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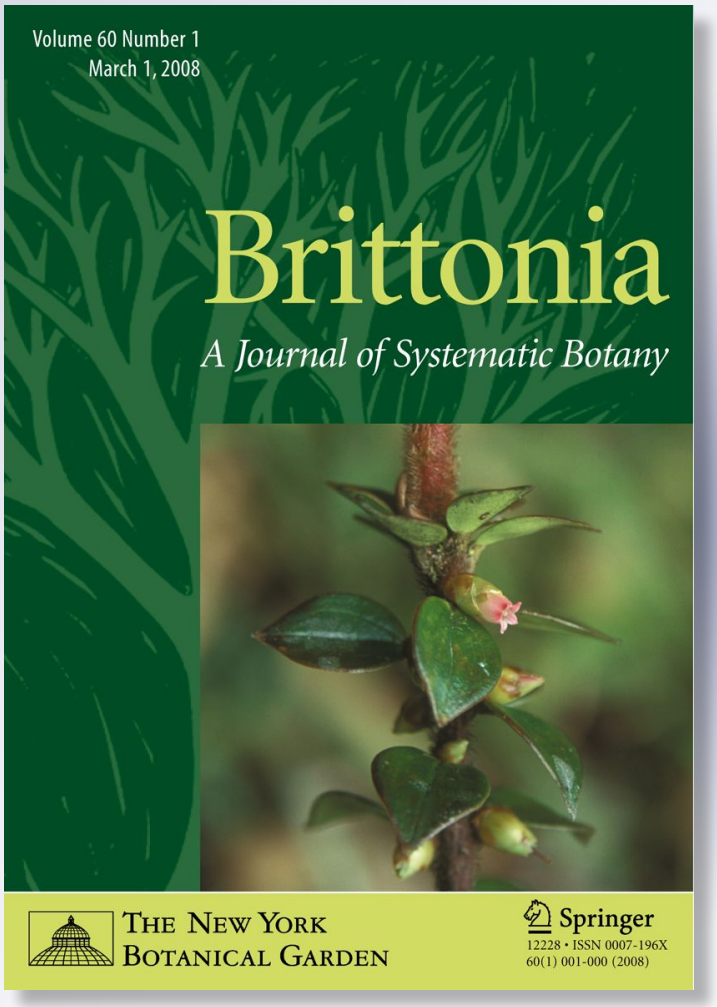

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Matayba obovata, a new species of *Matayba* sect. *Matayba* (Sapindaceae) from Brazil

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Abstract. The new species, **Matayba obovata** (Sapindaceae), from southern and southeastern Brazil is described, illustrated, and contrasted to its putatively closest relatives. Palynological characters are also described. The new species belongs to sect. *Matayba*. A key to identify *M. obovata* and related species in the Atlantic Forest is included.

Key Words: Atlantic Forest of Brazil, Taxonomy.

Matayba Aubl. (Sapindaceae) is one of several genera in the tribe Cupanieae (Radlkofer, 1879, 1933) and contains about 56 species restricted to the neotropics, from Mexico to northern Argentina. There are 31 species in Brazil, 17 of which are endemic, occurring in different types of vegetation (Somner et al., 2010). *Cupania* L. seems to be the most closely related genus to *Matayba*, as they share numerous characters considered synapomorphic (Somner & Ferrucci, 2004). The two genera can be distinguished because in *Matayba*, the sepals are fused forming a cupular calyx, 5-lobed to near the base, whereas in *Cupania* the sepals are free. Another distinction between the two genera is the valvate aestivation with precocious aperture of the calyx in *Matayba*, versus imbricate aestivation in *Cupania*.

Radlkofer (1933) divided *Matayba* into four sections, with *Matayba* sect. *Matayba* as the largest section, with 17 species restricted to South America. In Brazil, this section is predominantly extra-Amazonian, except for *M. guianensis* Aubl., with a widespread distribution, and *M. atropurpurea* Radlk. which is found in the Brazilian and Colombian Amazon. Another species, *Matayba elaeagnoides* Radlk., is found in Southern Brazil and adjacent Paraguay and northeastern Argentina. After the comprehensive treatment by Radlkofer (1933), only one new species, *M. cristae* Reitz, was cited in the flora of Santa Catarina, Brazil (Reitz, 1980). As a result of taxonomic research on Brazilian species of *Matayba*, we describe a new species that is also a member of this section. In order to provide a complete description of this new species, the analysis of pollen is included.

Materials and methods

This study is based on published literature, examination of herbarium specimens, and fieldwork. Herbarium material from CTES, ESA, HAS, HB, HRCB, HUEFS, IBGE, MBM, SP, SPF, SPSF, R, RB, UB, and VIC was studied.

In preparing specimens for the scanning electron microscope, leaf material preserved in FAA was dehydrated and then immersed in CO_2 for critical-point drying before coating. The voucher for this SEM study analysis was *Ferrucci et al. 2879* (CTES).

Pollen grains were obtained from the herbarium specimen *Ferreira et al. 37* (CTES). Samples for light microscopy (LM)

were acetolyzed according to the procedure of Erdtman (1966) and mounted in glycerin jelly. Permanent slides were deposited at the Palynological Laboratory of the Universidad Nacional del Nordeste, Corrientes, Argentina (PAL-CTES). The polar axis and equatorial diameter were measured on 20 grains using a Leica DM LB2 microscope. The terminology used to describe pollen grains follows Punt et al. (2007). The SEM micrographs were obtained with a JEOL 5800 LV scanning electron microscope operating at 20 KV.

Results

Matayba obovata R. Coelho, Souza & Ferrucci **sp. nov.** Type: Brazil. Paraná: Mun. de Bocaiúva do Sul, rodovia para o Parque das Lauráceas, rio Capivari, 1 Sep 1994 (fl), *J. M. Silva & C. B. Poliquesi 1397* (holotype: MBM; isotypes: HUEFS, RB, UB). (Figs. 1, 2)

Mataybae juglandifoliae (Cambess.) Radlk. affinis sed foliolis coriaceis, obovatis, oblanceolatis vel spatulatis, in sicco viridi-flavis vel aurantiacis, nervis secondariis rectis, in paria 6–12 dispositis, eis atque tertiariis in pagina inferiore prominentibus, floribus 3–5 mm longis, epicarpio glabro vel subglabro differt.

Trees (2–)7–16(−30) m tall, monoecious, with functionally unisexual flowers; the branches glabrous or subglabrous. *Leaves* alternate, glabrous or subglabrous, pinnately compound, imparipinnate; petiole 2.4–7.3 cm long, terete or semiterete; rachis semiterete, 2–18.5 cm long, glabrous or subglabrous; leaflets 2–8, subopposite or alternate, subsessile, obovate or less often oblanceolate or spatulate, 6.1–19.9×1.9–8.3 cm, coriaceous, concolorous or discolorous, greenish-yellow to orangish shiny (when dry), with sparse long hairs on both surfaces, the apex retuse or obtuse, the base cuneate, attenuate or oblique, the margins entire, revolute when dry; venation brochidodromus, the adaxial venation very prominently reticulate, midvein impressed or slightly prominent, secondary veins inconspicuous, straight, 6–12 pairs with angles of 50–60° in medial area of blade, the abaxial venation with very prominent midvein, secondary and tertiary veins prominent, sometimes with pit domatia in the secondary vein axils. *Inflorescences* axillary, paniculiform, shorter or equal to the subtending leaf; peduncle 1.1–6.3 cm long, glabrous or puberulent; the rachis 1.7–8.6(−23) cm long, subglabrous to pubescent; bracts ca. 1.5 mm long, triangular-ovate, pubescent; the bracteoles similar but smaller; pedicels 1–3 mm long, pubescent, articulate from the base to the middle. *Flowers* 3–5 mm long; sepals 1.5–2 mm long, connate to the middle, ovate or widely ovate, rounded, obtuse or acute at apex, slightly puberulent to pubescent abaxially, subglabrous adaxially; petals 1–2 mm long, obovate or ovate, emarginate or rounded at apex, glabrous or subglabrous abaxially, pubescent adaxially; appendage bifid, shorter or as long as petals, villose; nectary disc glabrous; stamens 8: stamens in staminate flowers 2–5 mm long, lower half villous, upper half glabrous or subglabrous, generally straight; pistillode ca. 1 mm, pubescent; stamens in pistillate flowers indehiscent, 1.5–2 mm long, filaments villose; gynoecium ca. 4 mm long, the ovary ca. 2 mm long, ovate, densely pubescent, the style ca. 2 mm long, the stigma lobes papillate. *Capsules* loculicidal, 3-valved, obovate in outline, 1.1×0.7–1.3 cm, the locules globose, 3-seeded, the stipe ca. 2 mm long, the pericarp coriaceous, subverrucose, puberulous to subglabrous, with minute, adpressed trichomes; endocarp ferruginous-villous. *Seeds* not observed. *Pollen grains* parasyncolporate, subisopolar, apocolpial field of different size, peroblate or oblate, polar axis 15.5 (17.9) 21.7 μm, equatorial diam. 28 (34.71) 43.4 μm, exine rugulate.

Distribution, ecology, and phenology.—Restricted to the states of Rio de Janeiro, São Paulo and Paraná, exclusively from the Atlantic Forest in the coastal regions, occurring in the transition between mountain and restinga forest between 10 and 800 m elevation. Flowering from April to December, fruiting from September to December.

Etymology. —The specific epithet refers to the obovate leaflets.

Additional specimens examined: BRAZIL. Paraná: Morretes, Pilão de Pedra, 3 Sep 1961 (fl), *G. Hatschbach 8196* (MBM); Morretes, Morro Mãe Catira, 29 Sep 1962 (fl), *G. Hatschbach 9244* (MBM); Morretes, Guaratuba, rio da Divisa, 12 Sep 1962 (fl), *G. Hatschbach 9269* (HAS, MBM); Paranaguá, Tabuleiro do Guarani, 2 Nov 1965 (fl), *G. Hatschbach 13082* (MBM); Morretes, Picada Engenheiro Lange-Marumbi, 1 Dec 1966 (fr), *G. Hatschbach 15322* (MBM, VIC); Guaraqueçaba, Serrinha, 13 Sep 1967 (fl), *G. Hastchbach 17187*

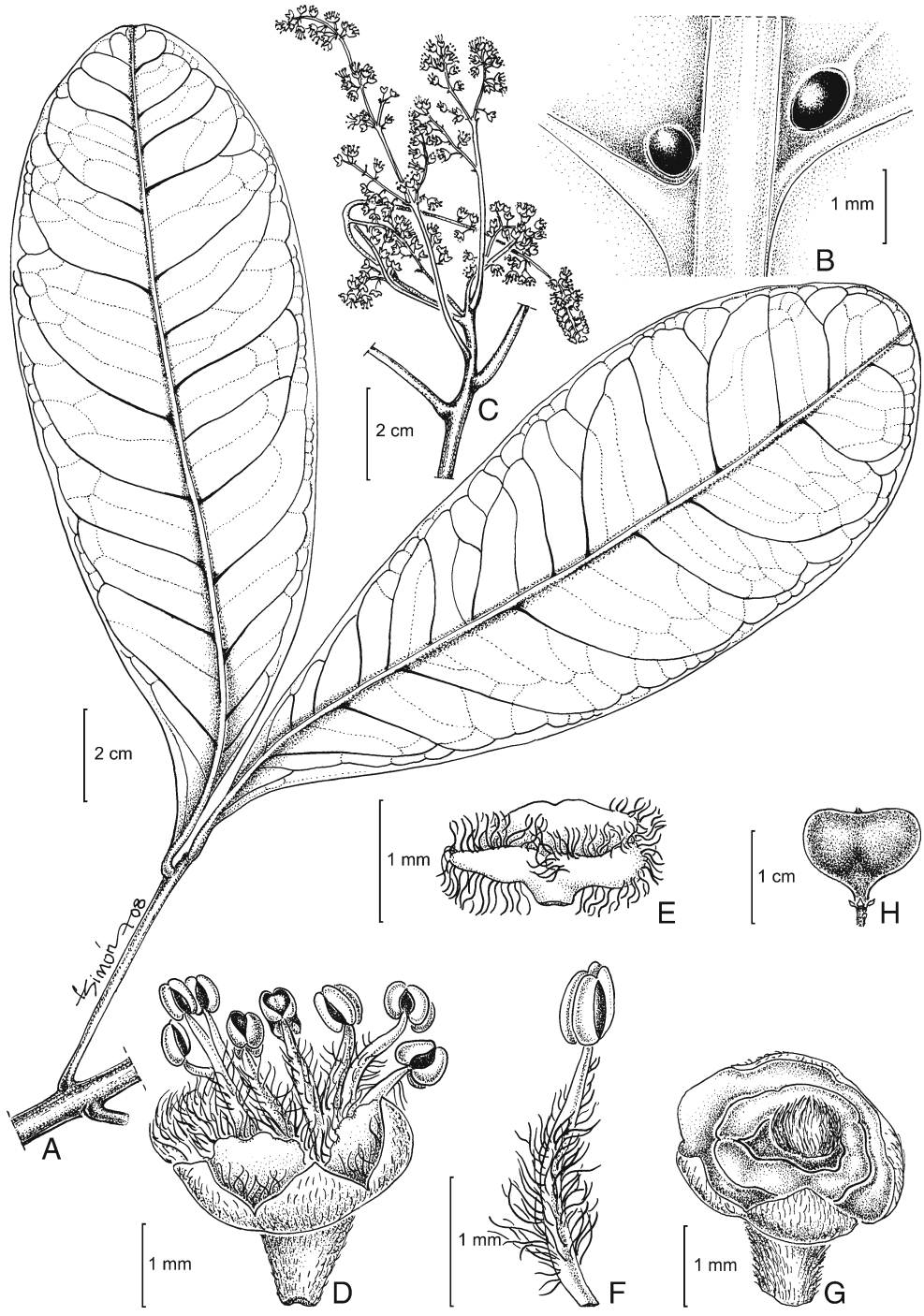

Fig. 1. *Matayba obovata*. **A.** Leaf. **B.** Leaflet, detail of pit domatia on the abaxial surface. **C.** Inflorescence. **D.** Staminate flower. **E.** Petal with adnate appendage. **F.** Stamen from staminate flower. **G.** Staminate flower with petals and stamens removed showing nectary disk and pistillode. **H.** Immature fruit. (**A**–**G** from isotype *Silva & Poliquesi 1397*, HUEFS; H from *Hatschbach & Kasper 41586*, IBGE.)

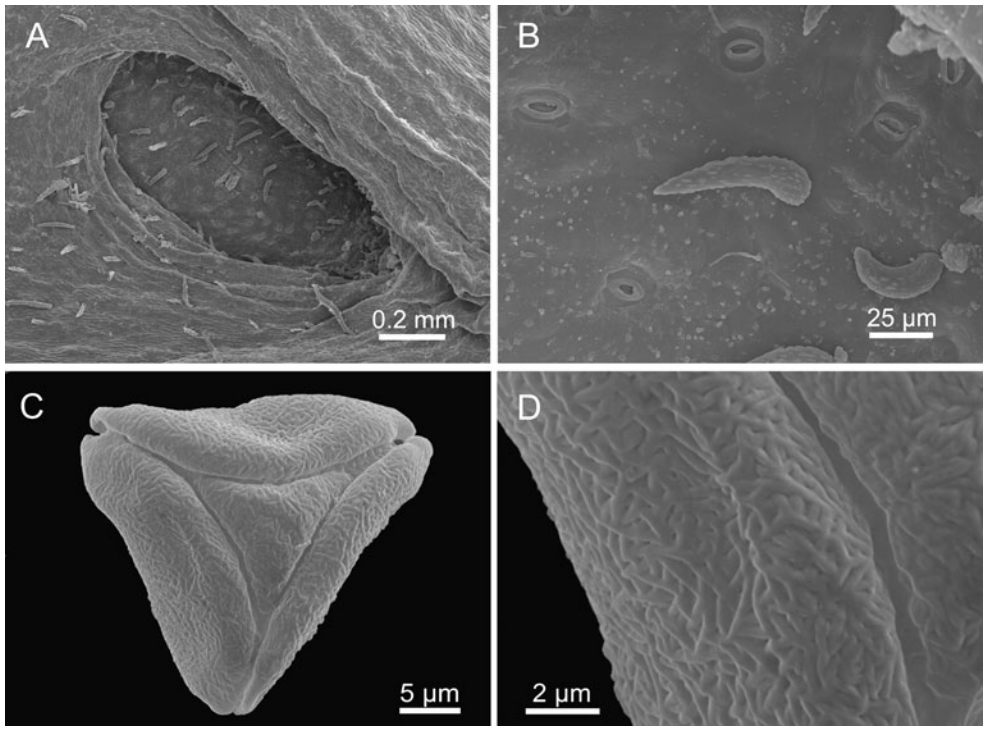

Fig. 2. Scaning electron micrographs of *Matayba obovata*. **A.** Leaflet abaxial surface, detail of the intersection of the mid and secondary veins showing a pit domatia. **B.** Detail of the domatium floor showing stomata and hairs. **C.** Pollen, polar view. **D.** Detail of mesocolpium. (A, B from *Ferrucci et al. 2879*, CTES; C, D from *Ferreira et al. 37*, CTES.)

(MBM); Guaratuba, rio Imbira, 15 Jul 1971 (fl), *G. Hatschbach 26855* (MBM); Antonina, Sapimanduva, 25 Oct 1972 (fl), *G. Hatschbach 30548* (MBM); Morretes, Col. Limeira, 6 Oct 1978 (fr), *G. Hatschbach & A. Kasper 41586* (CTES, IBGE, MBM); Antonina, bairro Alto, 23 Apr 1982 (fl), *G. Hastchbach 44876* (MBM); Morretes, estrada Marumbi, 30 Oct 1984 (fl), *G. Hatschbach & F. Cardoso da Silva 48559* (HUEFS, MBM); Morretes, estrada Graciosa, proximo a Grota Funda, 12 Dec 1989 (fl), *J. M. Silva & G. Hatschbach 750* (MBM). **Rio de Janeiro:** Miguel Pereira, REBIO Tinguá, estrada do Ouro, proximidades do rio São Pedro, 13 Nov 2001 (fr), *S. J. Silva Neto 1504* (RB). **São Paulo:** Iguape, Estação Ecológica Juréia-Itatins, Serra da Juréia, trilha do Imperador, em direção a praia do Rio Verde, 12 Dec 1992 (fr), *E. A. Anunciação et al. 137* (SP, SPSF); Iguape, Estação Ecológica Juréia-Itatins, Serra da Juréia, caminho em direção do Imperador em direção a Juréia, 28 Oct 1993 (fr), *E. A. Anunciação & L. Rossi 384* (SP); Iguape, Estação Ecológica Juréia-Itatins, Serra da Juréia, trilha para o campo próximo ao alojamento do IBAMA, 19 Sep 1990 (fr), *I. Cordeiro et al. 695* (SP); Cananéia, estrada Cananéia - Pariquera-Açu (via ponte), ca. 19 km de Cananéia, 6 Sep 1994 (fl), *V. F. Ferreira et al. 37* (CTES, SP); Peruíbe, Estação Ecológica da Juréia, 4 May 2009 (st), *M. S. Ferrucci et al. 2879* (CTES, ESA); Ribeirão Branco, Parque Estadual de Carlos Botelho, km55, ca. 23 km do núcleo do Parque, 3 Sep 1987 (fl), *A. Gentry 58893* (SPF, SPSF); São Paulo, Jardim Novo Parelheiros, sítio do Sr. José Guilguer Reimberg (José Toco), a direita na estrada Engenheiro Marsilac, após o entroncamento com a estrada da Colônia, 14 Sep 1994 (fl), *S. A. P. Godoy et al. 247* (SPF); Pariquera-Açu, Estação Experimental do Instituto Agronômico, 23 Aug 1995 (fl), *N. M. Ivanauskas 291* (ESA); Iguape, Estação Ecológica Juréia-Itatins, Serra da Juréia, trilha da Figueira, banco de areia na travessia do Rio Verde, 19 Sep 1994 (fl), *M. C. H. Mamede 585* (SP); São Miguel Arcanjo, P. E. C. Botelho, 6 Oct 1991 (fr), *P. L. de Moraes 488* (HRCB, SPSF); São Miguel Arcanjo, Parque Estadual Carlos Botelho, 9 Sep 1992 (fl), *P. L. de Moraes 706* (CTES, ESA); São Miguel Arcanjo, Parque Estadual de Carlos Botelho, 4 Oct 1996 (fl), *P. L. R. de Moraes 1285* (ESA); Iguape, Estação Ecológica de Juréia-Itatins, 27 Aug 1983 (fl), *J. R. Pirani 817* (SPF); Iguape, Estação Ecológica Juréia-Itatins, trilha do Imperador, 18 Oct 1990 (fr), *L. Rossi et al. 732* (SP); Peruíbe, Estação Ecológica da Juréia, Praia do Arpoador, 1 Oct 1988 (fr inmature), *V. C. Souza 104* (ESA); Iguape, Reserva Biológica da Juréia, margem do Rio Verde, 15 Aug.1991 (fl), *M. Sugiyama et al. 920* (SP); São Miguel Arcanjo, Parque Estadual de Carlos Botelho, 24 Sep 1992 (bud), *M. Sugiyama 1038* (SP, SPSF); Mogi das Cruzes, Parque Municipal da Serra do Itapety, 4 May 1993 (fl), *P. L. B. Tomasulo 380* (SP).

TABLE I
COMPARATIVE MORPHOLOGY OF *MATAYBA OBOVATA* AND *M. JUGLANDIFOLIA*.

Characters observed in dried material	*M. obovata*	*M. juglandifolia*
Leaflet: Texture	Coriaceous	Chartaceous or subcoriaceous
Color	Greenish-yellow to orangish	Greenish
Apex	Obtuse or rounded	Acute
Secondary veins	Straight, 6–12 pairs	Arched, 6–18 pairs
Angles of the secondary veins	50–60°	60–80°
Flower length	3–5 mm	5–7 mm
Style length	3–4 mm	5–7 mm
Epicarp	Glabrous or subglabrous	Pubescent
Distribution	Rio de Janeiro, São Paulo and Paraná	Minas Gerais, Rio de Janeiro and São Paulo
Ecology	Atlantic coastal forests	Tropical semideciduous forests

Following the sectional treatment of Radlkofer (1933), the new species fits the morphological definition of section *Matayba* because of its shortly stipitate, trigonal, subglobose and generally coriaceous capsules, petals with a bifid appendage, and the glabrous nectary disk. Among the other species of this section, M. *obovata* resembles *M. juglandifolia* but differs in several features as indicated in Table I. Several herbarium collections of *M. obovata* have been erroneously identified as *M. juglandifolia*. *Matayba obovata* is restricted to the tropical rain forest (Atlantic coastal forest), whereas *M. juglandifolia* is common in tropical semideciduous forests.

Key to identify *M. obovata* and related species in the Atlantic Forest of Brazil

1. Leaflet venation adaxially inconspicuous.....*M. intermedia* Radlk.
1. Leaflet venation adaxially prominent.
   2. Leaflets 6–12(−14); secondary veins curved, abaxially usually with urceolate domatia.....*M. elaeagnoides* Radlk.
   2. Leaflets 2–10; secondary veins straight, abaxially usually without domatia or rarely with pit domatia.
      3. Leaflets greenish (when dry), chartaceous or subcoriaceous, with 8–16 pairs of secondary veins, slightly prominent abaxially; flowers 5–7 mm long; epicarp pubescent.....*M. juglandifolia* (Cambess.) Radlk.
      3. Leaflets greenish-yellow to orangish (when dry), coriaceous, with 6–12 pairs of secondary veins, secondary and the tertiary veins prominent abaxially; flowers 3–5 mm long; epicarp glabrous or subglabrous.....*M. obovata* R. Coelho, Souza & Ferrucci.

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Literature Cited

Erdtman, G. 1966. Pollen morphology and plant taxonomy. Angiosperms. Hafner, New York

Punt, W., P. P. Hoen, S. Blackmore, S. Nilsson & A. Le Thomas. 2007. Glossary of pollen and spore terminology. Review of Paleobotany and Palynology 143: 1–81.

Radlkofer, L. 1879. Ueber *Cupania* und damit verwandte Pflanzen. Sitzungsberichte der Mathematisch-

Physikalischen Classe der k.b. Akademie der Wissenschaften zu München 4**:** 457–678.

———. 1933. Sapindaceae. In: A. Engler (ed.), Das Pflanzenreich 4, 165: 1020–1062 (Verlag von H. R. Engelmann, J. Cramer, Weinheim/Bergstrasse, 1965).

Reitz, R. 1980. Sapindáceas. In: R. Reitz (ed.), Flora Ilustrada Catarinense, parte I, fasc. Sapi. Itajaí, Herbário 'Barbosa Rodrigues', l56 Pp.

Somner, G. V. & M. S. Ferrucci. 2004. A new species of *Cupania* sect. *Trigonocarpus* (Sapindaceae) from Brazil. Botanical Journal of the Linnean Society 146: 217–221.

———, Ferrucci, **M. S.**, **P. Acevedo-Rodríguez & G**. **R. Coelho.** 2010. Sapindaceae. Pp. 1606–1620. Campostrini Forzza, R. & P. Leitman (coord.), Catálogo de Plantas e Fungos do Brasil. Vol. 2. Angiospermas. Pp. 868–1699. Gráfica Santa Marta. Jardim Botânico do Rio de Janeiro.