### Myristicaceae novelties from Ecuador

Tatiana S. Jaramillo, Priscilla Muriel, William A. Rodrigues and Henrik Balslev

Jaramillo, T. S., Muriel, P., Rodrigues, W. A. & Balslev, H. 2000. Myristicaceae novelties from Ecuador. – Nord. J. Bot. 20: 443-447. Copenhagen ISSN 0107-055X.

Virola aequatorialis is described as a new species from the coastal plain of Ecuador; it differs from the southeast Brazilian V. gardneri in several characters including its prominently reticulate leaves and the anthers which are obtuse and slightly shorter than the filament column. Osteophloeum platyspermum var. sulcatum and Otoba glycycarpa are proposed as new combinations.

T. S. Jaramillo and P. Muriel, Herbario QCA, Departamento de Biología. Pontificia Universidad Católica del Ecuador, P.O.Box 17-01-2184, Quito, Ecuador. – W. A. Rodrigues, Universidade Federal do Paraná/SCB, Pós-Graduaçao em Botanica/ Centro Politécnico, Jardim das Americas, Cx. P.19031, CEP 81531-970, Curitiba-Paraná, Brasil. – H. Balslev, Department of Systematic Botany, University of Aarhus, Nordlandsvej 68, DK-8240 Risskov, Denmark.

#### Introduction

In America, Myristicaceae comprise six genera and about 73 species (Smith 1937), and in many wet neotropical forests it is abundant and sometimes represented by many species, even in small areas (Gentry 1986, Balslev et al. 1987). We studied herbarium material of Ecuadorean Myristicaceae deposited in AAU, BM, C, GB, K, MO, NY, P, QCA, QCNE, S, and US and we found five genera and 36 species represented in that country. Among these, one species was undescribed and two new combinations were necessary.

## Virola aequatorialis Muriel & Balslev, sp. nov.

Species *Virola gardneri* affinis a qua differt foliis venatione prominente reticulato specialiter supra, antheris obtusis carnosis columnam filamentorum aequantibus vel parum brevioribus.

Type: Ecuador, Esmeraldas, Anchayacu, Eloy Alfaro, Mayronga, 100–250 m, Pennington et al. 14498, staminate (holotype K!; isotypes K!, NY!).

Tree to 45 m tall; bark with vertical grooves; latex red or transparent, watery; branchlets ca 5 mm thick, terete, glabrescent except for remains of caducous, felt-like, hyaline, short, dendritic-stellate hairs ca 0.1 mm diameter with a red centre. Young buds and folded immature leaves densely pubescent; mature leaves with petiole  $6-14 \times 1-3$  mm, winged, slightly canaliculate, terete, pubescent above and more so below; lamina 11- $29 \times 5-10$  cm, thin coriaceous, elliptic to narrowly elliptic-oblong (or ovate), base obtuse to acute (to shortly attenuate), apex cuspidate to acuminate, margin flat to slightly undulated; lamina above somewhat shiny, reticulate, glabrescent except at base and over the primary vein with remains of hairs similar to those on the branchlets; leaf lower surface glabrous in appearance but with scattered, hyaline, short dendriticstellate hairs 0.1 mm diameter, denser over the veins; primary vein prominent above and more so below; secondary veins 14-30 per side, parallel, not regularly

Accepted 2-5-2000

Nord. J. Bot. 20(4) 2000



opposite, ascendent, curved and anastomosing near the margin, prominule above and more so below; tertiary veins dense, salient above and below, veinlets evidently reticulate above and below. Staminate inflorescence axillary, paniculate, compound, composed of condensed racemes of ca. 5 flowers per cluster on a 1.2-2 mm broad flattened torus, the entire inflorescence 3-5 cm long, lax, with up to 70 flowers with similar indument as on the branchlets, but smaller and denser over the flowers, rachis soon glabrescent; peduncle 0.5-1 cm; bracts  $3.5 \times 2.3$  mm, deltoid, apex cuspidate, membranous, with an evident central vein, carinate, pubescent, early caducous, often shed leaving a scar remaining at the base of the torus. Pistillate inflorescence not seen. Staminate flowers pubescent, perianth glabrescent inside except for occasional longitudinal rows of minute dendritic-stellate hairs; pedicels 0.3-1.5 mm long; perianth thin, fleshy, 1.4-2.3 mm long, 3-lobed; lobes 0.6-1.5 mm long, with an evident central vein; androecium composed of 3 stamens, 1-1.4 mm long, column slender, 0.5-0.8 mm long, ca 0.2 mm wide at the base, anthers 0.5-0.7 mm long and ca 0.5 mm wide, subequal or slightly shorter than the filament column, almost completely fused, connectives slightly produced beyond the anthers. Pistillate flowers not seen. Infructescence with 1-2fruits, 3-6 cm long, peduncle 1-2.5 cm, with the same pubescence as the branchlets but hairs early caducous; pedicels ca 5 mm, fruits ca  $2.5 \times 1.5$  cm, obovoid to ellipsoid, base truncate to acute, apex obtuse with the stigma persistent, ± rugose, with remains of minute hyaline sessile-stellate hairs; pericarp thick coriaceous on immature fruits, woody at maturity, 2 mm thick; aril yellow-red (immature) laciniate in upper 1/3 (not seen in mature fruits); seed ovoid, testa dark brown, coriaceous, endosperm ruminate.

Additional specimens studied: Esmeraldas: Montalvo, La Mayronga, Pennington et al. 13736 (fruits K, MO, NY). Anchayacu, Eloy Alfaro, Mayronga, 100–250 m, Pennington et al. 14227 (K), 14343 (K), 14442 (K), 14924 (fruits K, NY). Businga en Río Verde, 30 km south of outlet of Río Verde into the Pacific Ocean, Little & Dixon 21186 (MO, US). Los Ríos: Vinces, Jauneche, km 70 Quevedo-Palenque road, vía Mocachi, 70–100 m, Dodson et al. 7477 (MO), Dodson et al. 8761 (MO), Dodson & Gentry 10107 (MO).

This species is characterised by leaves with a strongly winged petiole and a conspicuously reticulate surface of the blades. The leaves appear glabrous but have scattered dendritic-stellate hairs that become sessilestellate at maturity when they lose some of their upper branches (visible at  $40 \times$  magnification). The pubescence and the conspicuously winged petiole, suggest a close relationship to Virola gardneri (A. DC.)Warb. In V. aequatorialis the synandrium is obtuse, fleshy, subequal or slightly shorter than the slender filament column, while in V. gardneri, the anthers are narrowly oblong and slightly longer than the filament column. Further, V. gardneri is found in SE Brazil (Rodrigues 1980; Smith 1937), while V. aequatorialis is only known from the coastal plain in Ecuador. In the vegetative parts and the shape of the staminate inflorescence V. aeguatorialis is somewhat similar to Bicuiba oleifera (Schott) W. J. de Wilde. However, the inflorescence of V. aequatorialis, like in other species of Virola, is single-type panicle-like, whereas Bicuiba has a plural-type spike-like inflorescence (de Wilde 1991). The fruit of Bicuiba has the aril divided only for 1/3 of its length whereas Virola has the aril divided for more than 1/3 of its length. Unfortunately the material of V. aequatorialis described here does not have mature fruits with well developed arils, so our description of this important character is incomplete and based only on immature fruits.

#### Osteophloeum platyspermum (A. DC.) Warb. var. sulcatum (Little) T. S. Jaramillo & Balslev, comb. et stat. nov.

Basionym: Osteophloeum sulcatum Little, Phytologia 18: 404 (1969).

Type: Ecuador, Esmeraldas, San Lorenzo, Panadero, 40 m, Apr. 1966, Dixon 272, staminate (holotype US!; isotype NY!).

Vernacular names: chalviande, chalviande colorado, cuangaro (Spanish), chu-aïn-chi (Cayapa). Uses: Valuable for timber.

Representative specimens: Esmeraldas: Ricaurte, Reserva Indígena Awá, 300 m, Tipaz et al. 2043 (MO, QCNE). Tobar Donoso, 225 m, Játiva 21321 (QCNE); junct. of Río San Juan and Río Camumbi, 260 m, Játiva & Epling 1141 (MO, NY, US). Reserva Ecológica Cotacachi-Cayapas, 200 m, Tirado et al. 466 (MO, NY, QCNE). Cantón San Lorenzo, Reserva Étnica Awá,

Fig. 1. Virola aequatorialis. A. Staminate flowering branch. B. Detail of leaf lower surface. C-E. Staminate flower: C. Staminate flower; D. Staminate flower longitudinal section, showing the position of the androecium; E. Androecium. (A-E,Pennington et al. 14498, K holotype). F. Open fruit valves. G. Seed. (F-G,Pennington et al. 13736, K paratype). Drawn from dried material.

Centro Guadualito, 80 m, Aulestia et al. 236 (MO, NY, QCNE); San Lorenzo, near railroad 3 km SE, 10 m, Little 6295 (US). Virgen, Panadero, Little & Dixon 21272 (QCNE), Little & Dixon 21150 (NY, US). Río Bolborde, 300 m, Kvist et al. 48290 (AAU). Mataje: Játiva 21334 (QCNE), Játiva 334 (NY, US), Játiva & Epling 1159 (NY, US). Río Palabí, 100 m, Janse 287 (NY, US).

In the few existing studies of Osteophloeum it has always been treated as a monotypic genus until Little (1969) published O. sulcatum. He described this as a new species because of the larger, narrowly oblong leaves with cuspidate apex. Later, Rodrigues (in an unpublished manuscript dated 1995 treating Myristicaceae for Steyermark's Flora of the Venezuelan Guayana) cited this name as a synonym of O. platyspermum. We agree that it represents the same species because even when they are vegetatively different, both have similar androecium characteristics. Unfortunately, the lack of pistillate flowers in O. platyspermum var. platyspermum does not permit comparisons of the gynoeceum. It is a peculiar fact that all 100 collections seen for this paper are staminate, sterile or fruiting and that we have not found any specimens with pistillate flowers. We think O. sulcatum is better treated as a variety of O. platyspermum because it is geographically isolated and the vegetative features are markedly different (lamina 15-26 cm long and acuminate to cuspidate apex). Osteophloeum platyspermum var. sulcatum occurs along the Pacific Coast of Colombia and Ecuador, in the Chocó area at 0-300 m altitude whereas the typical variety, var. platyspermum, is widespread from Panama to Bolivia, but in Ecuador it occurs only along the eastern slopes of the Andean at 200-1000 m altitude.

# Otoba glycycarpa (Ducke) W. A. Rodrigues & T. S. Jaramillo, comb. nov.

Basionym: Virola glycycarpa Ducke, Notizbl. Bol. Tecn. Inst. Agron. Norte 4: 9 (1945).

Type: Brazil, Amazonas, Esperança, mouth of Rio Javary, "ad ostium fluminis Javary", Apr. 1944, Ducke 1508, fruits (holotype US!; isotypes F n.v. (seen on photocopy), GH n.v. (Gray Herbarium website), NY!).

Vernacular names: puca huapa (Quichua), bella maría (Spanish), eyepehue, guequihua, eyepenhueca, meñihue, eyerohue, tsempu (Huaorani).

*Uses*: The bark and latex is applied to the skin to treat mite or fungal infections and the fruits are eaten by toucans and parrots.

Representative specimens: Napo: Cantón Orellana, Sector Huashito, 250 m, Rubio 291 (AAU, GB, K, MO, NY, QCNE). Pastaza: Auca road, 115 km S of Coca, 320 m, Hurtado et al. 1319 (AAU, GB, K, MO, NY, QCNE). Morona-Santiago: Taisha, 500 m, Cazalet & Pennington 7583 (K, NY, US). Zamora-Chinchipe: Quebrada de los Monos, near Sabanilla, 1600 m, Little et al. 220 (NY, QCNE).

Ducke (1945), referring to the abaxial leaf surface, noted: "...tomento microscopio cupreo pilulis stellatis parvis sericeonitentibus consperso induta, hoc tomento in vetustis canescente (injunioribus et adultis recentioribus)...". However, the hairs of the type specimen are not stellate but overlapping, 2-branched and they resemble only superficially the dendritic hairs which are common in *Virola*, easy to observe in the inflorescences. Ducke also characterized this species by its coppery indument, petiole length (1.8–3 cm), and its white sweet aril. *Virola* has short petioles (to 1.5 cm long) and red aril. These three characters places this taxon in *Otoba*.

Otoba glycycarpa is related to O. parvifolia, and the two species are difficult to separate when only sterile material is available. The color of the abaxial leaf surface may help although it is not a constant character; it is whitish in O. parvifolia and ferrugineous in O. glycycarpa, but, as Ducke noted, the color is lost when the leaves become older. With pistillate flowers or fruits, the two species can be easily recognized. Otoba glycycarpa has a pubescent ovary and fruits with a 5-8 mm thick pericarp whereas O. parvifolia has a glabrous ovary and its pericarp is only 1-2 mm thick.

Acknowledgements – We thank the curators of the cited herbaria for lending us material in study. We are grateful to Renato Valencia, Laura Arcos and Alberto Padilla from Pontificia Universidad Católica del Ecuador in Quito for help and support, to Jens Christian Schou for the illustration and to Benjamin Øllgaard for latinizing the diagnosis. We would also like to thank an anonymous reviewer for several corrections and improvements to the manuscript. This work was supported financially by the Danish Natural Science Research Council's grant for the Danish Center for Tropical Biodiversity (#11-0390) and the Danida grant for research collaboration (104Dan.8L/241).

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