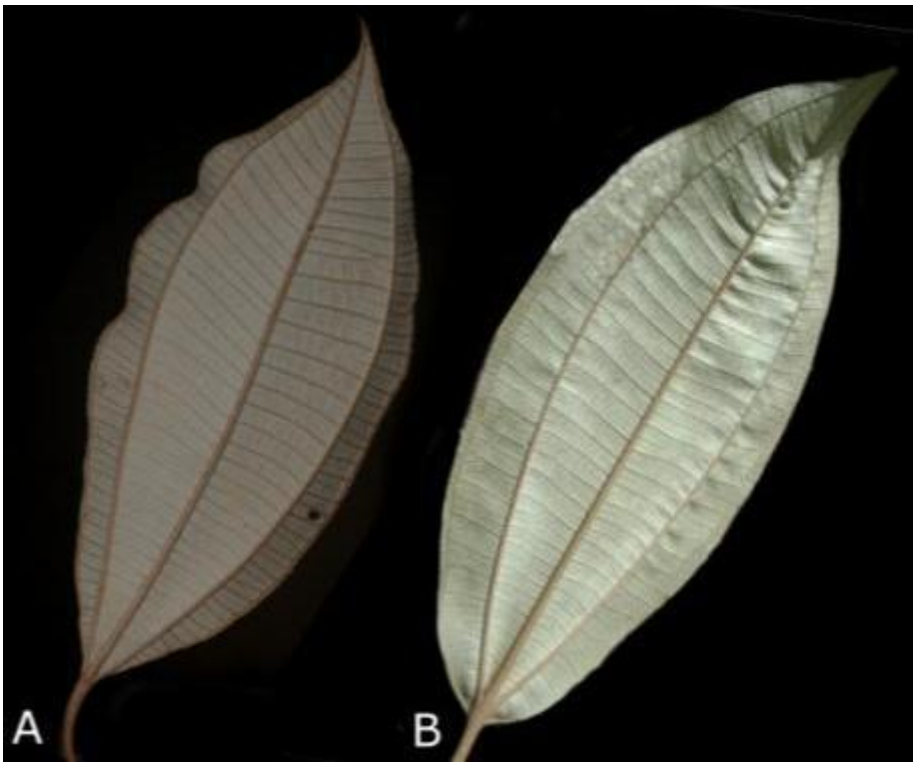

FIGURE 35. Leaves of *Miconia lourteigiana* and *M. navioensis*. A. *M. lourteigiana*. B. *M. navioensis*. (Picture: A. F.Michelangeli).

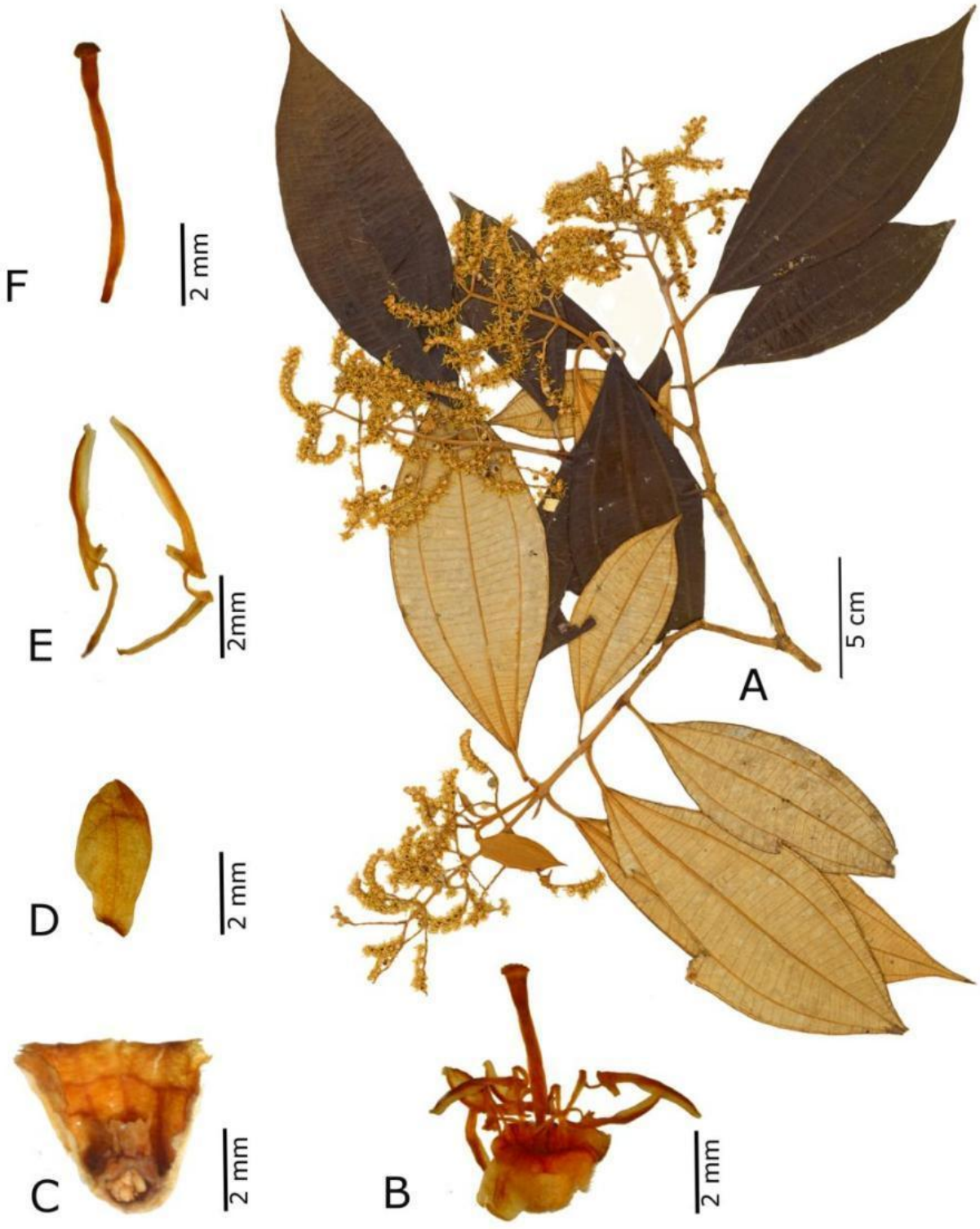

FIGURE 36. A-F. *Miconia lourteigiana.* A. Fertile branch. B. Flower. C. Hypanthium in longitudinal section with ovary. D. Petal. E. Stamens. F. Style.

10. ***Miconia macuxi*** **Meirelles, Caddah & R. Goldenb.,** Phytotaxa 220 (1): 54-60. Type:—BRAZIL. Roraima. Holotype: *Caddah & Meirelles 900* (INPA!); isotypes: IAN!, MG!, NY!, RB, UEC!, UPCB!, US!

Shrub to treelets up to 3 m high;. branches, petioles and inflorescence densely covered by brownwish stellate to shortly dendritic trichomes. Branches rounded. Petioles 1–2.3 cm long. Blades 8–14 × 3–5 cm, elliptic-lanceolate, apex acute to shortly acuminate, base rounded to cordate, margin entire, sometimes slightly revolute, adaxial surface glabrous, adaxial surface glabrous, abaxial surface denselly covered by amorphous trichomes,longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 3.5–5.5 × 2–4 cm, terminal, branches bifid subscorpioid, 0.5–1 cm long; bracts and bracteoles persistent. Flowers 5 (6)-merous. Hypanthium 2.1–2.4 mm long, campanulate, externally covered by brownwish stellate trichomes inner surface glabrous, torus with sparse glandular trichomes. Calyx inner lobes triangular, persistent in fruit, inner surface glabrous, tube ca. 0.5 mm long, outer lobes ca. 1 mm long, apex with a tooth. Petals 2.8–4.1× 2.1–2.3 mm, margins glandular-ciliate. Stamens white, dimorphic, filaments in the antesepalous stamens 3.1–3.7 mm long, in the antepetalous 2.3–2.7 mm long, both glabrous; connectives not prolonged below the thecae in both cycles, with skirt-like appendages in the antesepalous, and two ventral lobules and a dorsal tooth in the antepetalous; anthers 1.7–2.3 mm long in the antesepalous and 1.8–2.1 mm long in the antepetalous, oblong, with a single terminal pore ventrally displaced in the antesepalous and terminal to dorsal displaced pore in the smaller stamens ones, ca. 0.15 mm diam. Ovary ca. 1.5 mm long, 1/2 adherent to the hypanthium, 3-locular, apex sparsely covered with stellate trichomes. Style 5.7–6.7 mm long, slightly curved, with sparse glandular-stipitate trichomes in the basal half, stigma punctiform. Fruits baccate, 3.4–3.6 mm diam., black when ripe, 10–15 seeds.

Additional specimens examined:—BRASIL. Amazonas: "Nova Prainha", 24 Jul 1976, *Mota s.n.* (INPA). **Roraima:** Caracaraí, 25 Jan 2011, *Cangani 132* (INPA), 30 Jul 2011, *Zartman et al. 8506* (INPA, UPCB); 19 Oct 2011, *Meirelles et al. 761* (INPA, UPCB); 21 Oct 2011, *Goldenberg et al. 1594* (UPCB). **VENEZUELA. Amazonas:** La Esmeralda, 2 Nov 1928, *Tate 322* (NY, P, US), 14 Nov 1950 , *Maguire 29432* (NY). **Atabapo:** "Cerro Huachamacari", 5 Mar 1980, *Huber 4998* (NY, US). 24 Feb 1985, *Liesner 17918* (US).

FIGURA 37. Distribuição de *Miconia macuxi*

Illustration:—Figuras (38-39).

Habitat, distribution and ecology:—*Miconia macuxi* is known from the Brazilian Amazon, where it was collected in vegetation on white-sand soil (campinas). Some of these places are periodically flooded in the states of Roraima and Amazonas. This species also occurs close to rivers in savanna in southern Venezuela.

Discussion:—*Miconia macuxi* belongs to a clade of species with thyrses that have subsecund and subscorpioid branches and glandular-ciliate petals margins. These species are the following: *M. argyrophylla*, *M. astrocalyx*, *M. fallax, M. mayarae*, *M. stenostachya* and *M. weddellii*. However, only *M. astrocalyx* and *M. weddellii* have a stellate indument like *M. macuxi*. The distinctive features that separate *M. macuxi* and *M. astrocalyx* are indument color (yellowish in *M. astrocalyx vs.* tawny in *M. macuxi*), larger calyx lobes in *M. astrocalyx* and indument on the inner surface of the calyx lobes (present in *M. astrocalyx vs.* absent in *M. macuxi*). Furthermore, *M. macuxi* is endemic to the Amazon while *M. astrocalyx* is endemic to cerrado and rocky fields in the Chapada Diamantina region (Bahia State, Brazil). *Miconia macuxi* has stamens with discrete, ventrally bilobed appendages verses skirt-like appendages with a conspicuous, dorsal, rounded projection in *M. weddelli.* The distribution and habitat of

these two species are very different. *Miconia weddelli* is endemic to rocky cerrado in Mato Grosso State, on the border of Goiás State, in Brazil.

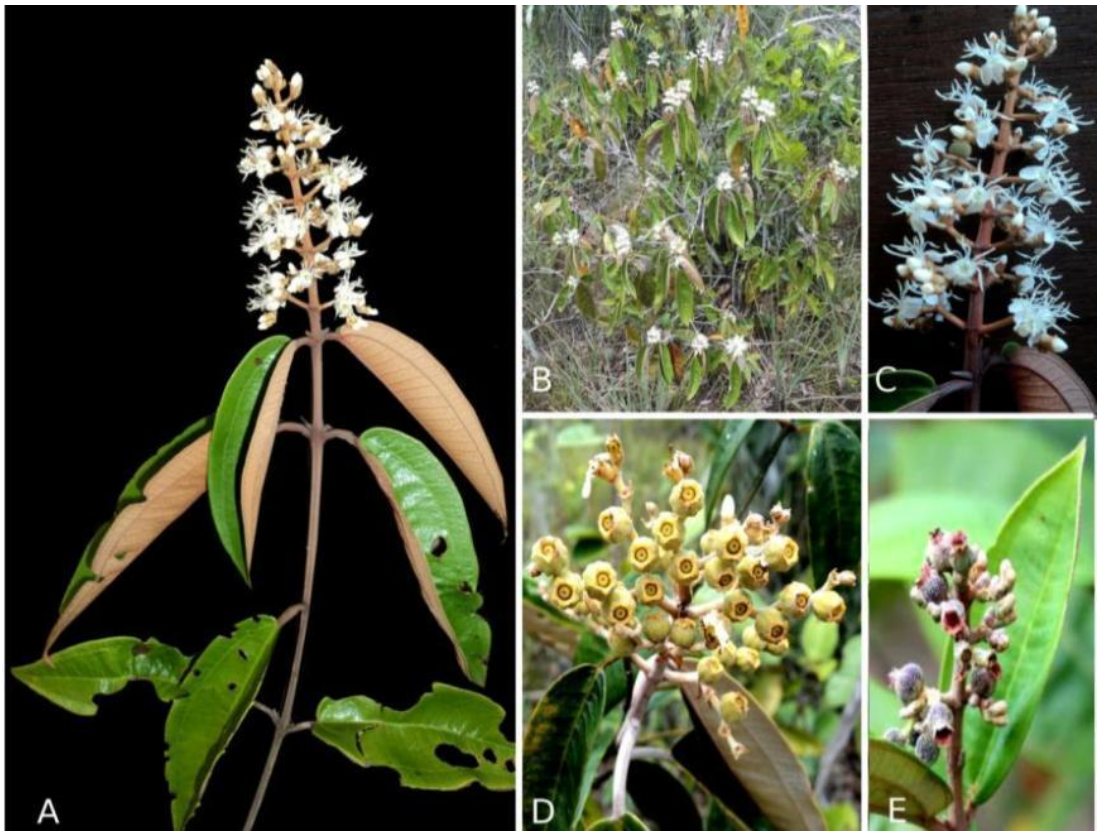

FIGURA 38. A-E. *Miconia macuxi.* A. Fertile branch. B**.** Habit. C. Inflorescence. D. Immature fruits. E. Ripe fruits (Picture E: P. Alfaia).

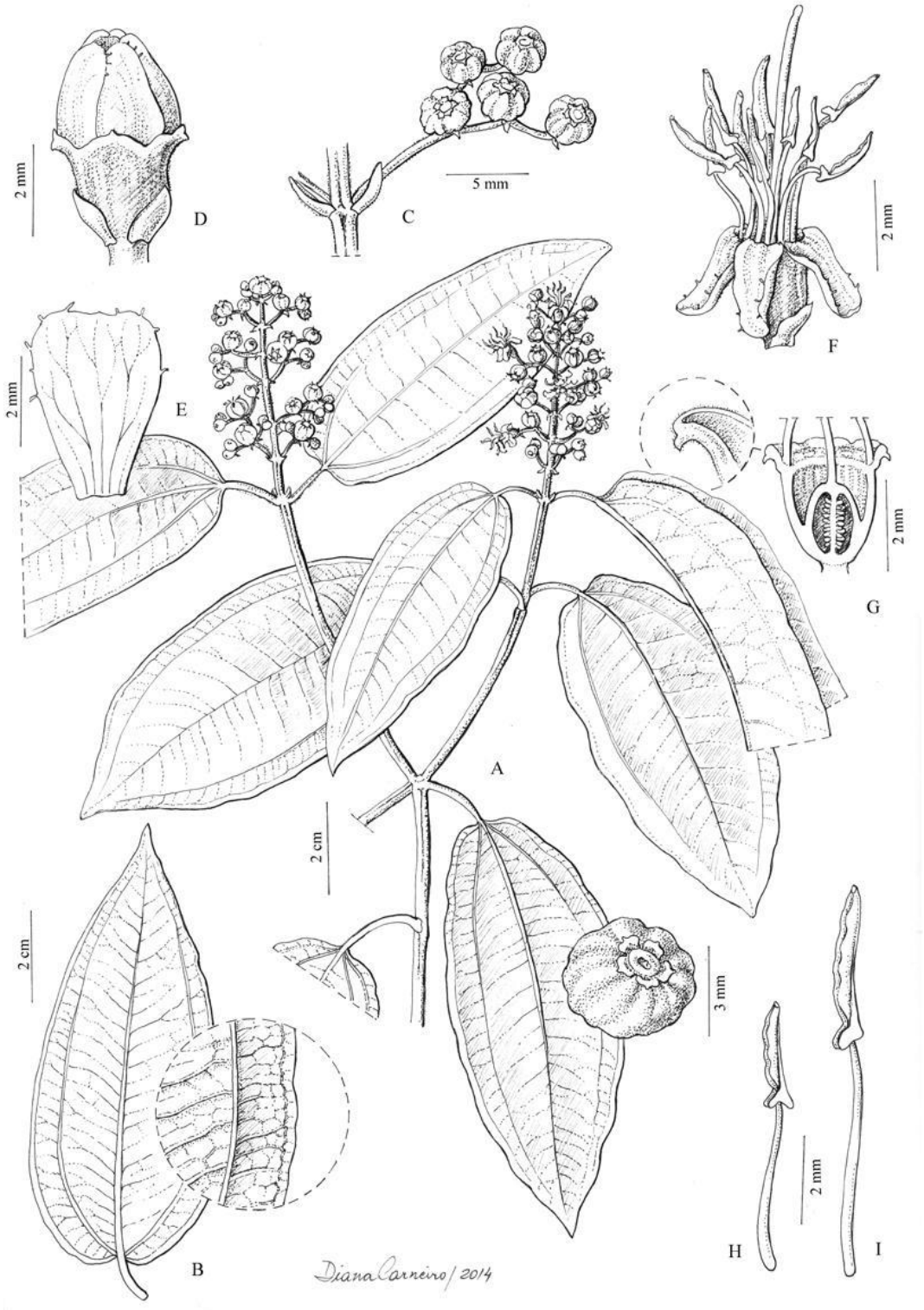

FIGURA 39. A-I. *Miconia macuxi* A. Fertile branch. B. Leaf with nerves detail. C. Inflorescence branch. D. Bud. E. Petal. F. Flower. G. Hypanthium and ovary in longitudinal section. H. Antepetalous stamen. I. Antesepalous stamen. A-I: *Caddah & Meirelles 900* (UPCB). Extracted from Meirelles et al. 2015.

11. *Miconia mayarae* Meirelles & R. Goldenb., stat. nov, et *nom. nov.* Basionym: *Miconia argyrophylla* ssp. *gracilis* Wurdack, Mem. New York Bot. Gard. 10 (4): 37 (1961). Type:—BRAZIL. Serra do Navio. Holotype: *Cowan 38428* (NY!); isotypes: RB! US! Non *Miconia gracilis* Triana.

Treelets up to 8 m high; branches, petioles and inflorescence densely covered by grayish amorphous trichomes. Branches rounded. Petioles 0.5–1 cm long. Blades 5–18 × 2.6–7.5 cm, lanceolate to elliptic, apex caudate, base acute, margin entire, adaxial surface glabrous, abaxial surface densely covered by amorphous trichomes, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 8.2–12 × 2.4–3.5 cm, terminal, branches bifid second subscorpioid, 1–1.5 cm long; bracts and bracteoles deciduous. Flowers 4-5-merous. Hypanthium 1.3–1.7 mm long, campanulate, externally covered by whitish bifid trichomes inner surface and torus glabrous. Calyx inner lobes broadly triangulars, persistent in fruit, inner surface glabrous, tube 0.3–0.4 mm long, outer lobes 0.4–0.5 mm long, apex with a tooth. Petals 1.4–1.8 × 0.6–0.9 mm, margins glandular-ciliate. Stamens white, slightly dimorphic, filaments in the antesepalous stamens 2–2.2 mm long, in the antepetalous 1.4–1.6 mm long, both glabrous; connectives prolonged below the thecae 0.2–0.3 mm long in the antesepalous and not prolonged in the antepetalous, with bilobated appendages in the antesepalous, and a dorsal spur in the antepetalous; anthers 1.9–2 mm long in the antesepalous and ca. 1.3 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined in the antessepalous and dorsally inclined in the antepetalous pore, ca. 0.1 mm diam. Ovary 0.9–1.2mm long, 1/2 adherent to the hypanthium, 3-locular, apex glabrous. Style 4.2–4.8 mm long, straight, stigma truncate, glabrous. Fruits baccate, 3–5.2 mm diam., purplish black when ripe, 25–37 seeds.

Additional specimens examined: BRAZIL. Acre: Sena Madureira, 1 Oct 1968, *Prance 7709* (INPA, K, MG, NY, P). Tarauacá, 21 Set 1968, *Prance 7442* (K, MG, NY). **Amapá:** Macapá, 17 Apr 1977, *Rosa 1777* (MG, NY, RB). 16 Nov 1954, *Cowan 38345* (IAN, NY). “Munguba”, 23 Jan 1978, *Santos 215* (INPA, MG, NY). “Rio Amapari”, 17 Nov 1954, *Cowan 38380* (NY, W). **Amazonas:** "Abuna", 19 Oct 1923, *Kuhlmann 666* (RB). Manaus, 31 Oct 1961, *Rodrigues 2723* (US), 11 Nov 1988, *Boom 8555* (INPA, K), 5 Nov 1991, *Oliveira 203* (INPA), 28 Jan 1992, *Nee 42343* (INPA, NY), 12 Feb 1992, *Nee 42503* (INPA, NY), 26-Mar-1992, *Dick 76* (INPA, NY). 24 Nov 1974, *Gentry 12887* (INPA, NY). **Pará:** "Arakai Mountains", 18 Jan 1938, *Smith 2933* (K, NY, P). Melgaço, 24 Nov 1994,

Silva 3134 (INPA, MG). Santarém, 30 Nov 1966, *Cavalcante 1471* (MG). **Rondônia:** "Chapada dos Parecis", 28 Oct 1979, *Vieira 748* (INPA, MG, NY). Guajará Mirim, 11 Apr 1987, *Nee 34773* (NY). Mirante da Serra, 13 Nov 1997, *Lobato 2028* (MG). Santa Bárbara, 26 May 1982, *Teixeira 793* (MG, NY, RB). **Roraima:** "Serra da Lua", 23 Jan 1969, *Prance 9377* (INPA, MG, NY, P). **BRITISH GUIANA.** "Basin of Essequibo River", 15 Dec 1937, *Smith 2712* (P-P05313631), 15 Dec 1937, *Smith 2678* (US). "Northwstern portion of Kanuku Mountains", 22 Apr 1938, *Smith 3664* (IAN, P, US). Upper Taakutu-Upper Essequibo, 12 Mar 1994, *Henkel 5160* (US), 16 Nov 1996, Clarke 3331 (US). **FRENCH GUIANA.** Camp Eugène, 6 Feb 1995, *Granville 12778* (NY). "Circouit Orstom", 14 Oct 1972, *Granville 4580* (P). Crique Limonade,1 Apr 2009, *Tostain 2779* (P). Crique Nouciri, 6 Dec 1983, *Cremers 8318* (P, US). "Oyapock rivé Brésilienne", 16 Dec 1967, *Oldeman 2721* (P). "Pic Matecho", 2001, *Hequet 993* (P). "Reserve Naturelle des Nouragues, 2 Sep 2004, *Granville 16622* (P)."Riviere Camopi", 4 Dec 1967, *Oldeman 2523* (P), 13 Dec 1967, *Oldeman 2674* (P). "Route Régina-Saint Georges", 24 Nov 1995, *Granville 13108* (P). Saul, 20 Jan 1980, *Granville 3319* (P, US). "Station d´ecotourisme de l´Aratai", 10 Nov 2001, *Granville 14562* (P, US). **SURINAME.** Jodensavanna, 21 Dec 1960, *Schulz 8505* (US). **VENEZUELA. Bolívar:** San Ignacio de Yuruani, 7 May 1988, *Liesner 24341* (US). Carabobo, Mora, 18 May 1991, *Diaz 373* (US).

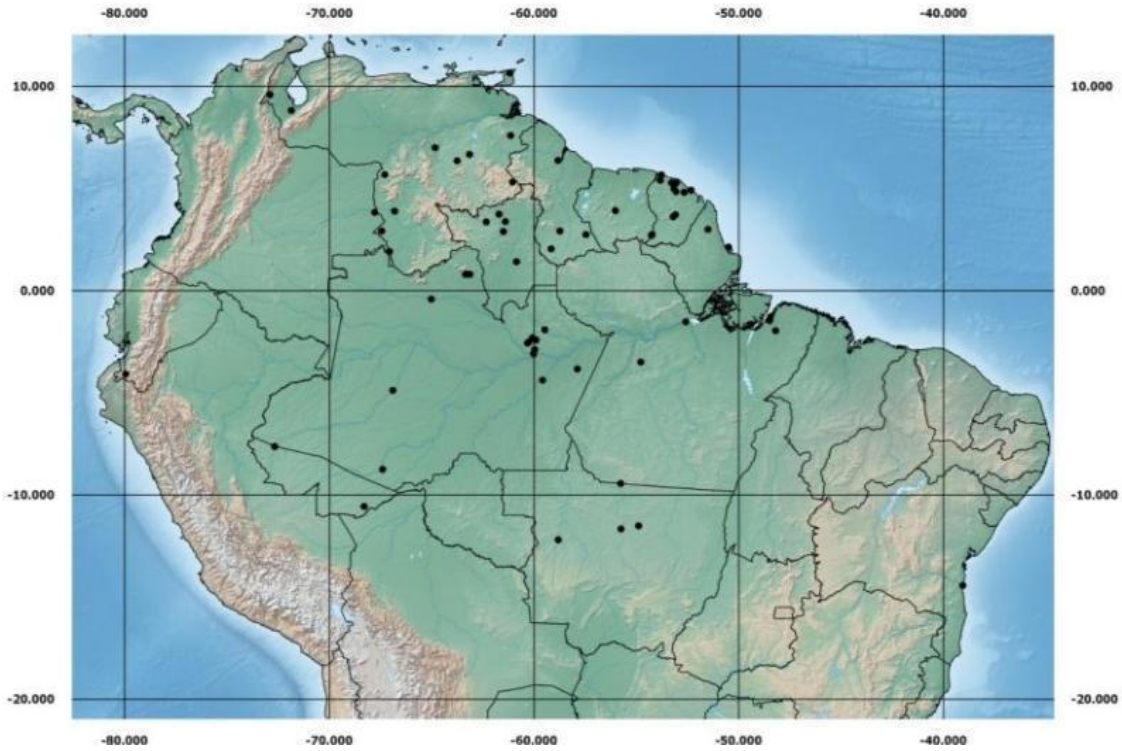

FIGURE 40. Distribution of *Miconia mayarae*.

Illustration:—Figures (41-42).

Habitat, distribuição e ecologia:— *Miconia mayarae* occurs in the understory of Amazonian forest and also in campinaranas on sandy soil.

Etymology:—*Miconia mayarae* honors the botanist, and Melastomataceae expert, Mayara K. Caddah.

Discussion:—The features used by Wurdack to distinguish *Miconia argyrophylla* subsp. *gracilis* were the cilindric branches (*vs*. acute quadrangular branches in the typical *M. argyrophylla*) and the main inflorescence axes, which is narrower and more delicate in subsp. *gracilis*. We found additional differences between these taxa, and, for this reason, changed its subspecies status to species. To do this, a new name was necessary because the subspecies epithet is already in use (*Miconia gracilis* Triana). Additional features that distinguish these species are the trunk (cylindric in *M. mayarae vs.* with four grooves in *M. argyrophyla*), leaves (smaller and thinner in *M. mayarae*), indument (predominantly grayish in *M. mayarae vs.* predominantly tawny in *M. argyrophylla*), fewer flowers per inflorescence in *M. mayarae* (due to the reduced size of the branches compared to *M. argyrophylla*) and ovary apex (rounded in *M. mayarae vs.* apex with projections in the form of a crown in *M. argyrophylla*).

FIGURE 41. *Miconia mayarae.* A. Fertile branch. B. Young inflorescence. C. Abaxial surface of leaves. D. Trunk.

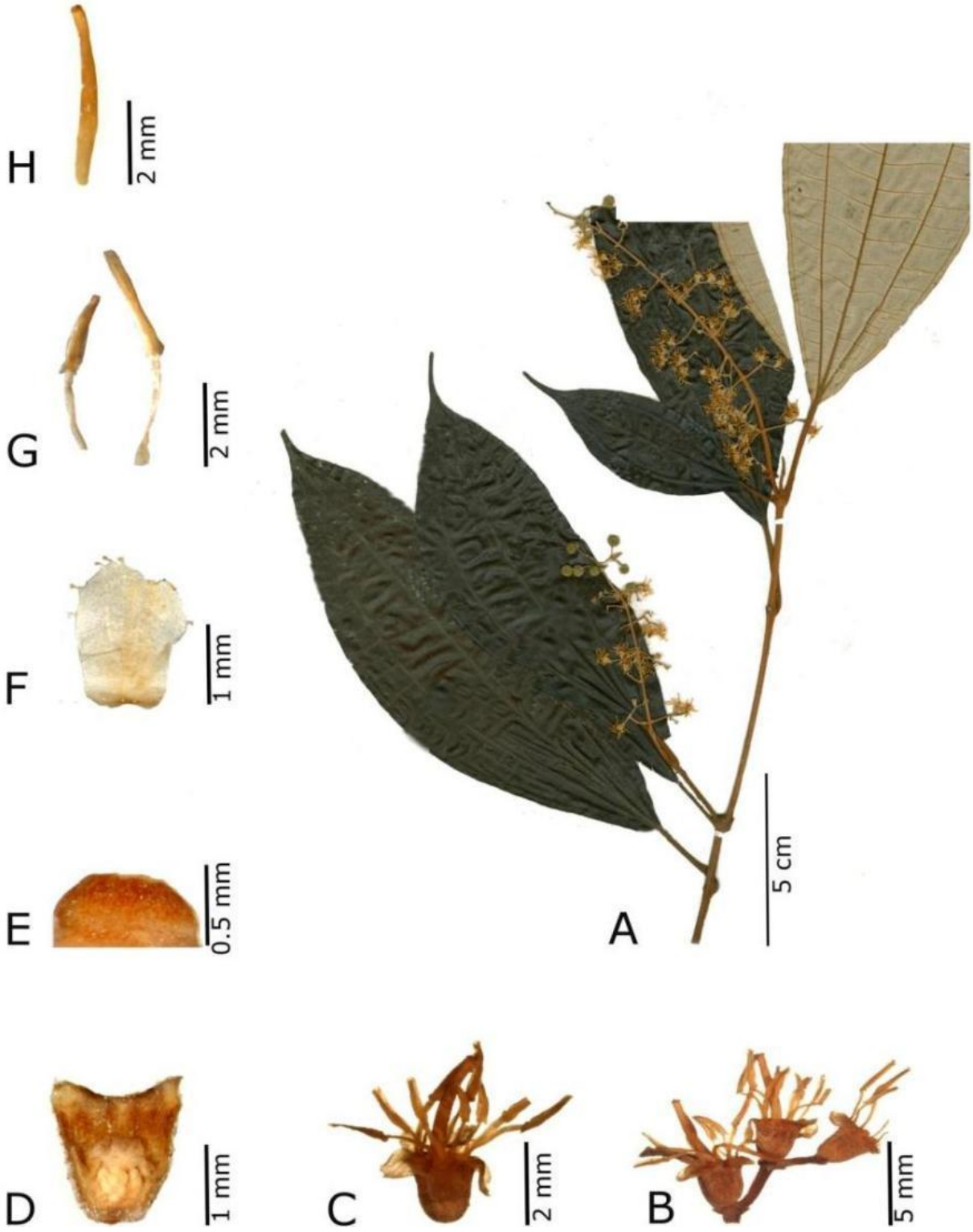

FIGURE 42. A-G. *Miconia mayarae*. A. Fertile branch (Cowan 38428, US). B. Inflorescence branch. C. Flower. D. Hypanthium in longitudinal section with ovary. E. Ovary apex. F. Petal. G. Stamens. H. Style (B-H: *Smith 26780*, NY).

12. *Miconia navioensis* Wurdack, Mem. New York Bot. Gard. 10 (4): 38 (1961). Type:—BRAZIL. Amapá. Holotype: *Cowan 38118* (NY!); isotypes: F-image!, RB!, S-image!, US!

Treelets up to 15 m high; branches, petioles abaxial surface of leaves, inflorescence and hypanthium densely covered by withish amorphous hairs. Branches rounded Petioles 0.4–2.3 cm long. Blades 4.9–16.7 × 3–8.4 cm, elliptic to oblong, apex acute to slightly acuminate, base acute to round, margin entire, adaxially covered with amorphous trichomes when young, after glabrous, longitudinal nerves 5, with an additional faint, marginal pair, basal. Panicles 6.5–9.3 × 3.1–5.6 cm, terminal, branches secund bifid subscorpioid, 1.2–3.5 cm long; bracts and bracteoles deciduous. Flowers 5–merous. Hypanthium 1.5–1.9 mm long, campanulate, inner surface and torus glabrous. Calyx inner lobes triangulars, persistent in fruit, inner surface glabrous, tube 0.2–0.5 mm long, outer lobes 0.6–0.7 mm long, apex with a tooth. Petals 1.6– 1.8 × 0.9–1.2 mm, margins glabrous. Stamens white, dimorphic, filaments in the antesepalous stamens 2.2–2.6 mm long, in the antepetalous 1.7–2.1 mm long, both glabrous; connectives prolonged below the thecae 0.6–0.8 mm long in the antesepalous and 0.4–0.6 mm long in the antepetalous, with a dorsal rounded projection in the antesepalous, and two small, ventral lobules and a dorsal spur in the antepetalous; anthers 2–2.3 mm long in the antesepalous and 1.4–1.7 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined large longitudinal expanded pore, 0.4–0.5 mm diam. Ovary 1.1–1.3 mm long, 1/2 adherent to the hypanthium, 3-locular, apex glabrous. Style 3.2–3.5 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, 2.8–3.2 mm diam., color unknown when ripe, 4–13 seeds.

Additional specimens examined:—BRAZIL. Amapá: Camaipi, s.d., *Mori 15950* (NY), 20 Sep 1983, *Mori. 16448* (NY). Macapá, 4 Jan 1985, *Mori 17670* (K, MG, NY). Mazagão, 5 Apr 1982, *Rosa 4137* (MG, NY), 20 Dec 1984, Rabelo 3049 (K, MG, NY, US). **Amazonas:** Manaus, 18 Oct 1980, *s.c. s.n.* (US). Novo Airão, 15 Oct 1989, *Miller 774* (INPA, K, US). Presidente Figueiredo, 22 Sep 1986, *Ferreira 8241* (INPA, K, MG, NY, US). **Maranhão:** São Luís, Feb 1939, *Krukoff 11758* (NY). **Pará:** Barcarena, 21 Nov 2001, *Bastos 2435* (MG). Belterra, 29 Oct 1947, *Black 47-1853* (US), 29 Oct 1947, *Black 47-1868* (NY). 16 Oct 2012, *Meirelles 900* (JOI, RB, UEC, UPCB). Novo Repartimento, 30 Oct 1981 , *Daly*

1101 (INPA, MG, NY, US). Óbidos, 1918, *Lecointe 17300* (MG), *Lecointe s.n.* (P-P05319292, P05319293, US). Oriximiná, 11 Nov 1987, *Ferreira 9538* (INPA, K, MG, NY, US), 16 Jan 2003, *Salomão 899* (MG). Peixe-Boi, 11 Mar 1991, *Salomão 790* (MG). "Rio Jarí", 13 Nov 1967, *Oliveira 3516* (NY). "Rodovia Belém-Brasília Km 92", 15 Sep 1959, *Kuhlmann 238* (IAN, MG). Santarém, 19 Jan 1979, *Santos 566* (MG, NY)."Sete Varas airstrip on Rio Curua", 9 Aug 1981, *Strudwick 4419* (INPA, MG, NY), 7 Aug 1981, *Strudwick 4316* (INPA, MG, NY), *Costa 221* (NY). Tucuruí, 5 Jun 1980, *Silva 5374* (MG, NY, RB), Apr 1981, *Bastos 321* (MG), 30 Oct 1981, Daly 1101 (INPA).

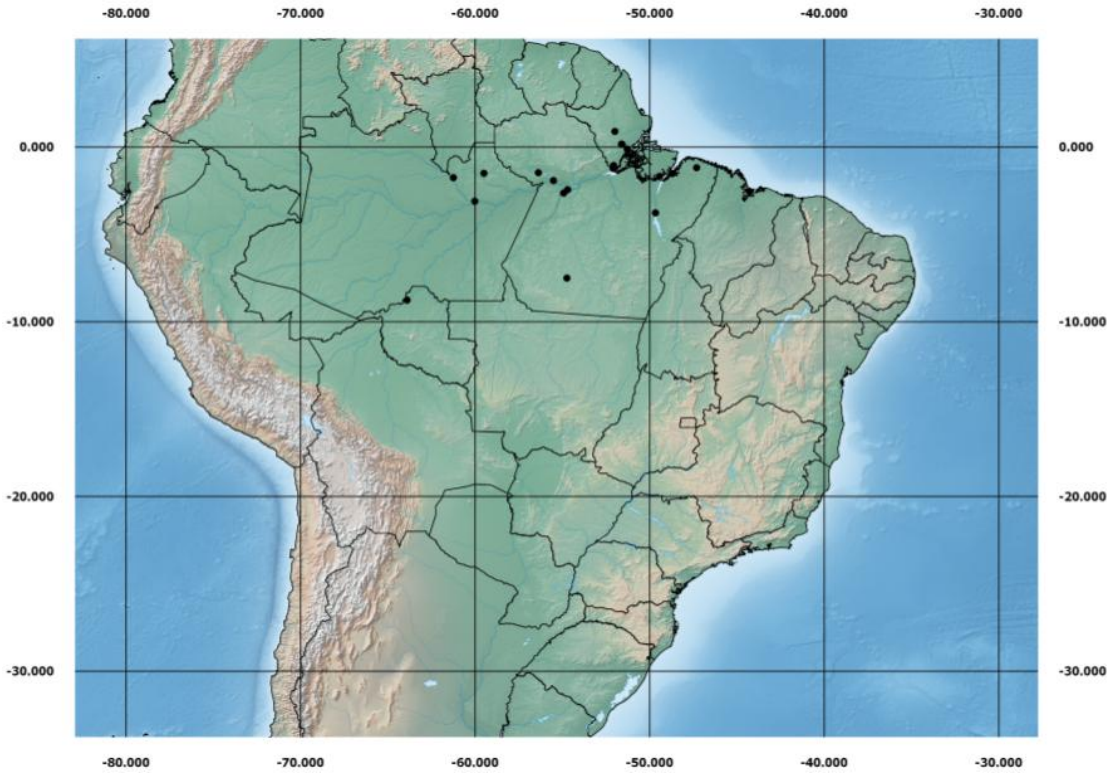

FIGURE 43. Distribution of *Miconia navioensis*.

Illustration:—Figures (44-45).

Habitat, distribution and ecology:—*Miconia navioensis* occurs in Amazonia Brazil.

Discussion:—*Miconia navioensis* is close to *M. lourteigiana* (see comments under *M. lourteigiana*). It is also similar to *M. albicans,* but differs by the leaves that are usually larger and often with an acute apex (*vs.* rounded to acuminate in *M. albicans*) and by the stamens with a ventrally expanded pore similar to a slit (*vs.* apical pore in *M. albicans*).

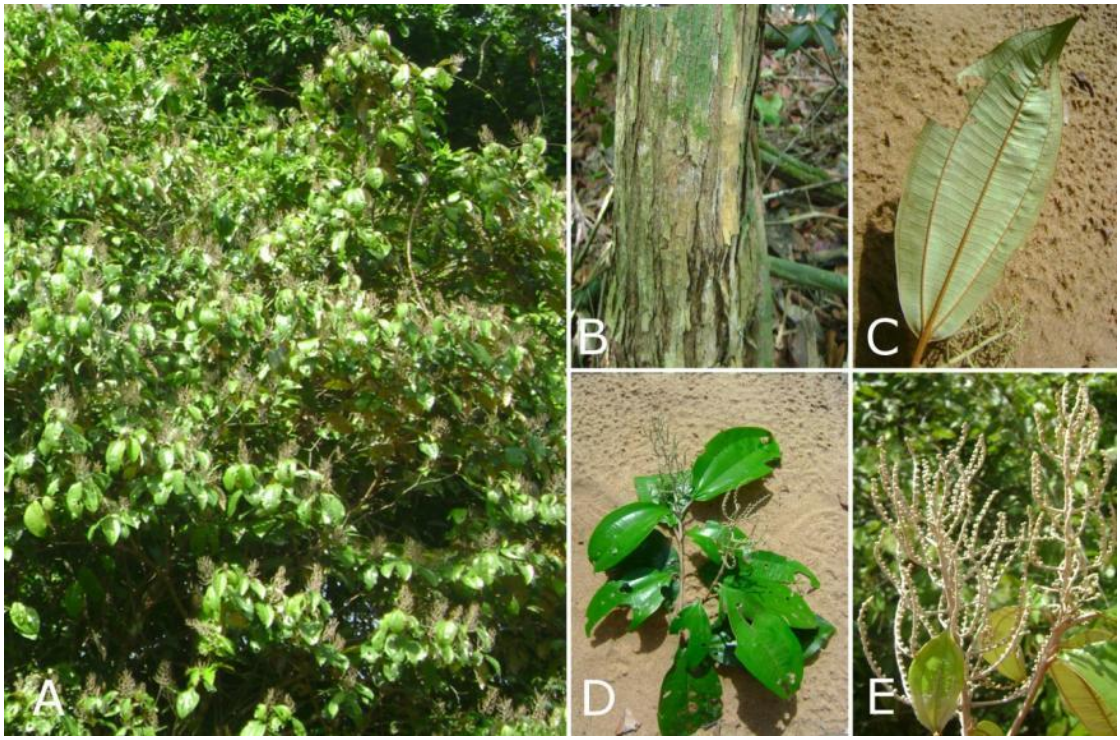

FIGURE 44. A-E. *Miconia navioensis*. A. Treetop. B. Trunk. C. Abaxial surface of leaf. D. Branch. E. Inflorescence.

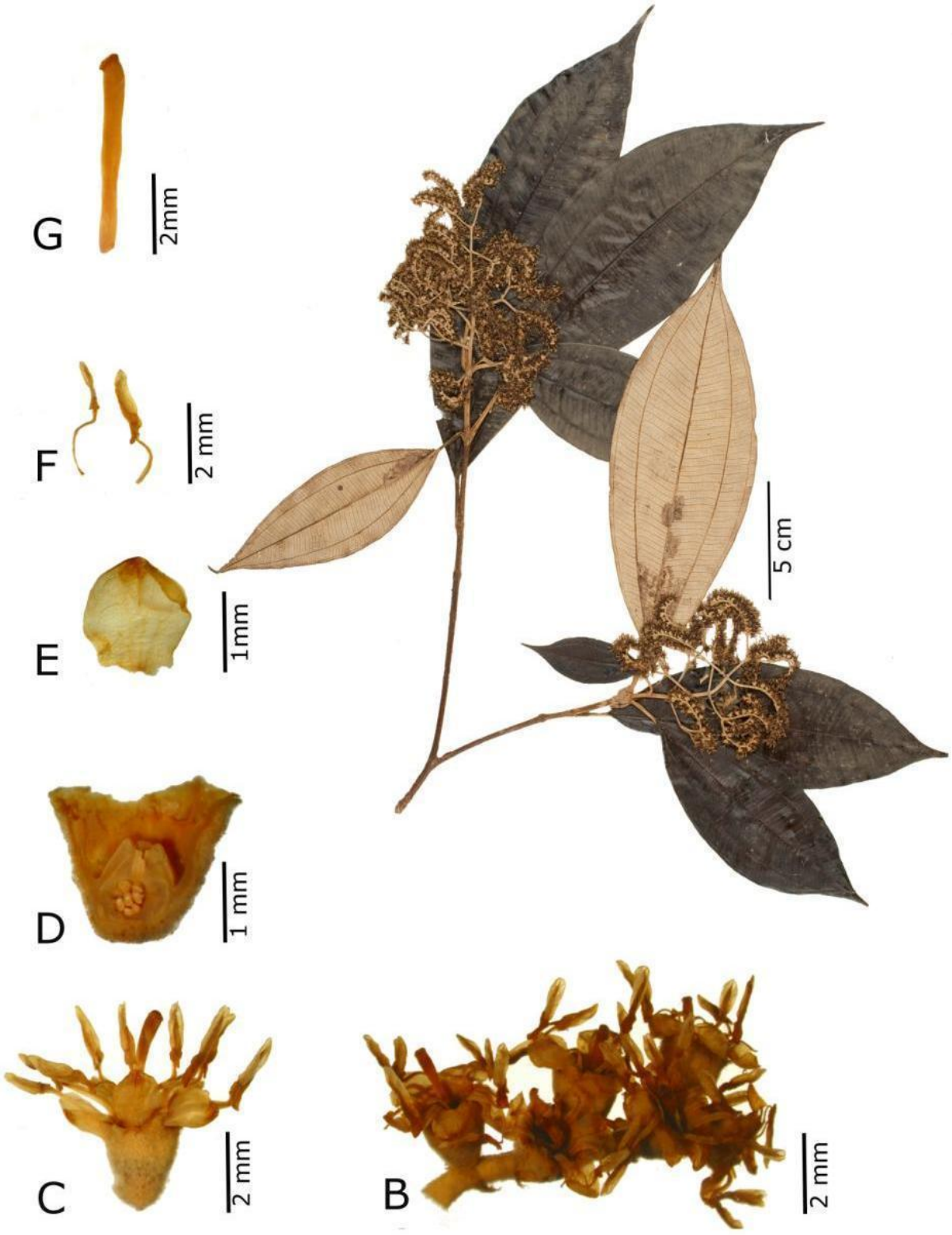

FIGURE 45. A-G. *Miconia navioensis*. A. Fertile branch. B. Inflorescence branch. C. Flower. D. Hypanthium in longitudinal section with ovary. E. Petal. F. Stamens. G. Style.

13. *Miconia pterocaulon* Triana, Trans., Linn. Soc. London 28: 114 (1871). *Acinodendron pterocaulon* (Triana) Kuntze, Revis. Gen. Pl. 2: 952 (1891). Type:—COLÔMBIA. Lectotype designated here: *Triana 3988* (K!); isolectotypes: COL-image!, GDC!, IAN!, P!

Trees up to 7 m high; branches, petioles, inflorescence and external surface of hypanthium densely covered by brownwish amorphous hairs. Branches quadrangulars, winged, wings ca. 1 mm compr. Petioles 2–4.7 cm long. Blades 17.5 –20.2 × 7.6–13.7 cm, obovate, apex acuminate, base acute to rounded, margin entire, adaxial surface glabrous, abaxial surface densely covered by a thin layer of amorphous trichomes, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 8–24 x 3.2–4.5 cm, terminal, branches bifid subscorpioid, 0.6–1.7 cm long; bracts and bracteoles persistent. Flowers 5-merous (calyx in fruit). Flowers not seen. Fruits baccate, 2.1–4.4 mm diam., color unknown when ripe, 19–22 seeds.

Additional specimens examined:—BRAZIL. Acre: Mâncio Lima, 13 Nov 2007, *Goldenberg 971* (NY, RB, UPCB). **COLOMBIA. Amazonas**: Araracuara, 19 Apr 1986, *Galeano 924* (US). **Antioquia:** Planta Providencia, 22 Jul 1974, *Denslow 2346* (US). Remedios, 4 Jul 1989, *Callejas 8104* (NY, US). **Colombia: Caquetá:** Solano, 4 Mar 1945, *Little 9528* (US). **Meta:** "Cordillera La Marcarena", 20 Dec 1950, *Idrobo 780* (US)."Sierra de la Macarena", 24 Nov 1949, *Philipson 1554* (IAN, US). 3 Feb 1950, *Philipson 2347* (US). **Valle:** Alto Yunda, Jun 1972, *Hilty J-37* (US). **Vaupés:** San Joaquín, 27 Jan 1933, *Fernández 1992* (US). **COSTA RICA. Cartago:** Turrialba, 14 Jan 2001, *Mora 1750* (NY). **EQUADOR. Napo:** 9 Jan 1988, *Cerón 3225* (US), 11 Jan 1988, *Coello 62* (NY), 16 May 1988, *Renner 89081* (US). **PERU. Amazonas:** Bagua, 22 Sep 1994, *Jaramillo 462* (NY), 27 Aug 1996, *Santibañez 7998* (NY). **Huánuco:** Huánuco, 30 Aug 1940, *Asplund 13392* (US), Leoncio Prado, 5 Apr 1978, *Schunke 10088* (US). **Iquitos:** "Rio Nanay", 13 Jan 1976, *MacDaniel 20442* (US). **Loreto:** Maynas, 3 Jan 1981, *Vásquez 1159* (NY, US). Rio Yuvineto", 5 Jan 1978, *Barrier 288* (G, P), 17 Jan 1978, *Barrier 378* (P), 28 Mar 1978, *Haxaire 826* (G, P). **Pastaza:** Lorocachi, 27 May 1980, *Jaramillo 31302* (US). San Martín: Tocache Nuevo, 6 May 1980, *Schunke-Vigo 11569* (US). **Sucumbíos**: 26 Mar 1989, *Balslev 84658* (NY). Gonzalo Pizarro Canton, 23 Mar 1990, *Cerón 9255* (US). **VENEZUELA. Apure:** "Reserva Florestal San Camilo", 26 Mar 1968, *Steyermark 101307* (P, US). **Táchira:** La Fundación, 29 Apr 1981, *Liesner 11559* (NY). "Rio San Buena", 13 Mar 1980, *Liesner 9586* (US). San Cristóbal, 20 Mar 1981, *Liesner 10852* (NY, US).

FIGURE 46. Distribution of *Miconia pterocaulon*.

Illustration:—Figure (47).

Habitat, distribution and ecology:—*Miconia pterocaulon* occurs in Amazon forest from Costa Rica to Peru.

Discussion:—*Miconia pterocaulon* resembles *M. argyrophylla* due to the quadrangular branches and long leaves with basal nerves. It differs because of the winged branches and sparse grayish indument (vs. dense tawny indument of *M. argyrophylla*). It also has a more restricted area of occurrence on the western side of the Amazon. *Miconia pterocaulon* occurs at elevations between 150 and 600 m, while *M. argyrophylla* is common at lower elevations.

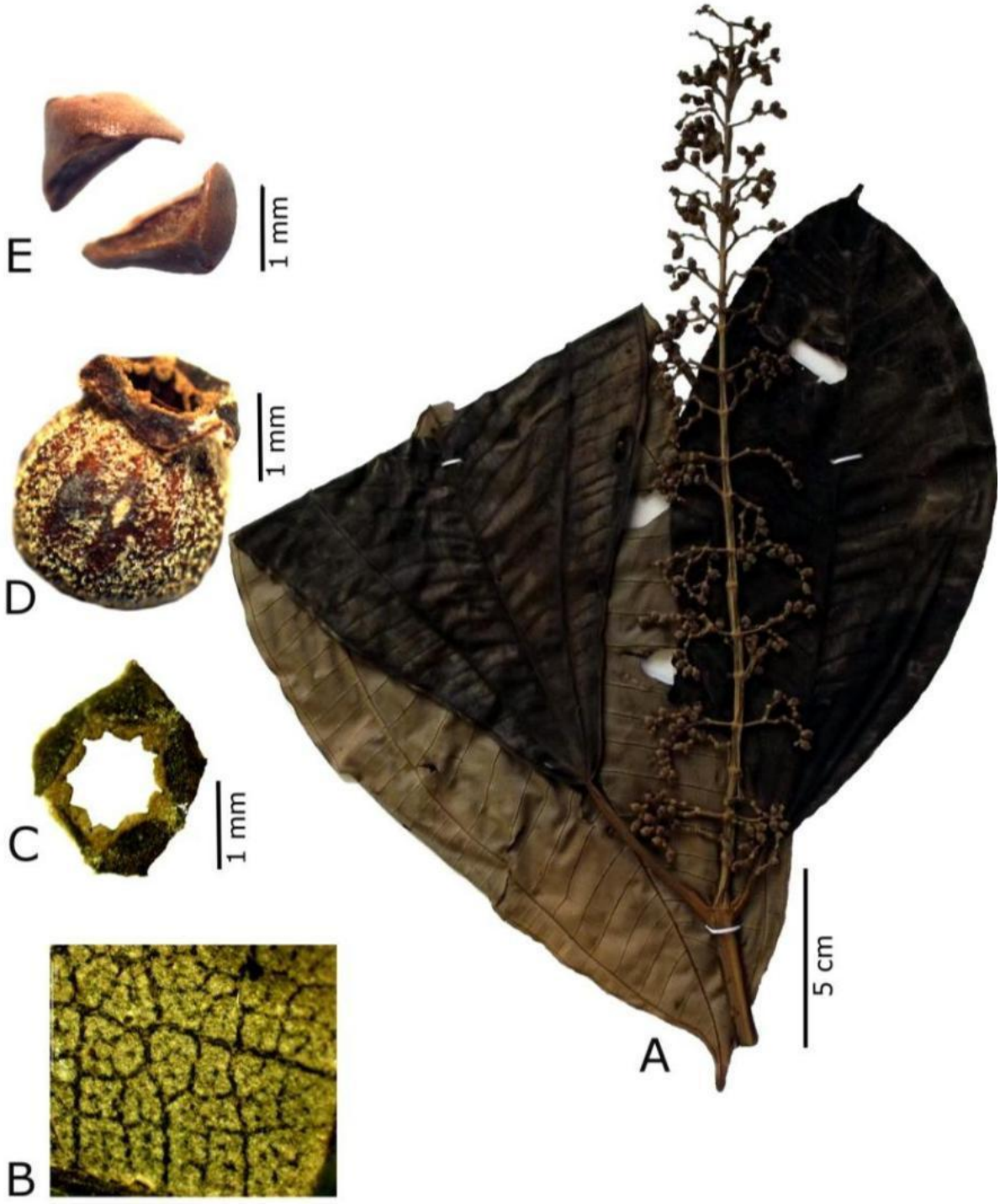

FIGURE 47. A-E: *Miconia pterocaulon*. A. Fertile branch. B. Detail of indument in the abaxial surface of leaf. C. Calyx after released of fruit. D. Fruit. E. Seeds (A-E: *Goldenberg 971* UPCB).

14. ***Miconia secundiflora*** **Cogn.** in Martius, Fl. bras. 14 (4): 285 pl. 58 (1887). Acinodendron secundiflorum (Cogn.) Kuntze, Revis. Gen. Pl. 2: 952 (1891). Type:—BRAZIL. Pará. Lectotype designated here: *Riedel 1548* (BR!). isolectotypes: F-image!, K!, LE fide Goldenberg *et al.* (2013).

Treelets up to 4.5 m high; branches. petioles, abaxial surface of leaves, inflorescence and hypanthium densely covered by amorphous whitish trichomes. Branches rounded. Leaves sessile. Blades 6.5–15.5 × 4.3–12 cm, elliptic to oblong, apex cuneate, base auriculate, margin slightly dentate, adaxial surface of leave glabrous, longitudinal nerves 5, with an additional faint, marginal pair, suprabasal. Thyrses 4.5–15 × 5–7 cm, terminal to pseudolateral, branches bifid and secund subscorpioid, 1.3–4.5 cm long. bracts and bracteoles persistent. Flowers 5-merous. Hypanthium 2–2.1 mm long, campanulate, inner surface glabrous. torus glabrous. Calyx inner lobes triangulars, persistent in fruit, inner surface glabrous, tube 0.1–0.3 mm long, lobes 0.4–0.5 mm long, outer teeth lobes. Petals 2.9–3.3 × 1.4–2 mm, margins glabrous. Stamens white, dimorphic. filaments in the antesepalous stamens 3.6–3.9 mm long, in the antepetalous 2.9–3.2 mm long, both glabrous. connectives prolonged below the thecae 0.4–0.5 mm long in the antesepalous and 0.5–0.7 mm long in the antepetalous, with two big ventral appendages with in the antesepalous stamens and two small, ventral, appendages and a dorsal spur in the antepetalous. Anthers 2.4–2.5 mm long in the antesepalous and 2.1–2.3 mm long in the antepetalous oblong, with a single terminal, ventrally inclined pore, ca. 0.2 mm diam. Ovary ca. 1.2 mm long, 1/3 adherent to the hypanthium, 3-locular, apex glabrous. style 6.1–6.6 mm long, straight, stigma slightly expanded, glabrous. Fruits baccate, (2) 3–5 mm diam., color unknown when ripe, 26–38 seeds.

Additional specimens examined:—BRAZIL. Pará: s.l., 2 Nov 1902, *Snethlage s.n.* (MG, RB). Altamira, 24 Oct 1986, *Souza 467* (MG); 25 Oct 1986, *Dias 459* (MG). Igarapé Açú, 25 Nov 1952, *Pires 4397* (IAN, NY). Belterra, 23 Dec 1956, *Pires 6515* (IAN); 4 Dec 1978, *Lobo 92* (MG, NY, US). Monte Alegre, 15 Aug 1955, *Black 55-18701* (IAN); 14 Aug 1968, *Silva 1545* (MG); 19 March 1973, *Oliveira 6066* (MG); 24 January 1997, *Silva 883* (MG). Óbidos, 5 November 1919, *Ducke s.n.* (RB); 10 May 1957, *Black 57-19426* (IAN). Oriximiná, 15 Jan 1968, *Silva 1158* (MG). Santarém, 1821, *Riedel 231* (NY); Dec 1828, *Riedel 1548* (BR, K); 16 Nov 1909, *Huber 10443* (MG); 1927, *Ginzberger s.n.* (W); 18 Aug 1955, *Black 55-18734* (IAN, NY); 19 Aug 1955, *Black 55-18728* (IAN); 25 Dec 1956, *Pires 6488* (IAN, NY, US); Oct 1958, *Schnell 9086* (NY, P); 11 Dec 1966, *Cavalcante 1670* (MG);

17 Aug 1968, *Silva 1621* (MG); 10 Aug 1969, *Silva 2203* (MG, NY, US); 10 Aug 1969, *Silva 2204* (MG, NY, US); 26 Nov 1973, *Traill 266* (K); 9 Dec 1978, *Maciel 231* (INPA, MG, NY); 9 Dec 1978, *Vilhena 188* (MG, NY, US); 12 Dec 1978, *Vilhena 226* (MG, NY, US); 28 Feb 1986, *Ackerly 184* (NY); 27 Aug 1987, *Miranda 4* (INPA); 29 Oct 1999, *Costa s.n.* (INPA); 13 Oct 2012, *Meirelles 858* (RB).

FIGURE 48. Distribution of *Miconia secundiflora*.

Illustration:—Cogniaux (1887): Plate (58). Cover water mark image and Figures (49-50).

Habitat, distribution and ecology:—*Miconia secundiflora* is endemic to campinaranas (forests on white-sand soils in the Amazon) in state of Pará, Brazil.

Discussion:—*Miconia secundiflora* is easily recognized in albicans clade by its leaves that are sessile, with an auriculate base, and has suprabasal veins and a ciliate margin.

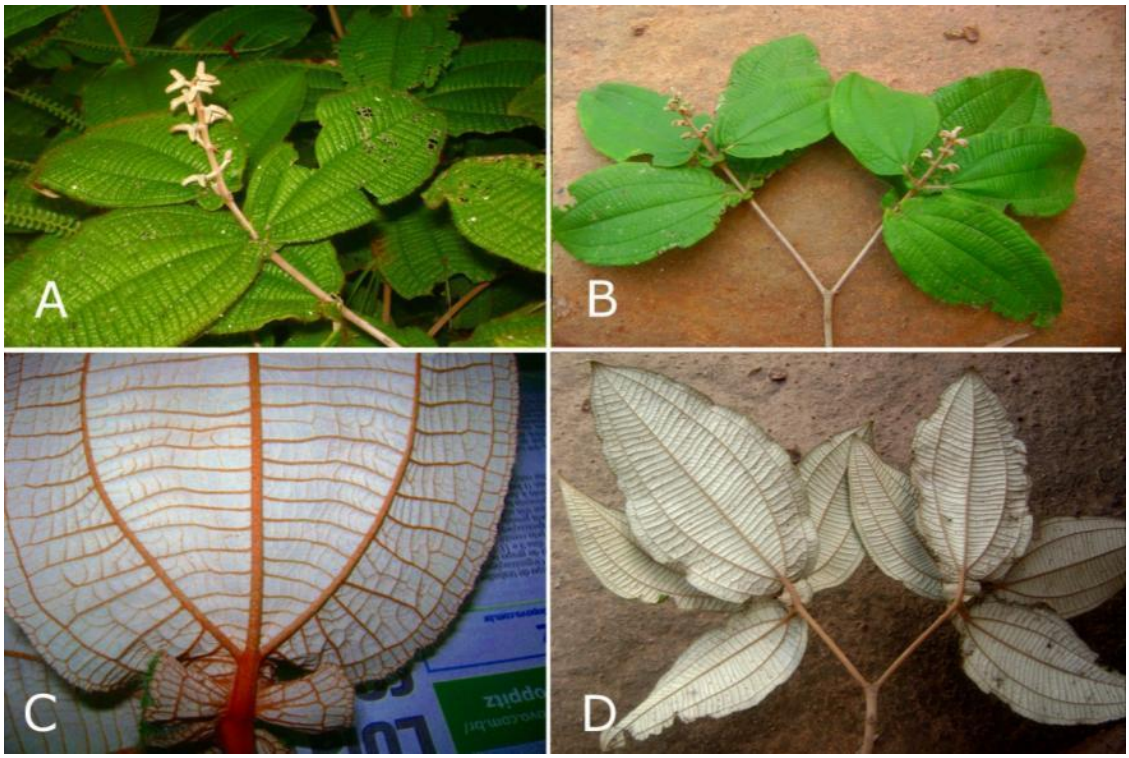

FIGURE 49. *Miconia secundiflora*. A.-B. Fertile branch. C. Detail of leaf base and secondary nerves. D. Abaxial surface of leaves.

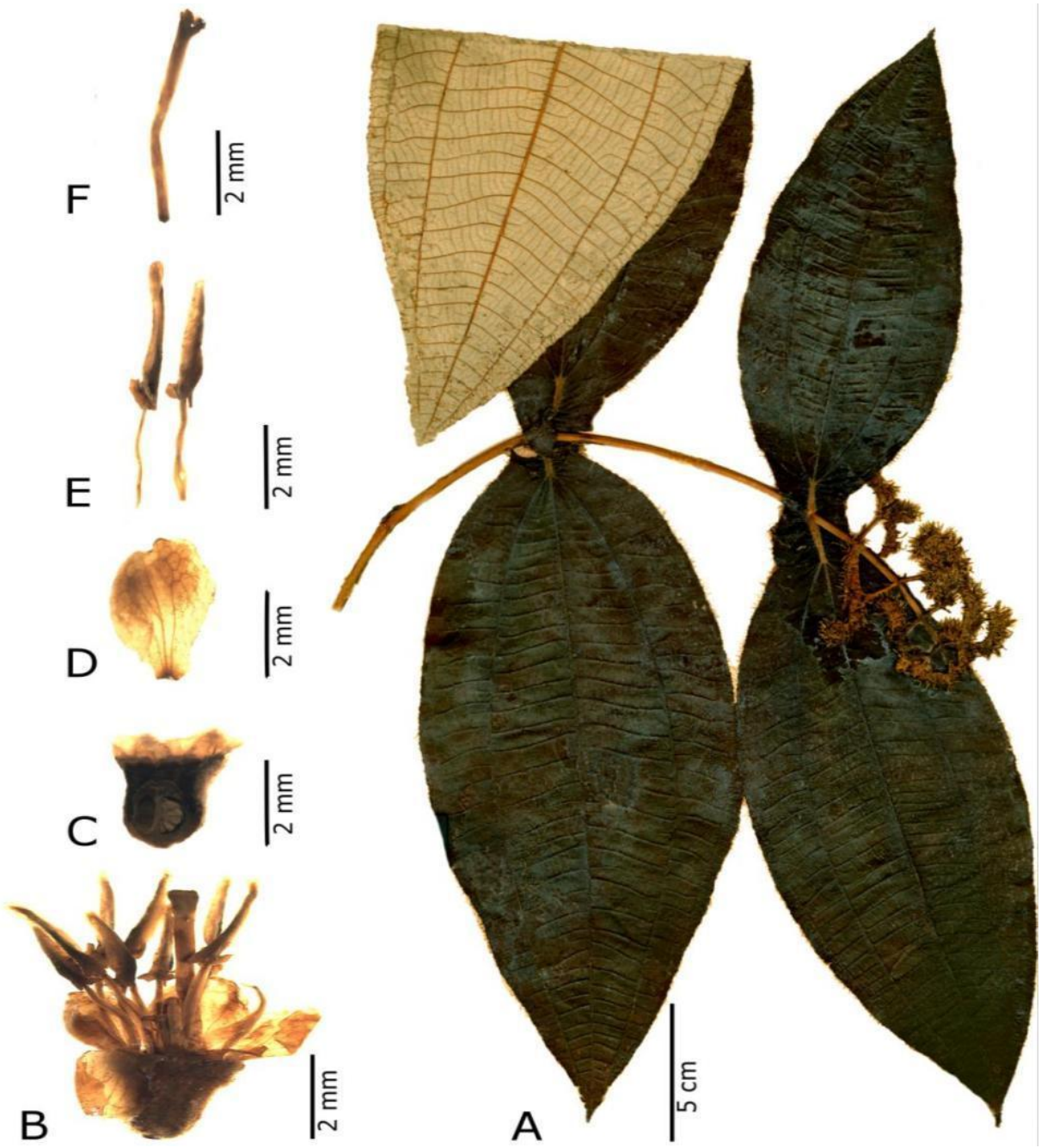

FIGURE 50. A-G: *Miconia secundiflora*. A. Fertile branch (*Traill 266* K). B. Flower. C. Hypanthium in longitudinal section with ovary. D. Petal. E. Stamens. F. Style.

15. *Miconia serialis* DC., Prodr. 3: 182 (1828). *Acinodendron seriale* (DC.) Kuntze, Revis. Gen. Pl. 2: 952 (1891). Type:—BRAZIL. Lectotype: *Ferreira s.n.* (P!).

Miconia tomentella Cogn. in Martius, Fl. bras. 14 (4): 284 (1887). *Acinodendron tomentellum* (Cogn.) Kuntze, Revis. Gen. Pl. 2: 953 (1891). Type:— SURINAME. Lectotype designated here: *Menze s.n.* (BR!).

Treelets to trees up to 8 m high; branches, petioles, abaxial surface of leaves, inflorescence and hypanthium densely covered by vermiform whitish trichomes. Petioles 0.5–1 cm long. Blades 11–23 × 2.8–5.3 cm, lanceolate, apex acuminate, base decurrent, margin entire to slightly revolute, adaxial surface of young leaves densely covered by amorphous withish trichomes, glabrous when mature, longitudinal nerves 3, with an additional faint, marginal pair, 2–20mm supra-basal. Thyrses 6–12 × 6.5–10 cm, terminal, branches bifid and secund subscorpioid, 2–4.7 cm long. bracts and bracteoles persistent. Flowers 5-merous. Hypanthium 1.7–2.3 mm long, campanulate, inner surface glabrous. torus glabrous. Calyx inner lobes triangulars, persistent in fruit, inner surface glabrous, tube 0.6–0.9 mm long, lobes 0.5–1.1 mm long, outer teeth lobes. Petals 2.2–2.4 × 1.6–2 mm, margins glabrous. Stamens white, dimorphic. filaments in the antesepalous stamens 2.9–3.2 mm long, in the antepetalous ca. 2.2 mm long, both glabrous. connectives prolonged below the thecae ca. 0.3 mm long in the antesepalous and 0.2–0.3 mm long in the antepetalous, with two big ventral appendages in the antesepalous stamens and two small, ventral, appendages and a dorsal spur in the antepetalous. anthers 2.3–2.8 mm long in the antesepalous and 2–2.5 mm long in the antepetalous oblong, with a single terminal, ventrally inclined pore, ca. 0.3 mm diam. Ovary ca. 1.7–1.9 mm long, 1/3 adherent to the hypanthium, 3-locular, apex sparsely glandular. Style 4.2–6.1 mm long, straight, slightly expadend in the apex, glabrous. Fruits baccate, 4–5 mm diam., color unknown when ripe, 20–24 seeds.

Additional specimens examined:—BRAZIL. Ceará: Baturité, 11 Nov 1939, *Eugênio 928* (RB, US). **Maranhão:** São Luiz, Feb 1939, *Froés 11508* (K, NY); 1 Jan 1940, *Froés 11729* (K, NY); 21 Jan 1993, Muniz 208 (RB). **Pará:** Belterra, 2 Dec 1978, *Lobo 26* (NY, US). Óbidos, 8 Nov 1919, *Ducke s.n.* (RB). Santarém, 5 Oct 1999, *Costa s.n.* (INPA). **Pernambuco:** Igarassu, 27 March 2008, *Gomes 229* (RB). Recife, 2 Feb 1996, *Lins 155* (RB); 4 Jan 2000, *Rodal 748* (NY); 4 Feb 2000, *Almeida 8* (NY, UPCB); 4 Feb 2000, *Almeida 20* (NY); 20 Dec 2001, *Almeida 233* (NY). **Roraima:** Caracaraí, 19 Oct 2011, *Meirelles 749* (INPA, NY); 19 Mar 2012, *Martinelli 17361* (RB). **Sergipe:** Japaratuba, 19 Jan

1991, *Landim 843* (RB). Santo Amaro das Brotas, 21 Jun 1991, *Farney 2750* (RB). São Cristovão, 12 Jun 2006, *Ribeiro 117* (RB); 28 April 2008, *Gomes 208* (RB). **FRENCH GUIANA.** Maroni, 1862, *Rech s.n.* (P-P05201043, P05201044, P05201045, US), 1877, *Crévaux s.n.* (P-P05201042). "Monts D'arawa": 26 Mar 2006, *Molino 2270* (US). **GUYANA**. "Monts d´Arawa", 15 Jul 2002, *Granville 15271* (P). **Kanuku**: Rupununi, 4 Jul 1995, *Jansen-Jacobs 4333* (NY, P). **Maroni:** 1862, *Melinon s.n.* (P-P05201047), **Rupununi:** Kwitaro, 16 Feb 1994, *Jansen-Jacobs 3822* (NY, P, US). **Upper Takutu-Upper Essequibo:** Essequibo, 2 Mar 1997, *Clarke 4075* (NY). Pakaraima, 29 Feb 1992, *Hoffmann 1091* (NY, US). Shea Village, 7 Feb 1997, *Clarke 3397* (INPA, NY). **SURINAME.** *Sagot s.n.* (W). 20 Jul 1986, *Sauvain 707* (US). Voltzberg, 21 Aug 1956, *Schulz 7785* (NY), 28 Jan 1999, *Granville 13745* (P). **Brokopondo:** Kabel Station, 15 Abr 1905, *Lanjouw 1278* (NY, US). **VENEZUELA. Amazonas:** Atures, 2 Dec 1992, *Gröger 587* (M, US). **Bolívar:** 13 May 1987, *Stergios 10331* (US). Anacoco, 19 Jan 1983, *Stergios 5364* (US). Aripao, 4 Jul 1995, *Rosales 2035* (US). "Cerro Cotorra", 5 Aug 1960, *Steyermark 86882* (NY); 5 Aug 1960, *Steyermark 86890* (US). Las Trincheras, 11 Jun 1984, *López-Palacios 4652* (NY). Piar, 28 Feb 1997, *Diaz 3128* (NY). **Delta amacuro:** Tucupita, 28 Mar 1979, *Davidse 16356* (US). **Miranda:** Quebradas Corozal, *Steyermark 116482* (US).

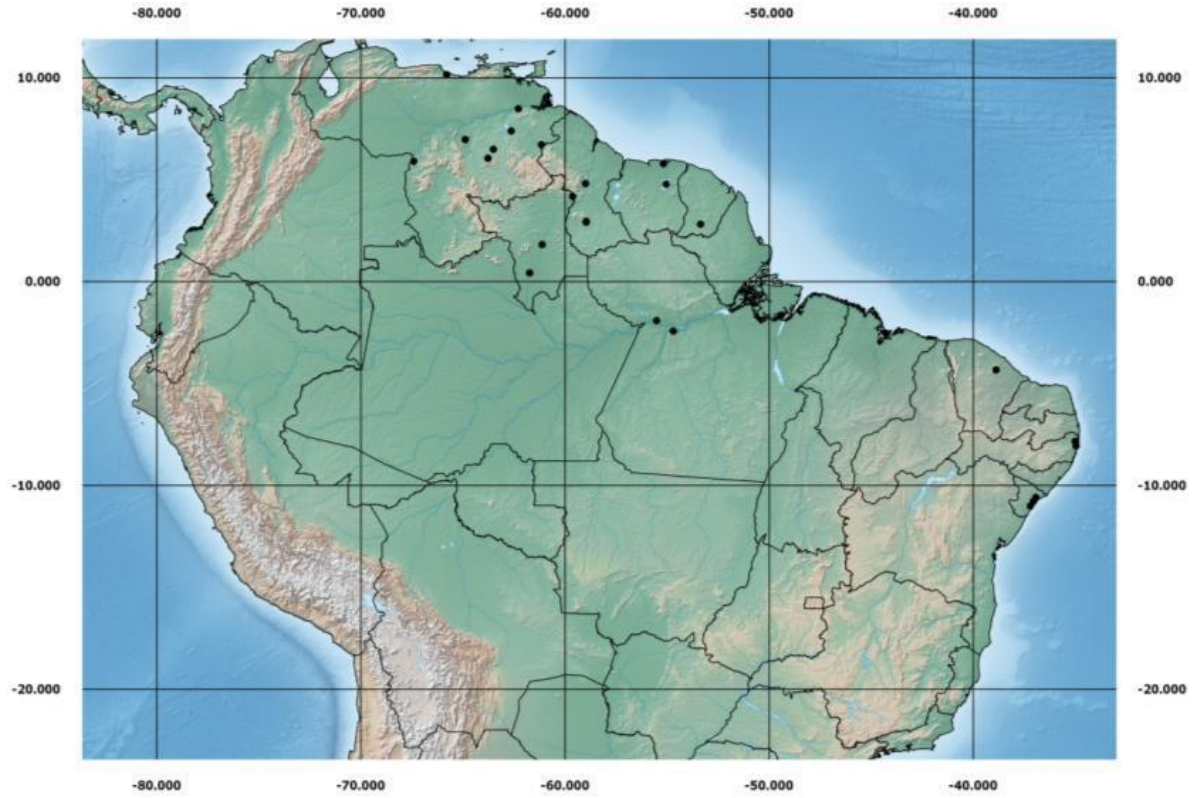

FIGURE 51. Distribution of *Miconia serialis*.

Illustration:—Wurdack (1993):245 (Fig. 24). Figures (52-53).

Habitat, distribution and ecology:—*Miconia serialis* occurs in Venezuela, Guyana, Suriname, French Guiana and Brazil (North and Northeast regions), where it is found in open vegetations around the Guiana Shield to northeastern Brazil.

Discussion:—*Miconia serialis* is the only species in albicans clade with decurrent leaves and suprabasal veins. It resembles *M. albicans* and *M. lourteigiana* because of its amorphous whitish indument that covers the adaxial surface of young leaves (easily loosened), the inflorescences with secund branches and the connective appendages with two ventral projections. It differs from both species by the sessile leaves, with suprabasal veins.

FIGURE 52. A-E. *Miconia serialis*. A. Fertile branch. B. Trunk. C. Adaxial surface of leaf. D. Leaves base. E. Abaxial surface of leaf.

FIGURE 53. A-G *Miconia serialis*. A. Fertile branch. B. Flower. C. Hypanthium in longitudinal section. D. Petal. E-F Stamens. G. Style.

16. *Miconia stenostachya* DC., Prodr. 3: 181 (1828). *Melastoma stenostachyum* Schrank & Mart. ex DC., Prodr. 3: 181 (1828), pro syn. *Acinodendron stenostachyum* (DC.) Kuntze, Revis. Gen. Pl. 2: 953 (1891). Type:—BRAZIL. Pará. Lectotype designated here: *Martius s.n.* (M! barcode M165661).

Miconia hypargyrea Miq., Linnaea 18: 622 (1844). Type:—SURINAME. Onoribo. Lectotype designated here: *unknown collector 978* (U-image! barcode U0004121).

Melastoma fastigiatum Mart. ex Triana, Trans. Linn. Soc. London 28: 116 (1871), *pro syn. Melastoma holosericeum* Steud. ex Triana, Trans. Linn. Soc. London 28: 116 (1871), pro syn.

Miconia cinerea Cogn. in Martius, Fl. bras. 14 (4): 290 pl. 60 (1887). Acinodendron cinereum (Cogn.) Kuntze, Revis. Gen. Pl. 2: 950 (1891). Type:—BRAZIL. Lectotype designated here: *Glaziou 11974* (BR!); isolectotypes: G! BR! (fragment, barcode 0000005191215), BR! (fragment, barcode 0000005190506) K!, P!, R -fide Goldenberg *et al.* (2013). Syn. nov.

Shrubs up to 4 m high; branches, petioles, abaxial surface of leaves and inflorescence densely covered by whitish amorphous hairs. Branches quadrangulars. Petioles (0.5)0.7–3.7 cm long. Blades 4.7–19.2 × 1.5–9 cm, oblong to lanceolate, apex acute to slightly acuminate, base rounded to acute, margin entire to slightly crenulate in the superior half, adaxial surface glabrous, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 4.7–14 × 2.2–8 cm, terminal, branches secund bifid subscorpioid, 1.1–4 cm long; bracts and bracteoles persistent. Flowers 5-merous. Hypanthium 2.1–3 mm long, campanulate, externally covered by whitish amorphous trichomes inner surface and torus glabrous. Calyx inner lobes triangular, persistent in fruit, inner surface glabrous, tube 0.4–0.6 mm long, outer lobes 0.8–0.9 mm long, apex with an inconspicuous tooth. Petals 1.5–4.1 × 1.2–1.5 mm, margins glandular-ciliate. Stamens white, dimorphic in size, filaments in the antesepalous stamens 4–4.2 mm long, in the antepetalous 2.8–3.2 mm long, both glabrous; connectives prolonged below the thecae 0.1–0.2 mm long in the antesepalous and ca. 0.2 mm long in the antepetalous, with two small, ventral lobules in both cycles; anthers 4.1–4.3 mm long in the antesepalous and 3.1–3.4 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined pore, 0.1–0.2 mm diam. Ovary 1.3–1.7 mm long, 1/2 adherent to the hypanthium, 3-locular, apex glabrous. Style 6.9–8 mm long, curve, sparsely glandular-

stipitate in the inferior half, stigma truncate. Fruits baccate, 3.4–6.7 mm diam., black when ripe, 29–77 seeds.

Additional specimens examined:—BELIZE. Belize District: "Butcher Burns Road", 27 May 1974, *Dwyer 12448* (NY). Toledo District: Cowpen, 30 Mar 1942, *Gentle 4013* (NY). **BOLIVIA.** "Apolo", 20 Aug 1972, *Ellenberger 1353* (P). "Valeé da Tipuani", 1851, *Weddell 1851* (P-P05315390, US). **Beni:** Ballivian, 8 Nov 1985, *Solomon 14625* (US), 1995, *Guareco 597* (RB). Yacuma, 4 Nov 1985, *Solomon 14557* (US), 30 Sep 1988, *Williams 713* (NY, US). **La Paz:** Abel Iturralde, 22 Sep 1984, *Haase 625* (US), 8 Nov 2006, *Maldonado 3479* (NY). Nor Yungas, 6 Sep 1894, *Bang 2416* (BR, G, US), Oct 1912, *Buchtien 3868* (US), 13 Nov 1982, *Solomon 8875* (US). **Santa Cruz:** Andres Ibañez, 15 Oct 1989, *Coimbra 817* (P). Chiquitos, 20 Jul 1983, *Daly 2146* (US), 17 Oct 1994, *Vargas 3295* (US). Ibañez, 25 Sep 1989, *Coimbra 755* (US). Ichilo, 1 Nov 1990, *Nee 39702* (NY, US), 11 Jul 2004, *Nee 52686* (NY). Nuflo de Chavez, 20 Nov 1994, *Guillén 2618* (US). Velasco, 1 Oct 1987, *Killeen 2744* (NY), *Killeen 5583* (RB), 21 Jun 1991, *Nee 41153* (US). 27 Aug 1993, *Guillén 947* (US), 23 Oct 1993, *Killeen 5911* (US). Yungas, s.d., *D'Orbigny 467* (P). **BRAZIL.** s.l., s.d., *Burchell 5324* (K, P), s.d., *Burchell 5421* (K), s.d., *Burchell 5477* (K), s.d., *Burchell 5492* (K), s.d., *Burchell 7904* (K), s.d., *Ferreira 1* (P), s.d., *Loefgren 870* (P), s.d., *Loefgren 1398* (P), s.d., *Sellow 181* (K), May 1821, *Riedel 1832* (K, P, US, W), 1840, *Sellow s.n.* (BR, G, K). "Bords du Rio Tocantins", Aug 1844, *Weddell 2467* (P). "Sertão d´Amaroleité", Sep 1844, *Weddell 2718* (P). **Amapá:** Calçoene, 12 Dec 1984, *Mori 17387* (K, MG, NY, US)."Coastal Region", 10 Jul 1962, *Pires 52071* (IAN, K, MG, NY). "Igarapé do Lago", 17 Oct 1980, *Rebelo 685* (MG). Tartarugalzinho, Nov 2005, *Neto 2029* (MG). **Amazonas:** s.l., 1827, *Martius 18* (K). Humaitá, 29 Sep 1975, *Ferreira 220* (INPA), 1 Sep 1980, *Janssen 543* (INPA, MG, RB), 22 Oct 1981, *Renner 499* (INPA, US). Iranduba, 28 Aug 1981, *Renner 338* (INPA). Manaus, 3 Dec 1943, *Ducke 1345* (IAN, NY, MG, RB, US), 30 Sep 1955, *Rodrigues s.n.,* (INPA2071), 3 Oct 1961, *Rodrigues 2566* (INPA, P). **Bahia:** s.l., s.d., *Blanchet 3322* (BR, G, G-DC, P, W). Cairu, 25 Jun 2000, *Juchum 15* (NY, RB). Caravelas, 19 Jun 1985, *Hatschbach 49513* (MG). Gameleira, 1 Sep 1997, *Pignal 670* (P). Ilhéus, 27 Nov 1983, *Carvalho 2061* (P). Itanagra, 30 Jan 2009, *Prates 215*. Itaparica, 10 Feb 2003, *Pignal 2039* (K). Jacobina, 1845, *Blanchet 3621* (BR, G, G-DC, K, NY, P, RB, US). "Nazaré", s.d., *Sellow 412* (US). Porto Seguro, 4 Jun 1962, *Duarte 6716* (NY, RB), 18 Oct 1973, *Euponino 331* (US), 21 Nov 1978, *Euponino 378* (NY), 12 Dec 1991, *Sant'Ana 106* (NY, RB), 17 Sep 2006, *Amorim 6310* (RB, UPCB). Rio de Contas, 19 Jan 1974, *Harley 15273* (NY, P, US), 26 Oct

1988, *Harley 25626* (NY, UEC), 28 Aug 1993, *Ganev 2136* (RB), 5 Jan 2004, *Santos 267* (RB). "Rodovia Itabuna-Ilhéus" 5 Apr 1965, *Belém 700* (IAN, RB, US). Santa Cruz de Cabrália, 6 Jul 1979, *Mori s.n.* (US-US2857036). **Ceará:** "Araripe", Nov 1838, *Gardner 1605* (G, G-DC, K, NY, P, US). **Distrito Federal:** Brasília, s.d., *Sellow s.n.* (G, P-P05315508), 8 Sep 1962, *Duarte 204* (NY,P), 6 May 1963, *Pires 9618* (US), 16 Aug 1963, *Maguire 56217* (NY, RB), 14 Sep 1964, *Irwin 5947* (NY, RB), Oct 1964, *Barroso 615* (RB), 23 Dec 1964, *Belém 70* (IAN, RB), 14 Sep 1965, *Irwin 8298* (IAN, NY), 30 Sep 1965, *Irwin 8823* (IAN, K, NY), 31 Aug 1982, *Kirkbride Jr. 4863* (INPA, NY), 16 Aug 1983, *Pereira 683* (INPA, NY), 14 Jun 2008, *Felizola 21* (INPA). Planaltina, 6 Sep 1992, *Melo 797* (K). "Prox. Fábrica de cimento Percal", 13 Out 1971, *Batista 18* (US). "Rio das Salinas", 22 Oct 1981, *Valle s.n.* (P-P05315532). **Goiás:** s.l., 1841, *Gardner 3166* (K), 1841, *Gardner 3168* (G, K, NY, P, W). Alto Paraíso de Goiás, 21 Oct 1965, *Irwin 9407* (IAN, NY, US), 28 Sep 1975, *Hatschbach 37270* (US), 25 Jan 1980, *King 8308* (US). 25 Oct 1997, *Marquete 2753* (RB). Brasilândia, 25 Oct 1960, *Delforge s.n.* (RB-RB108687). Caiapônia, 19 Oct 1964, *Irwin 7085* (K, NY, US), 22 Oct 1964, *Irwin 7192* (IAN, NY, RB), 2 May 1973, *Anderson 9621* (NY), 12 Oct 1998, *Gomes-Klein 3493* (NY, RB), 16 Nov 2007, *Silva 434* (UPCB). Caldas Novas, 11 Jul 1976, *Hatschbach 38801* (US), 28 Oct 1993, *Vieira 1765* (RB). Cocalzinho de Goiás, 21 Feb 2013, *Rocha 929* (NY). Corumbá de Goiás, 14 Oct 1956, *Smith s.n.* (US-US2248203), 18 Jan 1972, *Irwin 34522* (NY)."Estrada Alto Paraíso", 10 Oct 1979, *Heringer 2343* (NY). "Forquilha a Fornas", 31 Aug 1894, *Glaziou 21391* (BR, G, K, P). Goiânia, 20 Aug 1944, *Williams 8183* (NY, US). "Ilha do Bananal", 22 Sep 1980, *Ratter 4482* (US). Itarumã, 14 Nov 1996, *Ratter 7693* (K). "Iter Matogrossense", "1892", *Moore 420* (K, NY), "1892", *Moore 490* (NY). Jataí, 1 Aug 1956, *Macedo 4625 (*K, US). Luziânia, 11 Dec 1978, *Heringer 16111* (RB). Montes Claros de Goiás, 16 Oct 2007, *Silva 6459* (UPCB). Mossâmedes, 27 Oct 1997, *Gomes-Klein 3331* (NY). Pirenópolis, 06 Nov 2004, *Delprete 9110* (NY). "Ponzo de Barbatimão", 20 Sep 1898, *Glaziou 21390* (BR, G, NY,P). "Rio Areias", 2 Oct 1894, *Glaziou 21392* (BR, G, K, P). "Rio Uruhu", *Pohl 923* (NY). Rio Verde, 28 Oct 1950, *Macedo 2661* (RB, US). “Serra dos Pyreneos", Aug 1892 , *Ule 117* (P, RB). "Serra Dourada", 1969, *Rizzo 4381* (RB). **Maranhão:** Mirador, 12 Nov 2007, *Rodrigues 148* (UPCB). **Mato Grosso:** s.l., 6 Nov 1977, *Passos 1117* (RB), 4 Nov 1985, *Yamamoto s.n.* (UPCB38900). Água Boa, 9 Oct 1964, *Prance 59334* (K, NY, US). Barão de Melgaço, 17 Sep 2002, *Zaniolo 378* (UPCB). Barra do Garças, 9 Jun 1966, *Hunt 5879* (K, NY, P), 26 Aug 1968, *Eiten 8380* (US), 26 Aug 1968, *Eiten 8394* (K), 8 Sep 1968, *Eiten 8635* (NY, RB, UEC, US), 12 Oct 1968, *Eiten 9299*

(K). Barra dos Bugres, 2 Aug 1994, *Macedo 3821* (INPA). Chapada dos Guimarães, 15 Oct 1973, *Prance 19037* (NY, US), 14 Nov 1975, *Hatschbach 37553* (US). Cuiabá, Sep 1927, *Collenette 160* (K, NY, RB), 19 Sep 1979, *Macedo 1371* (INPA). "Expedition Base Camp", 2 Oct 1967, *Argent 6593* (K, NY, RB). Garapú, 1 Oct 1964, *Irwin 6535* (K, NY, RB, US)."Ilha do Bananal", 11 Oct 1985, *Pirani 1230* (INPA, NY, MG). Juruena, 10 Jul 1997, *Souza 18587* (RB). Matupá, 23 Nov 1976, *Cordeiro 1153* (NY, US). "Near expedition base camp", 17 Sep 1968, *Harley 10079* (K, NY, P, RB), 10 Oct 1968, *Harley 10605* (NY, RB), 14 Oct 1968, *Harley 10645* (K), 14 Oct 1968, *Harley 10656* (K, P, US), 14 Oct 1968, *Harley 10665* (P), 29 Oct 1968, *Harley 10888* (US). Nobres, 18 Sep 1985, *Ferreira 6102* (MG). Nova Brasilândia, 12 Oct 1997, *Souza 20798* (RB). Peixoto de Azevedo, 24 Apr 1997, *Souza 15479* (RB). "Rio Arinos", 26 Sep 1943, *Baldwin 3052* (US). "Rio Suia Missù", 24 Sep 1968, *Harley 10225* (P), 20 Nov 1968, *Harley 11149* (NY, P, RB). "Rodovia Cuiabá-Barra dos Bugres", 4 Nov 1984, *"Vegetal-Clonoroeste" 1032* (RB). Rondonópolis, 29 Sep 1963, *Maguire 56916* (K, NY). Santa Terezinha, 14 Oct 1985, *Thomas 4407* (INPA, NY). São Félix do Araguaia, 12 Oct 1968, *Sidney 1475* (US), 15 Sep 1984, *Coradin 7274* (RB). "Serra do Cachimbo", 21 Nov 1976, *Nascimento 532* (MG). Sinop, 22 Sep 1985, *Thomas 3969* (INPA, NY, US). Xavantina, 9 Jun 1966, *Irwin 16803* (IAN, NY, US), 14 Jun 1966, *Irwin 17121* (IAN, K, NY), 1 Sep 1967, *Ratter 568* (K, P), 8 Sep 1967, *Argent 6319* (K, NY, P, RB), Nov 1967, *Ramos 91* (K, NY, P, RB), 8 Sep 1968, *Argent 6532* (K, P, RB, US), 19 Sep 1968, *Eiten 8812* (K), 12 Nov 1968, *Harley 11036* (K, P, RB, US), 14 Nov 1968, *Harley 11066* (NY, P, RB, US), 14 Nov 1968, *Harley 11069* (K, NY, P, RB, US). Mato Grosso do Sul: Aquidauana, 16 Oct 1995, *Hatschbach 63409* (US). Bonito, 20 May 2002, *Hatschbach 73173* (G). Coxim, 19 Sep 1996, *Simon 12 (NY)*. Pedro Gomes, 19 May 1973,*Hatschbach 32089* (NY, US). Três Lagoas, 24 Jun 1993, *Caliente 667* (UEC), 27 Oct 1993, *Caliente 1300* (UEC). **Minas Gerais:** s.l., 1916-1921, *Saint-Hilaire 220* (P, US), s.d., *Glaziou 12698* (BR, G, K, NY, P), 1838, *Claussen 561* (P), 1838, *Claussen 563* (P, US). Baependi, 22 Sep 2002, *Ferreira 267* (UPCB), 1 Oct 2002, *Ferreira 300* (RB, UPCB). Barroso, 25 Sep 2001, *Assis 254* (UPCB), 20 Oct 2001, *Assis 322* (RB), 15 Dec 2001, *Assis 401* (UPCB). Belo Horizonte, 3 Sep 1932, *Mello Barreto 945* (RB), 3 Sep 1932, *Mello Barreto 953* (RB), 23 Sep 1942, *Magalhães 2393* (NY), 11 Sep 1945, *Williams 7530* (BR, K, NY, RB, US), 18 Sep 1945, *Williams 7575* (RB). Boa Esperança, 30 Jul 2006, *Silva 61* (UPCB). Buenópolis, 12 Oct 1988, *Harley 24912* (NY, UEC, US). Carandaí, 24 Oct 1956, *Duarte 3570* (RB). Cardeal Mota, Sep 1989, *Sobral 6238* (UPCB), 24 Sep 2002, *Kinoshita C-046* (UEC). Carrancas, 13 May 1989, *Van Den Berg B-32* (RB), 8 Jan

1997, *Matsumoto 581* (UEC). Catas Altas, 10 Oct 2000, *Ordones 466* (UPCB), 16 Dec 2000, *Ordones 654* (UPCB). Delfinópolis, 10 Sep 1999, *Godoy 1836* (RB). Diamantina, 8 Sep 1971, *Hatschbach 27483* (UPCB, US), 24 Oct 2008, *Nogueira s.n.* (UPCB42752). Jaboticatubas, 7 Jul 1972, *Hatschbach 30051* (NY, UPCB, US), 24 Oct 1974, *Hatschbach 35258* (US), 6 Sep 1976, *Menezes 7336* (UEC). Lagoa Santa, s.d., *Warming s.n.* (K-K000833226), 24 Nov 2004, *Almeda 8929* (UPCB). Mendanha, 29 Jun 2012, *Araújo 349* (RB). Paraopeba, 14 Jul 1954, *Heringer 3460* (NY). Piedade, s.d., *Damasio 1239* (RB). Rio Doce, 20 Jun 2003, *Neto 3498* (UPCB). Rio Pardo de Minas, 13 May 1998, *Pirani 4308* (UPCB). Rio Vermelho, 25 Aug 2008, *Mota 1349* (UPCB). Santa Luzia, 25 Oct 1945, *Assis 16* (RB). Sanatana do Pirapama, 20 Nov 2009, *Zappi 2449* (RB), 9 Mar 2010, *Zappi 2773* (RB). Santana do Riacho, 28 Nov 1981, *Silva 155* (RB). São Batista do Glória, 13 Nov 2011, *Costa 67* (UEC). São João Del Rei, 1816-1821, *Saint-Hilaire 1971* (P), 18 Apr 1988, *Krieger 25599* (RB). São Roque de Minas, 17 Jul 1995, *Romero 2530* (US), 29 Sep 1995, *Nakajima 1400* (NY, UEC), 30 Sep 1999, *Mello-Silva 1681* (NY, RB, UPCB), 25 Mar 2009, *Caddah 371* (NY, UPCB). "Serra de Catiara", 18 Aug 1950, *Duarte* (RB). "Serra de Lenheiro", 24 Jun 1887, *Glaziou 16903* (BR, G, K, P), 25 Apr 1957, *Pereira 3132* (RB). "Serrinha de Santa Bárbara", 6 May 1892, *Glaziou 19331* (BR, K, P). "Serra do Calyxto", Sep 1945, *Lanstyak s.n.* (RB-RB55994) . Três Marias, 7 Sep 1963, *Santos 24159* (NY). Uberlândia, 4 Sep 1992, *Araújo 272* (US). Várzea da Palma, 13 Mar 1999, *Hatschbach 69011* (G). **Pará:** s.l., 1912, *Luetzelburg 28* (RB). Altamira, 14 May 2001, *Loureiro 197* (RB), Dec 2005, *Sobral 10591* (UPCB), Dec 2005, *Sobral 10773* (UPCB). Conceição do Araguaia, 18 Aug 1955, *Macedo 4055* (US), 9 Sep 2001, *Melo 2840* (MG). Ilha do Marajó, 19 Dec 1901, *Guedes 2576* (RB), 1 Oct 1976, *Oliveira 6490* (MG), 9 Nov 1987, *Rabelo 3748* (INPA, NY, US). Itaituba, 28 Sep 1977, *Silva 2160* (INPA), 16 Nov 1978, *Silva 3769* (INPA, MG, US), 16 Nov 1978, *Silva 3772* (MG, NY). Muaná, 25 Oct 1970, *Oliveira 5330* (IAN). "Rio Mocoões", 9 Nov 1987, *Prance 30384* (NY). "Rio Parú de Oeste", 28 Feb 1970, *Cavalcante 2546* (MG, NY). Santarém, Nov 1849, *Spruce 10150* (G, K), 13 Dec 1978, *Maciel 330* (IAN, MG, NY), 15 Dec 1978, *Vilhena 311* (MG). São Miguel do Pracuúba, 18 Dec 1974, *Oliveira 6228* (MG), 9 Nov 1977, *Prance 25109* (K, INPA, MG, NY, RB). Trombetas, 7 Dec 1910, *Ducke 11368* (RB). **Paraná:** Arapoti, 12 Oct 1968, *Hatschbach 20029* (US). Jaguariaíva, 25 Sep 2009, *Marcílio 45* (UPCB). Sengés, 10 Oct 1958, *Hatschbach 5075* (US). **Piauí:** s.l., s.d., *Wullschlaegel 1458* (NY). Bertolínia, 4 Dec 1980, *Fernandes s.n.,* (UPCB-UPCB70968). **Rio de Janeiro:** "Baixada Fluminense", 5 Oct 1942, *Carcerelli 53* (RB). Itaboraí, 5 Aug 2010,

Uhlmann s.n. (RB-RB556014). Magé, 10 Feb 1868, *Glaziou 2868* (BR, P), Oct 1984, *Martinelli 10097* (RB), 30 Oct 1984, *Sonkin 384* (K, RB), 5 Sep 1987, *Barros 87* (RB), 4 Apr 2013, *Bandeira 203* (RB). Rio de Janeiro, 12 Aug 1946, *Brade s.n.* (RB-RB149533), 12 Jun 1980, *Lima s.n.* (RB-RB200009), 27 Oct 1980, *Baumgratz 205* (RB,US), 1991, *Armando 15* (RB), 16 Jan 1991, *Giordano 912* (RB). **Rondônia:** Cerejeiras, 12 Jul 1997, *Leite 1731* (MG). Porto Velho, 29 Mar 1995, *Miranda 564* (UPCB). Presidente Médici, 29 Sep 2013, *Goldenberg 1694* (RB). Vilhena, 2 Jan 1979, *Silva 4104* (MG), 23 May 1979, *Silva 4624* (MG), 10 Oct 1979, *Vieira 655* (MG), 7 Nov 1979, *Bruce 386* (MG), 22 May 1997, *Miranda 1515* (IAN, INPA), 22 May 1997, *"P.J.D" 1515* (MG). **Roraima:** Alto Alegre, "1976", *Edwards 2662* (K, NY, US), 17 Jun 1986, *Hopkins 798* (NY, US), 27 Feb 1987, *Ratter 5496* (INPA, NY). Boa Vista, 20 Nov 1978, *Souza 274* (INPA). Caracaraí, 12 Nov 2010, *Cangani 106* (INPA), 30 Jul 2011, *Zartman 8506* (NY), 19 Oct 2011, *Meirelles 760* (NY). Igarapé Água Boa, 22 Jan 1967, *Prance 4023* (K, MG, NY, RB, US). "Ilha de Maracá", 24 Mar 1987, *Ratter 5840* (INPA). "Serra da Lua", 12 Jan 1969, *Prance 9552* (BR, INPA, K, MG, NY). "Serra Tepequem", 25 Nov 1954, *Maguire 40045* (IAN, NY, W). **São Paulo:** s.l., 1836, *Humboldt s.n.* (US-US480610), Oct 1908, *Löfgren 149* (RB). Água Funda, 2 Sep 1941, *Hoehne s.n.* (K-K000833205). Águas de Santa Bárbara, 19 Dec 1995, *Souza 9636* (RB, UEC). Bataguaçú, 4 Sep 1979, *Oliveira 2* (UEC, US). Bauru, 24 Sep 1996, *Pinheiro 133* (RB), 23 Jul 1997, *Pinheiro 369* (RB, UEC). Campo Alegre, 24 Sep 1940, *Toledo s.n.* (K-K000833223). Fazenda Colonial, 14 Oct 1998, *Bicudo 120* (RB). Guarulhos, 21 Sep 1980, Forero 8138 (RB). Itapeva, 28 Aug 2008, *Cielo-Filho 784* (UPCB). Itararé, 22 Oct 1995, Cervi 5992 (UPCB). Itirapina, 13 Jul 1977, *Toledo 5537* (RB), 25 May 2010, *Caddah 784* (RB, UEC, UPCB). Matão, 15 May 1949, *Correa 368* (RB). Moji-Guaçu, 13 Sep 1955, *Handro 515* (US), 17 Dec 1959, *Eiten 1630* (NY), 20 Sep 1960, *Mattos 8224* (NY, US), 16 Sep 1977, *Sakane 606* (NY), 6 Aug 1980, *Mantovani 923* (K), 22 Sep 1980, *Forero 8209* (RB), 22 Sep 1980, *Forero 8228* (P, RB) , 24 Sep 1980, *Forero 8379* (NY, P), 17 Mar 1981, *Oliveira 29* (RB).Pirassununga, 13 Apr 1977, *Kirizawa 107* (NY). São Carlos, 7 Sep 1961, *Campos 39* (K, NY, US). São José dos Campos, 8 Jul 1961, *Eiten 3223* (US). Sorocaba, Feb 1834, *Riedel 2165* (BR, K, P). Tatuí, 14 Jun 1938, *Hoehne s.n.* (K-K000833220). Tocantins: Formoso do Araguaia, 14 Jul 1987, *Tsugaru B-220* (NY). Pindorama do Tocantins, 16 Oct 2008, *Oliveira 1372* (UPCB), 16 Oct 2008, *Oliveira 1383* (UPCB). "Rio Sono", 20 Nov 1998, *Ratter 8133* (K). **COLOMBIA.** s.l., 1760, *Mutis 1245* (US), s.d., *Triana 81* (P), (1851-1857) *Triana 434* (US), 17 Jan 1905, *Goudot s.n.* (P-P05315490, P05315491). "Mariquita", Nov

1842, *Linden 762* (P), Feb 1843, *Linden 1156* (G, P, W). "Rio Meta", 16 Oct 1938, *Cuatrecasa 3713* (US). **Antioquia:** s.l., 1851-1857, *Triana s.n.* (P-P05315461). Copacabana, 28 Apr 1934, *Daniel 276* (US). Ituango, 10 May 1988, *Zarucchi 6424* (US). Montebello, 25 May 1989, *Ciro 210* (NY, US). Santa Bárbara, 21 Sep 1922, *Pennell 10926* (US). Arauca, Cravo Norte, 20 Jan 1955, *Gómez 15* (US). **Bogotá:** La Mesa, 1851-1857, *Triana s.n.* (G-DC, P-P05315462), Nov 1854, *Triana 6258* (US). **Boyacá:** Rondon, 14 Mar 1939, *Haught 2673* (US). **Cundinamarca:** Melgar, 4 Dec 1917, *Pennell 2851* (US), 4 Dec 1917, *Pennell 2894* (US). Silvania, 20 May 1972, *Barclay 3442* (US). **Huila:** Neiva, 1 Aug 1917, *Rusby 1080* (US). **Magdalena:** Manaure, 17 Apr 1944, *Haught 4114* (US). **Meta:** Alto Menega, 11 Feb 1969, *Pinto 794* (INPA, P). "Caño de Quenane", 22 Feb 1941, *Dugand 2885* (US)."Caño Iracá", 20 Mar 1957, *Jaramillo 717* (US). Llanos de San Martín, 5 Mar 1967, *García-Barriga 18793* (US). Los Llanos, 10 Nov 1938, *Cuatrecasas 4566* (US). Orocue, 12 Apr 1939, *Haught 2762* (RB, US). Puerto Lópes, 27 Mar 1971, *Pinto 1592* (P). San Juan de Arama, 1 Apr 1971, *Pinto 1694* (P), 2 Apr 1971, *Pinto 1724* (P). Villavicencio, 17 Mar 1939, *Killip 34293* (US). Ocana: s.l., Oct 1850, *Schlim 140* (G, G-DC, P). **Santa Marta:** s.l., 1898-1901, *Smith 763* (G, P, US). **Santander:** Mesa de los Santos, 15 Dec 1926, *Killip 15028* (NY, US), 15 Dec 1926, *Killip 15081* (NY, US). Sierra Nevada: "Rio Hacho", Mar 1852, *Schlim790* (G, G-DC, P). **Tolima:** "Cordillera Central", 26 Jul 1950, *Smith 1271* (US). Mariquita, 22 Jul 1957, *Grubb 41* (US). "Near Piedras", 30 Oct 1938, *Haught 2404* (NY, US). Valle del Cauca, s.l., 5 Jun 1922, *Pennel 6319* (US). Cali, 20 Dec 1938, *Balls 5770* (US), 25 Dec 1959, *Cuatrecasas 25676* (US). Cerro de Las Cruces, 21 May 1944, *Killip 38396* (US). Jamundi, 25 Apr 1992, *Ramos 3626* (US). **Vaupés:** San José del Guaviare, 4 Nov 1939, *Cuatrecasas 7432* (US). **Vichada:** Cumaribo, 12 Dec 1993, *González 9087* (P). Saracuré,18 Jan 1944, *Hermann 10955* (US). **COSTA RICA.** "Interamerican Hwy": "General Valley", 25 Jan 1967, *Burger 4614* (NY). **GUATEMALA.** Izabal: "Near Quiriguá", 27 Apr 1939, *Standley 72381* (NY). "Vicinity of Quiriguá", 31 May 1922, *Standley 23893* (NY). **GUYANA.** s.l., 1841-1842, *Schomburgk 366* (G, P). "Roraima", 1842-1843, *Schomburgk 690* (P). s.l., 1841-1843, *Schomburgk 691* (P). **Cuyuni-Mazaruni:** "Mt. Ayanganna", 12 Mar 1987, *Pipoly 11163* (NY). **Potaro-Siparuni:** "Pakaraima Mts", 12 Jan 1993, *Henkel 692* (NY, US), 15 Jun 1994, *Henkel 5655* (US). **Rupununi:** Dadanawam, 18 Jan 1991, *Jansen-Jacobs 2131* (NY, US). Shea Village, 10 Feb 1994, *Jansen-Jacobs 3688* (P).**Upper Takutu-Upper Essequibo:** Nappi Village, 12 Feb 1993, *Hoffman 3718* (US). "Rupununi Savanna", 13 Nov 1993, *Henkel 3471a* (NY, US), 26 Apr 1994, *Henkel 3775* (US). **HONDURAS.** "All Pines", 10 Sep 1930,

Schipp 519 (G). **Gracias a Dios:** "Alrededores de Mocoron", 31 Jan 1984, *Torres 138* (NY). **MEXICO. Oaxaca:** Mixes, 10 Mar 1970, *MacDougall s.n.* (NY). "Monte Nyro Lalana", 6 May 1939, *Schultes 779* (NY). **NICARAGUA.**Comarca del Cabo: "Along creek, Bihmona", 7 Jul 1972, *Robbins 5678* (NY). **PANAMA. Canal Zone:** "Near Madden Wye", 8 May 1971, *Croat 14595* (NY), 7 Jul 1971, *Croat 15274* (NY). "Vicinity Summit", 14 May 1947, *Allen 4556* (G, NY). **PARAGUAY. Amambay:** "Cerro Corá", Oct 1980, *Casas 4025* (NY). Canindeyú: Aguara-ñu, 19 Feb 1998, *Marín 793* (G). "Inter Ypé-Jhú": Canendiyu, 12 Apr 1980, *Bernardi 20524* (NY). PERU. Ayacucho: Aina, 7 May 1929, *Killip 22705* (US). Junín: Kivinaki, 2 Dec 2005, *Daza 4032* (NY). Loreto: Oct 1902, *Ule 6458* (G). Madre de Dios: Tambopata, 05 Jun 1996, *Aguilar 815* (NY). **Pasco:** Oxampampa, 20 Aug 1966, *Chrostowski 66-33* (US), 24 Sep 1983, *Smith 5228* (NY, US). Puno: San Juan del Oro, 14 May 1966, *Ferreyra 16708* (US). **San Martin:** Lamas, 8 Sep 1937, *Belshaw 3383* (US). Zepelacio, Oct 1933, *Klug 3265* (G, US). SURINAME. s.l., 1842, *Hostmann 371* (G, P), 13 Dec 1924, Raben 6744 (NY). "Patricksavanna", 11 Nov 1933, *Lanjouw 1243* (RB). Sipaliwini, 10 Dec 1935, *Rombouts 376* (NY). **TRINIDAD AND TOBAGO. Trinidad:** s.l., s.d., *Perre s.n.* (P-P05315464, s.d., *s.c. 67* (US-US01100215), s.d., *s.c. 1130* (US-US01100216), 1877-1880, *Fendler 981* (P). Arima, 5 Jun 1961, *Snow 12* (US). Buenos Ayres, 9 May 1919, *Broadway s.n.* (P-P05315476, US-US01100212). Maracas Valley, 10 Apr 1920, *Britton 1625* (US). Pitch Lake, 12 Apr 1921, *Britton 2904* (US). "Road from Eastern main road to heights os guanapo", 26 Jun 1973, *Philcox 7278* (P). St. Aruis, 24 Jun 1926, *Broadway 6327* (US). St. George, 22 Jun 1903, *Johnston 116* (US), 27 Aug 1959, *Webster 9945* (US). Piarco Savanna, 27 Feb 1920, *Britton 64* (US), 18 Mar 1920, *Britton 696* (NY, US), 15 Jun 1920, *Broadway s.n.* (G, US-US01100214). **VENEZUELA.** Guamytas, 3 May 1938, *Williams 10060* (US). La Ceiba, 19 Mar 1940, *Williams 12659* (US). "Rio Santa Barbara", 13 May 1926, *Christ 19* (US). **Amazonas:** Atures, 24 Apr 1989, *Romero 2012* (NY). Campamento Yutajé, 17 Jun 1996, *Michelangeli 332* (US). Santa Barbara, 21 Feb 1951, *Cowan 31956* (US). Sierra Parima, 18 Apr 1973, *Steyermark 106970* (US). **Anzoátegui:** Bolívar, 24 Nov 1981, *Davidse 19346* (US). **Atabapo:** La Esmeralda, 20 Dec 1993, *Coomes 304* (US). **Atures:** Puerto Ayacucho, 13 Apr 1978, *Davidse 14948* (US). **Barinas:** Los Conejos, 29 Mar 1977, *Berti 28-3-77* (G, US). **Bolívar:** Cedeño, Feb 1988, *Velazco 116* (NY). El Tigre, 16 Jun 1940, Williams 13337 (US). "Hato La Vergareña", 3 Apr 1955, *Wurdack 267* (P, RB, US). "Karaurin Tepui", 26 Apr 1988, *Liesner 23849* (US). Maripa, 21 Apr 1939, *Williams 11928* (US). "Mount Roraima District", Dec 1938, *Pinkus 59* (G, US)."Parguesa", 12 Apr 1946,

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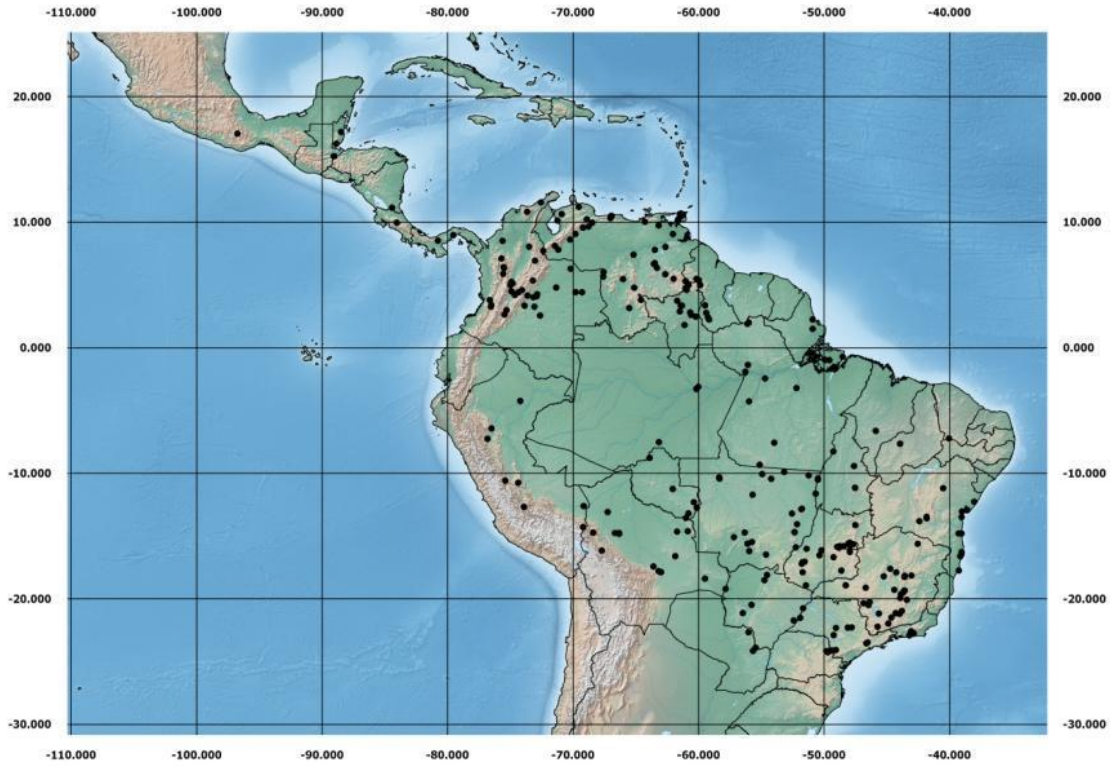

FIGURE 54. Distribution of *Miconia stenostachya*.

Illustration:—Berry *et al.* (2001): 463 (Fig. 382). Cogniaux (1887): plate 60 (as *M. cinerea*). Figure 55.

Habitat, distribution and ecology:—*Miconia stenostachya* is widely distributed and occurs in cerrado, savanna, campinas and open areas in the Atlantic Forest biome of coastal Brazil.

Discussion:—*Miconia stenostachya* resembles *M. fallax* and distinguishing these species *in sicco* needs further studied. Both occur in the same vegetations and are small shrubs with thyrses with subscorpioid branches and glandular-ciliate petals. In the field, it is possible to find them in the same general area (e.g., Brazil: Roraima, Minas Gerais and São Paulo) and they can be distinguished from each other. While *M. stenostachya* possess petioles 0.7–3.7 cm long, *M. fallax* has sessile to very short-petiolate leaves (≤0.5 cm long). In addition, *M. fallax* has thicker leaves and rounder petals (*vs.* oblong in *M. stenostachya*). For both species, several samples from different parts of their geographic distributions were included in a phylogenetic study (Chapter 1). The results showed that the samples of each species formed close but separate clades with distinct evolutionary histories. *Miconia cinerea* could only be distinguished from *M. stenostachya* by its leaves with a cordate base and crenulate margins; however, this feature also occurs in individuals *M. stenostachya* and should not be used to separate the two taxa. *Miconia cinerea* was previously known only from the type but was recently collected on the coast of Rio de Janeiro (type locality). This sample was included in the phylogeny of the group and was placed with the other samples of *M. stenostachya*. Based on this, and taking into account the overlapping geographic distribution of the two taxa, *M. cinerea* is considered in this work to be a synonym of *M. stenostachya*.

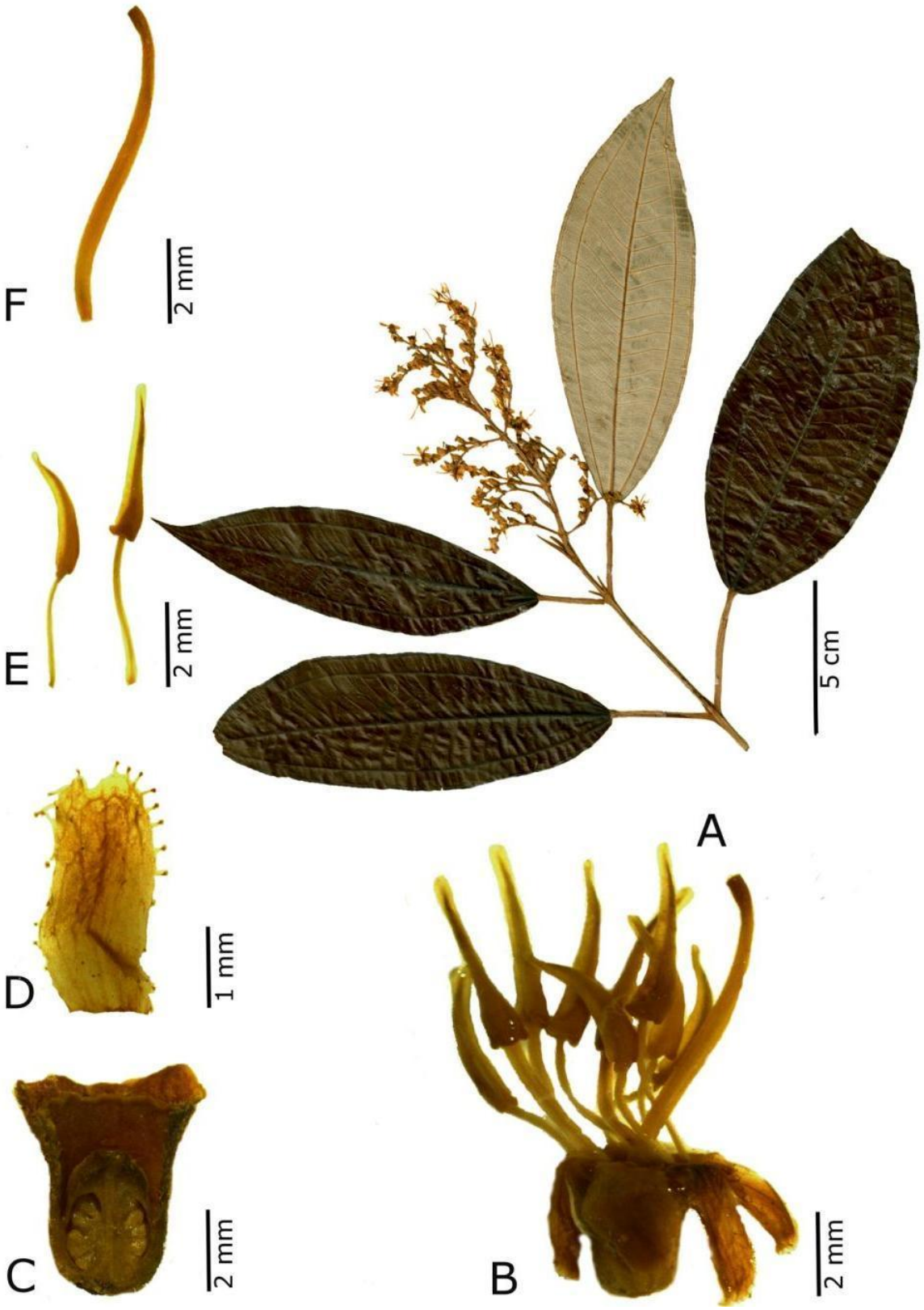

FIGURE 55. A-G: *Miconia stenostachya*. A. Fertile branch. B. Flower. C. Hypanthium in longitudinal section with ovary. D. Petal. E. Stamens. F. Style.

17. ***Miconia suberosa*** Meirelles & R. Goldenb., Phytotaxa 173: (4): 278-284 (2014). Type:—BRAZIL. Amazonas. Holotype: *J. Meirelles & D. Silva, 795* (INPA!); isotypes: UPCB!, NY!, UEC!, MG!.

Treelets up to 6 m high. Branches, petioles and inflorescence densely covered by dendritic hairs with short arms. Branches quadrangulars to rounded. Petioles 1.5–7 cm long. Blades 24.5–47.5 × 8–19 cm, oblong, apex acuminate, base rounded to obtuse, margin ciliate, adaxial surface glabrous except the central vein covered by dendritic ferrugineous trichomes, abaxial surface densely covered by stellate trichomes, longitudinal nerves 3, with an additional faint, marginal pair, basal to shortly suprabasal (inner pair up to 8 mm distant from the base). Panicles 10–37 × 1.8-12.7 cm, terminal, branches in a helicoid cyme, 0.5–1 cm long; bracts and bracteoles deciduous. Flowers 5-merous. Hypanthium 1.5–1.7 mm long, campanulate, externally covered by whitish stellate trichomes inner surface and torus glabrous. Calyx inner lobes truncate, persistent in fruit, inner surface glabrous, tube ca. 0.7 mm long, outer lobes 0.2–0.4 mm long, apex with a tooth. Petals 2.1–2.5 × 0.7–1.2 mm, margins glabrous. Stamens white, slightly dimorphic in size, filaments in the antesepalous stamens 3.1–3.7 mm long, in the antepetalous 2.5–2.9 mm long, both glabrous; connectives prolonged below the thecae 0.2 mm long in both cycles, with skirt-like appendages, ventrally slightly bilobed in the antesepalous and without a skirt-like appendage, bearing only a dorsal small spur in the antepetalous; anthers 1.5–1.6 mm long in the antesepalous and 1–1.1 mm long in the antepetalous, oblong, with a single terminal, ventrally inclined pore, ca. 0.1 mm diam. Ovary 1–1.2 mm long, 2/3 adherent to the hypanthium, 3-locular, apex glabrous. Style 3.5–7 mm long, straight, glabrous, stigma truncate. Fruits baccate, 5.6–6 mm diam., black when ripe, 5–8 seeds.

Additional specimens examined:—BRAZIL. Amazonas: "Estrada Manaus Porto Velho", 17 Jul 1972, *Silva 796* (INPA). "BR-319 ca. Km 235", 24 Nov 1973, *Lleras P19674* (INPA). Borba, 26 Oct 2011, *Meirelles 784* (INPA, NY, UEC, UPCB).

FIGURE 56. Distribution of *Miconia suberosa*.

Illustration:—Figures (57-58) extracted from Meirelles & Goldenberg (2014).

Habitat, distribution and ecology:—*Miconia suberosa* is endemic to black water river margins in the Brazilian Amazon.

Discussion:—*Miconia suberosa* is the only species in albicans clade with long trichomes that cover the inflorescences and leaves, which are ferrugineous and dentritic with short arms on the young branches.

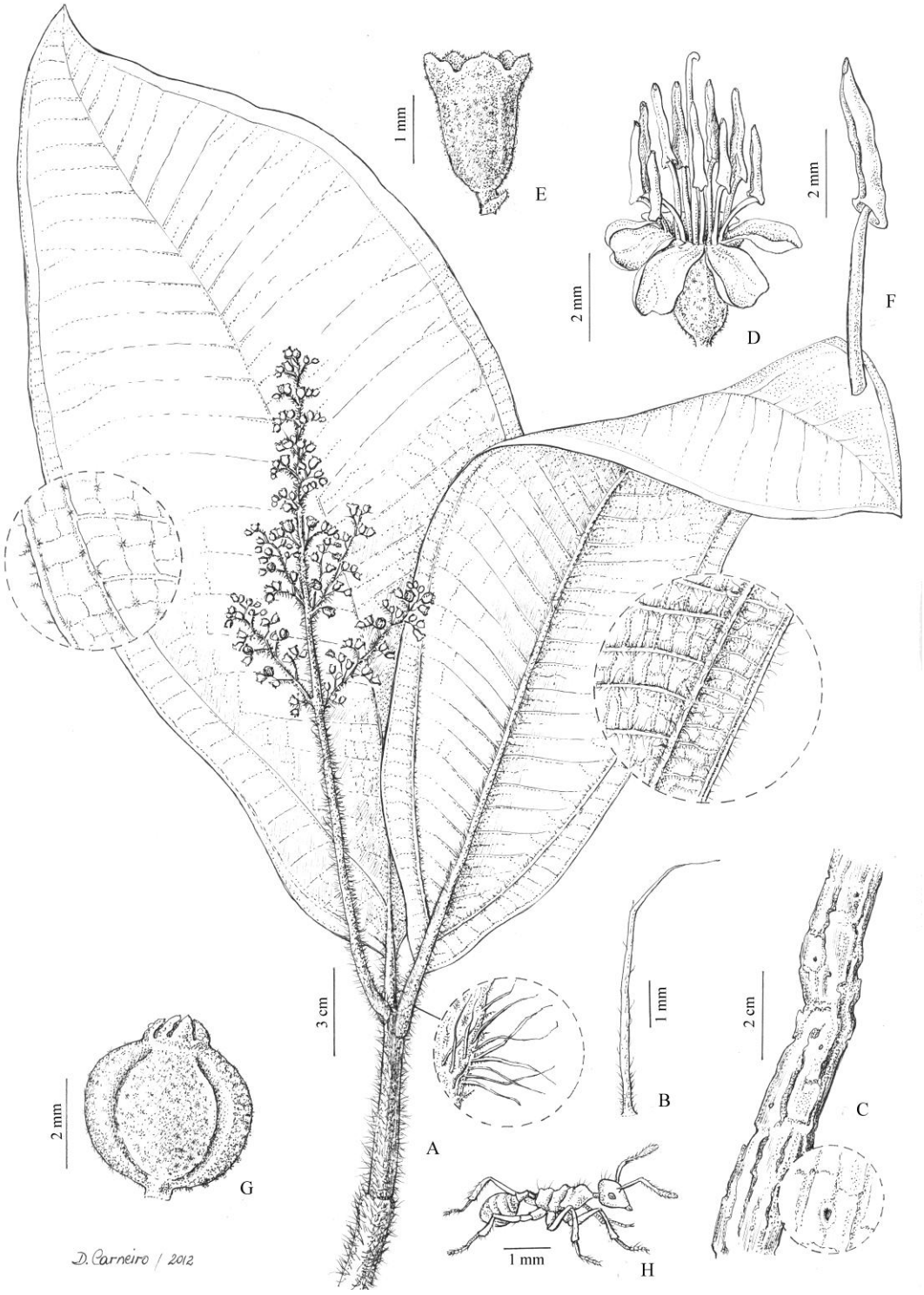

FIGURE 57. A-H. *Miconia suberosa* (from holotype). A. Fertile branch. B. Detail of dendritic trichome. C. Branche. D. Flower. E. Hypanthium. F. Stamen. G. Fruit. H. *Pheidole* ant. Extracted from Meirelles & Goldenberg (2014).

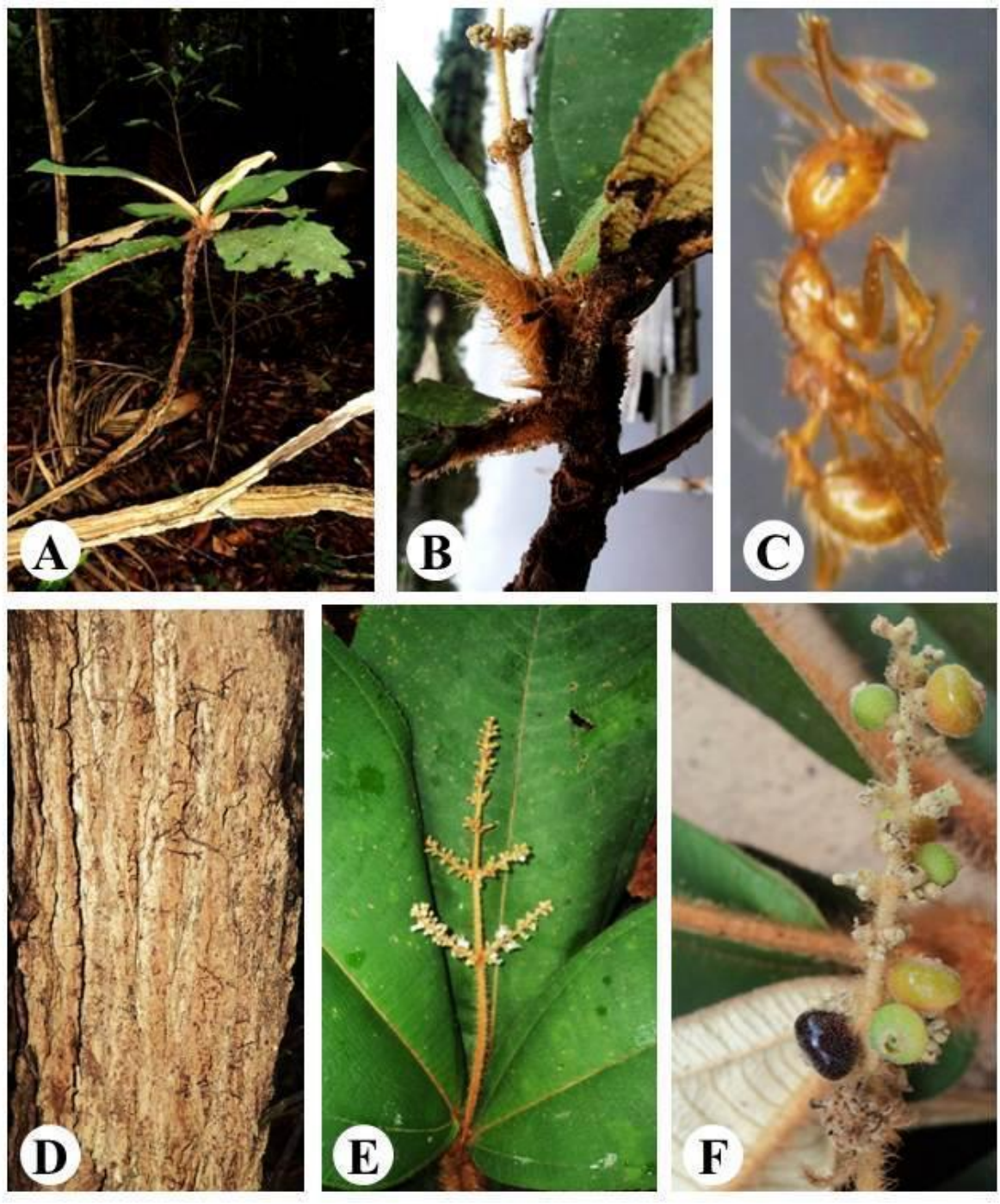

FIGURE 58. A-F: *Miconia suberosa*. A. Branch. B. Organic debris in braches and leaf base. C. *Pheidole* ant. D. Trunk. E. Inflorescence. F. Ripe fruits Black and immature from green to Orange. Extracted from Meirelles & Goldenberg (2014).

18. Miconia weddellii Naudin, Ann. Sci. Nat., Bot., Ser. 3 16:144 (1850). *Acinodendron weddellii* (Naudin) Kuntze, Gen. Pl. 2: 953 (1891). Type:—BRAZIL. "Between Goiás and Cuiabá". Holotype: *Weddell 3001*(P!); isolectotype: BR!

Small shrub up to 2 m high; branches, petioles, abaxial surface of leaves and inflorescence densely covered by whitish stellulate hairs. Branches rounded. Petioles 0.3–0.8 cm long. Blade 2.6–5 × 1.7–2.5 cm, oblong, apex acute, base rounded to cordulate, margin entire, adaxial surface glabrous, longitudinal nerves 3, with an additional faint, marginal pair, basal. Thyrses 4–8 × 1–2 cm, terminal, branches dichasial, 0.5 cm long; bracts and bracteoles deciduous. Flowers 5-merous. Hypanthium 1.7–1.8 mm long, campanulate, externally covered, torus with the same indument. Calyx inner lobes triangulars, persistent in fruit, inner surface glabrous, tube 0.1–0.2 mm long, outer lobes 0.6–0.7 mm long, apex with a tooth. Petals 2.2–2.9 × 1.2–1.3 mm, margins glandular-ciliate. Stamens 10, dimorphic, filaments in the antesepalous stamens 3.3–3.6 mm long, in the antepetalous 2.2–2.6 mm long, both glabrous; connectives prolonged below the thecae ca. 0.8 mm long in the antesepalous and ca. 0.4 mm long in the antepetalous, ventrally bilobed with a dorsal rounded projection in the antesepalous, and a cordiform skirt-like appendage in the antepetalous with a dorsal acute calcar; anthers 2.6–2.8 mm long in the antesepalous and 2.2–2.4 mm long in the antepetalous, yellow, oblong, with a single terminal, ventrally inclined pore, ca. 0.1 mm diam. Ovary 1.3–1.4 mm long, 2/3 adherent to the hypanthium, 3-locular, apex moderately covered by glandular trichomes. Style 5.6–6.7 mm long, curve, stigma punctiform, the inferior half sparsely covered by glandular stipitate trichomes. Fruits baccate, 3–4.5 mm diam., color unknown when ripe, ca. 20 seeds.

Additional specimen examined:—BRAZIL. Mato Grosso. Ribeirãozinho.8 Nov 2000, *Sousa-Silva 146* (MO).

FIGURE 59. Distribution of *Miconia weddellii*.

Illustration: —Figure 60.

Habitat, distribution and ecology:—*Miconia weddellii* is a rare or poorly collected species, known only from the type and one recent collection from the year 2000 (more than one century after its publication). This could be related to its restricted distribution (the most restricted among the species in the albicans clade). It is endemic to rocky cerrado on the border Mato Grosso State and Goiás State, Brazil.

Discussion:—*Miconia weddellii* is a small shrub with thyrses, which have subscorpioid branches, and glandular-ciliolate petals margins (as found in *M. fallax*, *M. macuxi*, and *M. stenostachya*). It differs from these species by its shorter and narrower leaves and inflorescences, and more importantly by its stamens with skirt-like connective appendages that have a dorsal round projection in the antesepalous stamens and acute projection in the antepetalous stamens.

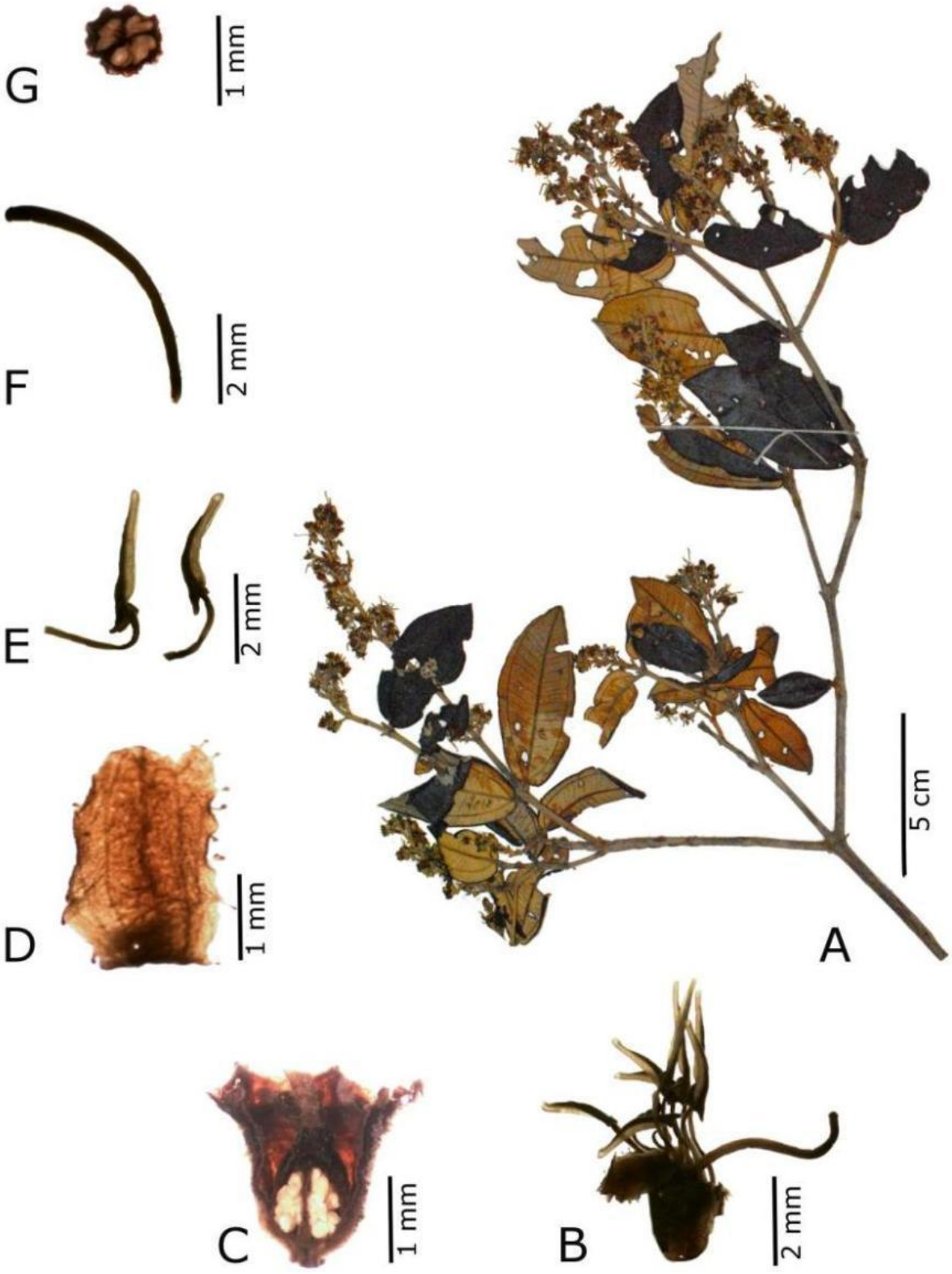

FIGURE 60. A-G: *Miconia weddellii*. A. Fertile branch. B. Flower. C. Hypanthium in longitudinal section with ovary. D. Petal. E. Stamens. F. Style. G. Ovary in transversal section. A-G: *Sousa-Silva 146* (MO)

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CONSIDERAÇÕES FINAIS

No estudo da família Melastomataceae, diversos estudos vem sendo desenvolvidos no intuito de aprimorar o conhecimento do grupo e a taxonomia utilizada para delimitar tribos, gêneros e espécies. O gênero *Miconia*, por não constituir um grupo natural de espécies, vem sendo estudado por diversos pesquisadores, que por meio de sequências de DNA e morfologia há cerca de dez anos na busca por grupos monofiléticos.

Esse trabalho, dando continuidade aos estudos moleculares no gênero *Miconia*, teve início com o estudo de um clado de plantas com folhas discolores e inflorescências de ramos escorpioides, cuja maioria das espécies pertencia à seção *Miconia*, subseção *Seriatiflorae*. Diversas expedições de coleta foram conduzidas em áreas da Amazônia brasileira para obtenção de material de mais de 70% das espécies incluídas na subseção para estudos moleculares e morfológicos. Diferentes tipos de análises filogenéticas foram realizadas com as sequências de pares de bases de seis diferentes regiões do DNA estudado. Todas as análises apontaram com altos valores de sustentação a não monofilia da subseção *Seriatiflorae*, corroborando com trabalhos prévios e com a necessidade urgente de revisão taxonômica do gênero como um todo. Maiores estudos sobre as pressões seletivas atuantes nesse grupo de plantas incluído na Tribo Miconieae são necessários para maior compreensão da evolução do grupo. Apomixia, poliploidia e hibridização constituem fatores importantes no processo de especiação.

A reconstrução de caracteres morfológicos demonstrou que os tricomas aracnoideos são uma possível sinapomorfia do clado albicans. As imagens de microscopia de varredura obtidas nesse trabalho possibilitaram a comparação detalhada dos tricomas de espécies do grupo de Seriatiflorae com dezenas de outras espécies relacionadas. Ficou muito evidente que os diferentes tipos de tricomas da face abaxial da folha das espécies são mais informativos no reconhecimento de grupos monofiléticos que o tipo de ramificação de inflorescências.

As novas espécies encontradas no decorrer do trabalho e o baixo número de sinonímias demonstram o quão pouco conhecida é a flora Amazônica, da qual fazem parte as espécies do clado albicans revisadas taxonomicamente nesse trabalho. É preciso maior investimento de recursos financeiros e humanos para o estudo de coleções e para a realização de mais coletas na região Amazônica.

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Declaro para os devidos fins que o conteúdo de minha dissertação de Mestrado/tese de Doutorado intitulada "Filogenia de Miconia seção Miconia subseção Seriatiflorae e revisão taxonômica do clado albicans (Melastomataceae, Miconieae)":

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