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Three new species of Dendropanax Decne. & Planch. (Araliaceae) from São Paulo state, Brazil

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ABSTRACT

FIASCHI, P. & S. L. JUNG-MENDAÇOLLI (2006). Three new species of Dendropanax Decne. & Planch. (Araliaceae) from São Paulo state, Brazil. *Candollea* 61: 457-466. In English, English, French and Spanish abstracts.

Three new species of *Dendropanax* from the state of São Paulo are described and illustrated: *Dendropanax australis* Fiaschi & Jung-Mendaçolli, which occurs in the Atlantic rain forests from the southern coast of São Paulo state to the states of Paraná and Santa Catarina; *Dendropanax denticulatus* Fiaschi, from the Serra del Mar near to São Luís de Paraitinga, in the northern coast of São Paulo state; *Dendropanax nebulosus* Fiaschi & Jung-Mendaçolli, which has a patchy distribution in high altitude areas near the coast in São Paulo state.

RÉSUMÉ

FIASCHI, P. & S. L. JUNG-MENDAÇOLLI (2006). Trois nouvelles espèces de Dendropanax Decne. & Planch. (Araliaceae) de l'Etat de São Paulo, Brésil. *Candollea* 61: 457-466. En anglais, résumés anglais, français et espagnol.

Trois nouvelles espèces de *Dendropanax* de l'Etat de São Paulo sont décrites et illustrées: *Dendropanax australis* Fiaschi & Jung-Mendaçolli des forêts humides de la côte Atlantique des rivages sud de l'Etat de São Paulo jusqu'à ceux des Etats de Paraná et de Santa Catarina; *Dendropanax denticulatus* Fiaschi, de la Sierra del Mar jusqu'à la proximité de São Luís de Paraitinga, sur la côte nord de l'Etat de São Paulo; *Dendropanax nebulosus* Fiaschi & Jung-Mendaçolli, qui a une distribution disjointe en haute altitude, à proximité de la côte de l'Etat de São Paulo.

RESUMEN

FIASCHI, P. & S. L. JUNG-MENDAÇOLLI (2006). Tres nuevas especies de Dendropanax Decne. & Planch. (Araliaceae) del estado de São Paulo, Brasil. *Candollea* 61: 457-466. En Inglés, resumenes en inglés, francés y español.

Tres nuevas especies de *Dendropanax* del estado de São Paulo son descritas y dibujadas: *Dendropanax australis* Fiaschi & Jung-Mendaçolli, que ocurre en bosques úmedos de la cuesta Atlántica desde el litoral sur de São Paulo hasta Paraná y Santa Catarina; *Dendropanax denticulatus* Fiaschi, conocida solamente de la Sierra del Mar, en las proximidades de São Luís de Paraitinga, en el litoral nord del estado de São Paulo; *Dendropanax nebulosus* Fiaschi & Jung-Mendaçolli, con distribución disjunta en áreas con altitud elevada cercano del litoral del estado de São Paulo.

KEY-WORDS: ARALIACEAE – Dendropanax – Brazil – São Paulo state – Atlantic rain forests – Taxonomy

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Dendropanax Decne. & Planch. comprises ca. 100 species from tropical and subtropical Asia and Central and South America, most of which (up to 70 spp.) are restricted to the Neotropics (FRODIN & GOVAERTS, 2003; FRODIN, 2004). In the Americas, the genus is largely limited to elevations below 1200 m, except in Middle America and the coastal cordillera of Venezuela (FRODIN, 1995). It is best represented in the forests of southern Mesoamerica (CANNON & CANNON, 1989), Jamaica (with ca. 10 endemic spp., FRODIN & GOVAERTS, 2003), northwestern South America, and in the rain forests of eastern Brazil, where more than 10 endemic species occur (FIASCHI, 2005).

Dendropanax includes glabrous, monoecious plants with simple or palmatilobed leaves often 3-nerved at the base and dotted along the blade, small intrapetiolar stipules, unarticulated pedicels, 5-9-merous flowers grouped in solitary or racemosely to umbellately arranged umbels, glandular anthers, and fruits usually with a distinct stylar column (MERRIL, 1941; NEVLING, 1959; HUTCHINSON, 1967; JUNG-MENDAÇOLLI & CABRAL, 2000; CANNON & CANNON, 2001).

No world wide taxonomic revision of *Dendropanax* has ever been published, and the available literature remains insufficient and out-dated (CANDOLLE, 1830; DECAISNE & PLANCHON, 1854; MARCHAL, 1878; HARMS, 1894). Some recent contributions that improved the taxonomic knowledge of American *Dendropanax* include CANNON & CANNON (1989) and FIASCHI (2005).

A recent phylogenetic analysis using ITS sequence data suggested that *Dendropanax* is related to *Hedera* (WEN & al., 2001), but PLUNKETT & al. (2004), using both ITS and *trn*L-*trn*F sequences, showed this relationship to be uncertain and placed *Dendropanax* within the "Asian Palmate clade" of "core Araliaceae" where its relationships are not fully resolved. LOWRY & al. (2004) suggested that changes in the circumscription of *Dendropanax* may be required in order to achieve monophyly, since the genus has a disjunct Asian-Neotropical distribution and evidence supporting a sister relationship between these two continental groups is still lacking.

While preparing the taxonomic treatment of *Araliaceae* for the "Phanerogamic Flora of São Paulo state" project, we found several taxonomic novelties in *Dendropanax*, which are here described, illustrated, and discussed.

Dendropanax australis Fiaschi & Jung-Mendaçolli, **spec. nova** (Fig. 1).

Typus: BRAZIL. São Paulo: Sete Barras, a cerca. 2 km em direção a São Miguel Arcanjo, 1.IV.1983, *W. M. Ferreira & al. UEC14573* (holo-: UEC).

A D. exili (Toledo) Jung inflorescentiis simplicibus differt.

Shrubs to treelets, 0.5-3 m high. Young branches 2-5 mm diam., striate longitudinally; stipules reduced, up to 1.5 mm long. **Leaves** alternate, spirally arranged, internodes up to 2 cm long; petiole 1.0-4.6(-10) cm long, slightly compressed laterally, adaxially plane to slightly canaliculate; blade horizontal, plane, membranous to subchartaceous, with reddish schizogenous dots indistinct to the naked eye, 7-22 cm long, 2.5-8.5 cm wide, elliptic, symmetric to distinctly asymmetric, apex acuminate (acute), sometimes mucronate, base cuneate to attenuate (rounded), margin entire, sometimes with up to 5 pairs of small denticulations less than 1 mm long, slightly revolute; venation acrodromous, suprabasal imperfect; primary vein prominent on both surfaces, more so on abaxial one; secondaries 7-11 pairs, brochidodromous, slightly prominent abaxially; basal pair up to ca. 0.5 cm above blade base, angle of divergence 40°-50°, other pairs with angle of divergence 60°-70°, intersecondary veins present, clearly distinct from secondaries; tertiary veins and reticulation evident to hardly visible on abaxial surface. **Inflorescence** a simple umbel, terminal, erect; main axis 0.7-3 cm long, with linear to triangular bracts near the base. Umbel 30-40-flowered, the common receptacle elongating up to 5 mm long. **Flowers** with pedicel 5-10 mm long; calyx lacinia 5, evident, denticulate; petals 5, greenish, elliptic, ca. 2 mm long, 0.7 mm wide, apex cucculate, ca. 0.5 mm long; stamens included, filament ca. 1 mm long, anthers ca. 1 mm long, 0.8 mm wide, glandular on abaxial surface; ovary 5-carpellate. **Fruits** obloid, 5-ribbed when dry, 5 mm long, 6 mm wide, styles united in column up to 0.5 mm long, stigmas 5; pyrenes 5, ca. 5.5 mm long, 3 mm wide, pedicels 6-11 mm long.

Paratypi. – **Brazil. Paraná:** Antonina, Estrada Cacatu/Serra Negra, 19.I.1966, *G. Hatschbach 13546* (MBM); Guaraqueçaba, Serrinha, 13.IV.1967, *G. Hatschbach 16318* (MBM); Guaratuba, Brejauba, 19.V.1991, *J. M. Silva 1013* (MBM), idem, Rio Capivara, 27.II.1995, *J. M. Silva 1446* (MBM); Morretes, Rio Ipiranga, Alto do Inferno, 13.III.1949, *G. Hatschbach 1242* (MBM, US); Paranaguá. Ilha do Mel, Morro Bento Alves, 26.III.1988, *S. M. Silva & al. 1474* (MBM, NY). **Santa Catarina:** Blumenau, Bom Retiro, Mata da Companhia Hering, 10.III.1960, *R. Klein 2388* (US); Brusque, Azambuja, 8.IV.1954, *R. Reitz 5836* (US); idem, Mato de Malucher, ca. 27°06'S 48°54'W, 23.II.1952, *L. B. Smith 5777* (US); idem, Ribeirão do Ouro, 8.V.1950, *R. Reitz 3545* (US); Ibirama, Horto Florestal, 14.VI.1956, *R. Reitz & R. Klein 2077* (HBR, NY, US); idem, 19.V.1956, *R. Klein 2011* (US); Itajaí, Braço Joaquim, Luís Alves, 13.I.1954, *R. Klein 1062* (HBR, NY, US); Pilões, Palhoça, 5.IV.1956, *R. Reitz & R. Klein 3035* (US); idem, 19.I.1956, *R. Reitz & R. Klein 2504* (US); idem, 6.II.1956, *R. Reitz & R. Klein 2657* (US); Pirão Frio, Sombrio, 17.III.1960, *R. Reitz & R. Klein 9558* (US); São Francisco do Sul, Três Barras, Garuva, 27.II.1958, *R. Reitz & R. Klein 6487* (US). **São Paulo:** Cananéia, Parque Estadual da Ilha do Cardoso, 6.IV.1982, *M. C. B. Attié & al. 14* (SP); idem, 20.IV.1983, *S. A. C. Chiea 300* (SP); idem, 7.VI.1983, *F. de Barros 823* (SP); idem, 5.III.1985, *M. M. R. F. Melo & al. 542* (IAC, SP); idem, 5.III.1985, *F. de Barros 1038* (IAC, SP); idem, 18.IV.1985, *M. Kirizawa & T. M. Cerati 1452* (SP); idem, 8.IV.1986, *F. de Barros & P. Martuscelli 1250* (SP); idem, 17.V.1988, *M. Kirizawa & M. Sugiyama 2036* (SP); Iguape, Morro do Cristo, 24°39'18"S 41°29'28"W, 15.II.1995, *H. F. Leitão-Filho & al. 33538* (UEC); idem, *H. F. Leitão-Filho & al. 33539* (SP, UEC); idem, Peropava, 24°34'-36'S 47°37'-40'W, 30.V.1986, *E. L. M. Catharino 770* (IAC); idem, Reserva Ecológica da Juréia, 21.VI.1990, *M. C. H. Mamede & al. 277* (SPSF); idem, Estação Ecológica Juréia-Itatins, trilha do Imperador, 24.IV.1991, *M. R. F. Melo & al. 937* (SPSF); idem, 11.III.1992, *L. Rossi & al. 1042* (SPSF); idem, 15.III.1990, *I. Cordeiro & al. 553* (SPSF); Mamparra, Reserva Florestal Carlos Botelho, 15.II.1995, *P.H. Miyagi & al. 507* (IAC); Pariquera-açú, 24°36'30"S 47°53'06"W, 10.II.1995, *H. F. Leitão-Filho & al. 33312* (UEC); Peruíbe, Estação Ecológica da Juréia, IV.1991, *M. Sobral & D. Attili 6945* (HRCB); Registro, Rodovia SP 139, Km 7, 50 m alt., 13.V.1994, *R. Mello-Silva & al. 962* (IAC, SPF, UEC); Sete Barras, ca. 2 km em direção a S. Miguel Arcanjo, 1.IV.1983, *W. M. Ferreira & al. 14573* (UEC); idem, 12.III.2004, *M. Galetti & al. 122* (IAC).

Distribution and habitat. – *Dendropanax australis* is endemic to Brazil, where it is a common understory shrub in the rain forests that ranges from the southern coast of São Paulo state to the states of Paraná and Santa Catarina.

Etymology. – The epithet refers to the southern distribution of this species when compared to that of other Brazilian members of *Dendropanax*. Its known distribution lies entirely within the subtropics.

Phenology. – This species has been collected with flowers and fruits from February to June.

Note. – *Dendropanax australis* appears to be related to *D. exilis* (Toledo) Jung, from which it can be distinguished by its simple (vs. branched, with 2-5 secondary branches) inflorescences. Contrary to *D. exilis*, which is endemic to the surroundings of the city of São Paulo (Jung, 1981), *D. australis* is restricted to the southern coast of the state, with its northern limit in the municipality of Bertioga, and the states of Paraná and Santa Catarina.

The invalidly published name *D. pauciflorus* Decne. & Planch. was previously applied to herbarium material of this new species (*A. St.-Hillaire 37050*, photo at MO and US), and was cited as a synonym under *D. monogynus* (Vell.) Seem. by Marchal (1878) and Frodin & Govaerts (2003) based on Decaisne & Planchon (1854). Since these latters had not even cited it in their species list of the genus *Dendropanax*, we suggest *Dendropanax pauciflorus* should not be further considered.

Although some collections of this new species were treated by Jung-Mendaçolli & Cabral (2000) as *D. monogynus*, we believe *D. australis* be distinctive. Despite sharing simple inflorescences with *D. monogynus*, *D. australis* can be distinguished by the oblong or elliptic (vs. ovate)

leaves with hardly visible (vs. usually conspicuous) reddish schizogenous dots on abaxial surface of blade, inflorescences with short axes (up to ca. 3.5 cm long vs. 5.5-21 cm long), and smaller flowers with developed calyx lobes (vs. larger flowers with less conspicuous calyx lobes).

Dendropanax denticulatus Fiaschi, **spec. nova** (Fig. 2).

Typus: Brazil. São Paulo: São Luís de Paraitinga. Parque Estadual da Serra do Mar, núcleo Santa Virgínia, trilha para a Cachoeira do Poço do Pito, pouco antes cachoeira, 4.I.2003, *P. Fiaschi, M. Groppo Jr., L. R. Lima & D. Sasaki 1252* (holo-: SPF!; iso-: CEPEC!, F!, G!, IAC!, K!, MBM!, MO!, NY!, RB!, SP!, U!).

Inter congeneros foliis dimidius distalibus leviter crenulatis et irregulariter denticulatis insignis.

Trees 7-10 m high. Young branches 3.5-5.0 mm diam.; stipules reduced, ca. 1 mm long. **Leaves** alternate, spirally arranged, internodes up to 4 cm long; petiole up to 17 cm long, slightly striate longitudinally; blade horizontal, plane, membranous to subchartaceous, with reddish schizogenous dots inconspicuous to the naked eye, 8.5-19.5 cm long, 4.7-11.5 cm wide (near inflorescence: 4-7 cm long, 2-3 cm wide), trullate to widely trullate, slightly assymetric, apex acute to attenuate or slightly acuminate, base cuneate to obtuse, margin slightly crenulate, with teeth irregularly distributed distally to widest region of blade; teeth terminating secondary veins and some of its distal ramifications, pointed toward the apex, cassidate; venation acrodromous, suprabasal, imperfect; primary vein prominent on both surfaces, more distinctly so on abaxial one; secondaries 5-7 pairs, eucamptodromous, prominent only on abaxial surface; basal pair up to 1.5 cm above blade base, angle of divergence 30°-40°, other pairs with angle of divergence 60°-70°; tertiary veins and reticulation evident on abaxial surface. **Inflorescence** apparently a compound umbel, terminal, erect, main axis 1-1.5 cm long; secondary axes 8-9 (of which 6-8 are terminal), 3-9 cm long, each with 2-3 whorled or alternate and spirally arranged bracts. Umbels ca. 50-flowered. **Flowers** with pedicel purplish, (7-)10-20 mm long; calyx lacinia 5, reduced, minutely denticulate; petals 5, greenish, ovate, 2.8-2.9 mm long, 1.7-1.9 mm wide, apex cucculate; stamens with filament ca. 3.2 mm long, anthers versatile, 1.6-1.8 mm long, 1.1-1.3 mm wide, glandular on abaxial surface; ovary 5-6-carpellate. **Fruits** 5(-6)-ribbed, 7-8 mm long, 8-9 mm wide, styles united in column 1.5-2 mm long, stigmas 5; pyrenes 5(-6), 6.2-6.5 mm long, 3.5-3.8 mm wide; pedicels 15-22 mm long.

Paratypus. – **Brazil. São Paulo:** São Luís de Paraitinga. Parque Estadual da Serra do Mar, núcleo Santa Virgínia, trilha para a Cachoeira do Poço do Pito, beira da cachoeira, 19.I.2001, *P. Fiaschi & A. Lobão 554* (CEPEC, IAC, K, SPF).

Distribution and habitat. – *Dendropanax denticulatus* appears to be restricted to the Serra do Mar mountain range, were it was collected only in the northern coast area of São Paulo state, within the limits of the "Parque Estadual da Serra do Mar, núcleo Santa Virgínia", in the municipality of São Luís de Paraitinga. *Dendropanax langsdorfii* (Marchal) Frodin, which appears to be related to *D. denticulatus*, is endemic to some areas of montane forests of the Serra do Mar in Rio de Janeiro state, 250-300 km far away from São Luís de Paraitinga.

Phenology. – Collected with flowers and fruits in January.

Etymology. – The epithet chosen makes reference to the distinctly denticulate margin of the leaves, a feature not commonly found in other eastern Brazilian species of *Dendropanax*.

Note. – *Dendropanax denticulatus* can be easily distinguished from other species of the genus occurring in the same region by its leaves with a slightly crenulated margin irregularly toothed above the widest portion of blade, trullate to widely trullate blade (Hickey, 1979), and venation that is distinctly acrodromous, suprabasal and imperfect (also found in *D. nebulosus* Fiaschi & Jung-Mendaçolli, but not characteristic of *D. langsdorfii*, both presumably related to *D. denticulatus*).

This new species is probably related to *D. langsdorfii*, sharing an arboreal habit, inflorescences branched with ten or more (up to ca. 20) primary branches, and long-pedicellated flowers (pedicels 7-20 mm long). As discussed above, however, the leaf morphology of *D. denticulatus* is quite different, and the fruits are much larger that those of *D. langsdorfii* (7-8 x 8-9 mm vs. ca. 3 x 3.5 mm), both features being clear enough to justify recognizing it as a distinct species.

Dendropanax nebulosus Fiaschi & Jung-Mendaçolli, **spec. nova** (Fig. 3).

Typus: BRAZIL. São Paulo: Serra da Cantareira, região do Pinheirinho, área 04, 23.IV.1991, *O. T. Aguiar 407* (holo-: SPSF).

Species a D. langsdorfii proxima, a qua foliis nervatione manifeste acrodroma imperfecte suprabasalique, nervis tertiaris, quaternaris, retique abaxialiter inconspicuis distincta est.

Treelets to small trees 2-9 m high. Young branches 2.0-3.5 mm diam., longitudinally striate; stipules reduced, up to 1 mm long. **Leaves** alternate, spirally arranged, with internodes up to 3.5 cm long; petioles 1-8.5 cm long, slightly compressed laterally; blade horizontal, plane, membranaceous to subchartaceous, reddish schizogenous dots visible to almost imperceptible to the naked eye on abaxial surface, 5-15 cm long, 2-6 cm wide, narrowly elliptic to lanceolate, symmetric to slightly assymetric, apex attenuate to acute, mucronulate, base attenuate to obtuse (rounded), margin entire or with up to 4 pairs of small denticulations on distal half, slightly revolute; venation acrodromous, suprabasal, imperfect; primary vein prominent on both surfaces, more so on abaxial one; secondaries 4-7, brochidodromous, only slightly prominent on abaxial surface; basal pair 3-8 mm above blade base, angle of divergence 25-30°, other pairs with angle of divergence 45-70°; tertiary veins and reticulation hardly visible. **Inflorescences** apparently a compound umbel, terminal or pseudolateral, erect, main axis 0.5-1.5 cm long; secondary axes 4-7, umbellately arranged, with or without a whorl of bracts in proximal half, 1.5-8 cm long. Umbels 25-35-flowered. **Flowers** with pedicels 2-7 mm long; calyx lacinia 4-5, reduced, minutely denticulate; petals 4-5, ca. 1.8 mm long, 1 mm wide, greenish, ovate, apex cucculate; stamens 4-5, with filament ca. 2 mm long, anthers versatile, 0.7-1 mm long, 0.5-0.8 mm wide, glandular on abaxial surface; ovary 4-5-carpellate. **Fruits** yet unknown.

Paratypi. – **Brazil. Rio de Janeiro:** Itatiaia, Rio Bonito, 900 m alt., 24.V.1935, *A. C. Brade 14549* (IAC); **São Paulo:** Pindamonhangaba – Ribeirão Grande, Fazenda São Sebastião do Ribeirão Grande, 900 m alt., 31.III.1994, *L. Rossi, I. Cordeiro, J. A. Pastore & E. L. da Silva 1477* (IAC, SP, SPF, UEC); Queluz, ca. de 9 km ao norte de Queluz, beira do Rio das Cruzes. 22°27'20''S 44°46'54''W, 7.IV.1995, *I. Koch & R. Goldenberg 232* (IAC, SP, UEC); São Paulo, Serra da Cantareira, região do Pinheirinho, 3.V.1990, *R. Esteves 12* (SPSF 13831); São Paulo, Serra da Cantareira, região do Pinheirinho, 10.III.1988, *J. A. Pastore 214* (SPF, SPSF 11952).

Distribution and habitat. – *Dendropanax nebulosus* has a patchy distribution in high-altitude areas near the coast of São Paulo state, such as the Bocaina mountain range, near the border with Rio de Janeiro state, the "Serra da Cantareira", in the northern portion of the municipality of São Paulo, and the Mantiqueira mountain range.

Phenology. – This species has been collected with flowers from March to May. Fruiting material unknown.

Etymology. – The epithet makes reference to the montane forests in which this species occurs, which are locally called "florestas nebulares".

Note. – *Dendropanax nebulosus* appears to be related to both *D. denticulatus* and *D. langsdorfii*, sharing with them leaves with small reddish schizogenous dots visible on the abaxial surface of leaf blades, compound inflorescences with secondary axes usually bearing a bracteate articulation in the proximal half, and flowers with petals strongly reflexed (when fully developed).

This new species can be distinguished from *D. denticulatus* by its leaves with entire or sub-entire margins (vs. margins slightly crenulate), lanceolate to narrow elliptic blades (vs. trullate to widely trullate), and flowers with shorter pedicels (up to 7 mm vs. 10-16 mm long) and shorter petals (ca. 1.8 x 1 mm vs. 2.8-2.9 x 1.7-1.9 mm) and stamens (filaments: ca. 2 mm vs. ca. 3.2 mm; anthers: 0.7-1 x 0.5-0.8 mm vs. 1.6-1.8 x 1.1-1.3 mm). It can be distinguished from *D. langsdorfii* by the acrodromous, suprabasal, imperfect venation lacking conspicuous tertiary and quaternary veins (vs. venation with basal pair of secondary veins similar to other pairs and tertiary and quaternary veins clearly distinct); and inflorescences with more delicate, thinner primary branches (up to ca. 0.5 mm vs. ca. 1 mm wide).

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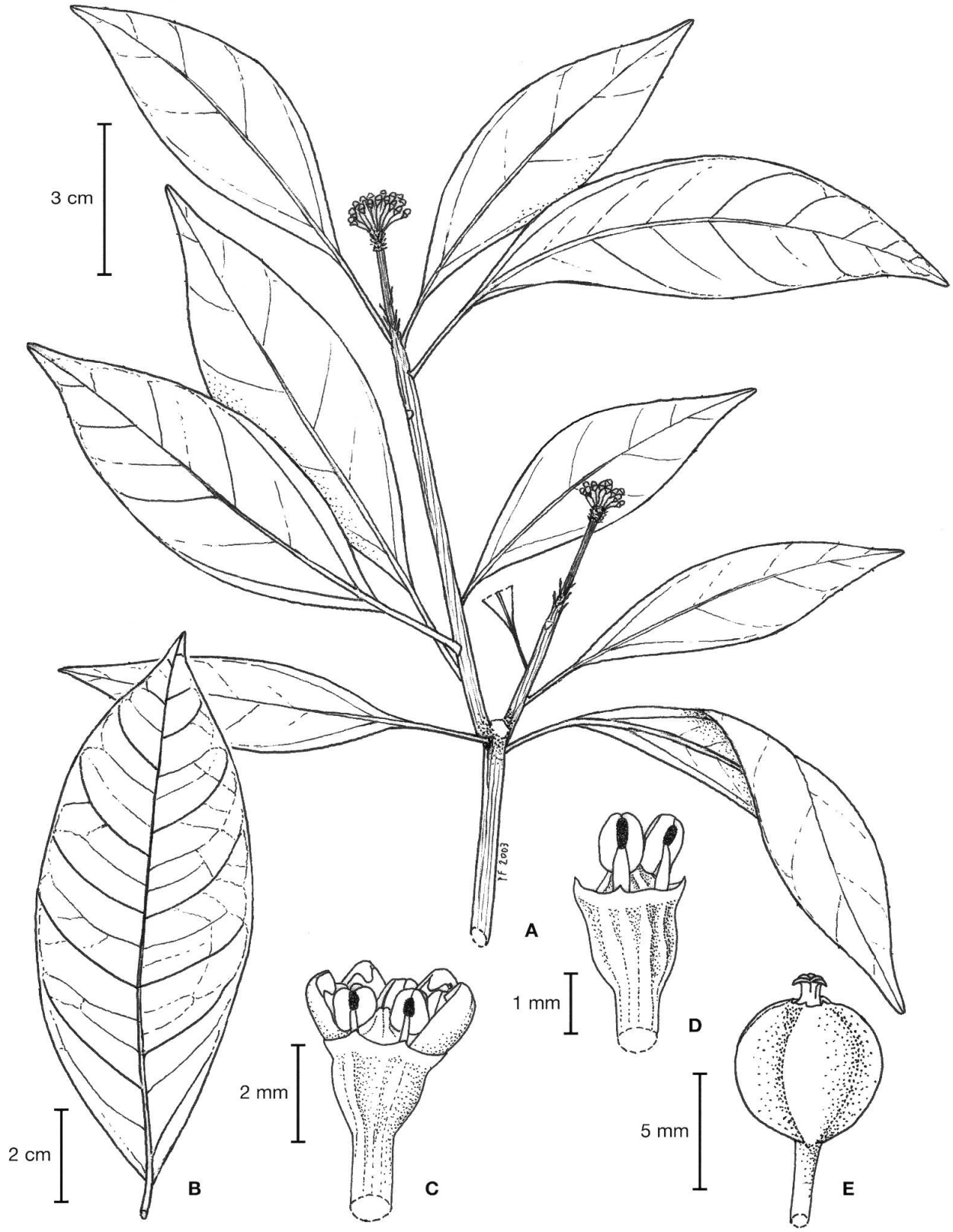

Fig. 1. – *Dendropanax australis* Fiaschi & Jung-Mendaçolli. **A.** Flowering branch; **B.** Leaf undersurface; **C.** Floral bud; **D.** Flower with one petal removed, **E.** Fruit.

[**A:** *W. M. Ferreira & al. UEC14573;* **B-D:** *H. F. Leitão-Filho & al. 33538;* **E:** *M. Kirizawa & M. Sugiyama 2036*] (drawing by Pedro Fiaschi)

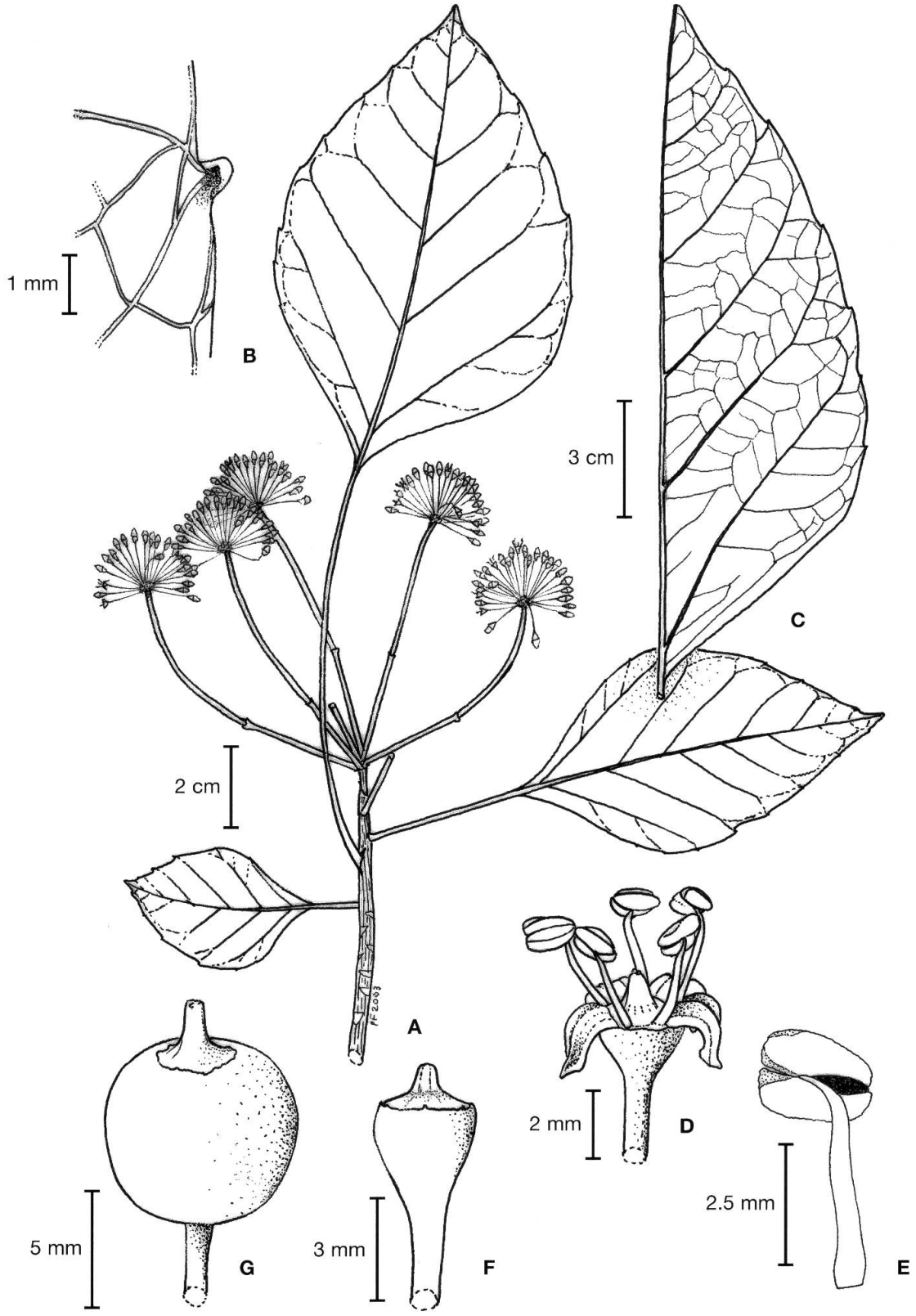

Fig. 2. – *Dendropanax denticulatus* Fiaschi. **A.** Flowering branch; **B.** Detail of a denticule on leaf margin; **C.** Leaf undersurface; **D.** Flower with one petal removed; **E.** Stamen, adaxial view; **F.** Flower, petals and stamens removed; **G.** Fruit. [*P. Fiaschi & al. 1252*] (drawing by Pedro Fiaschi)

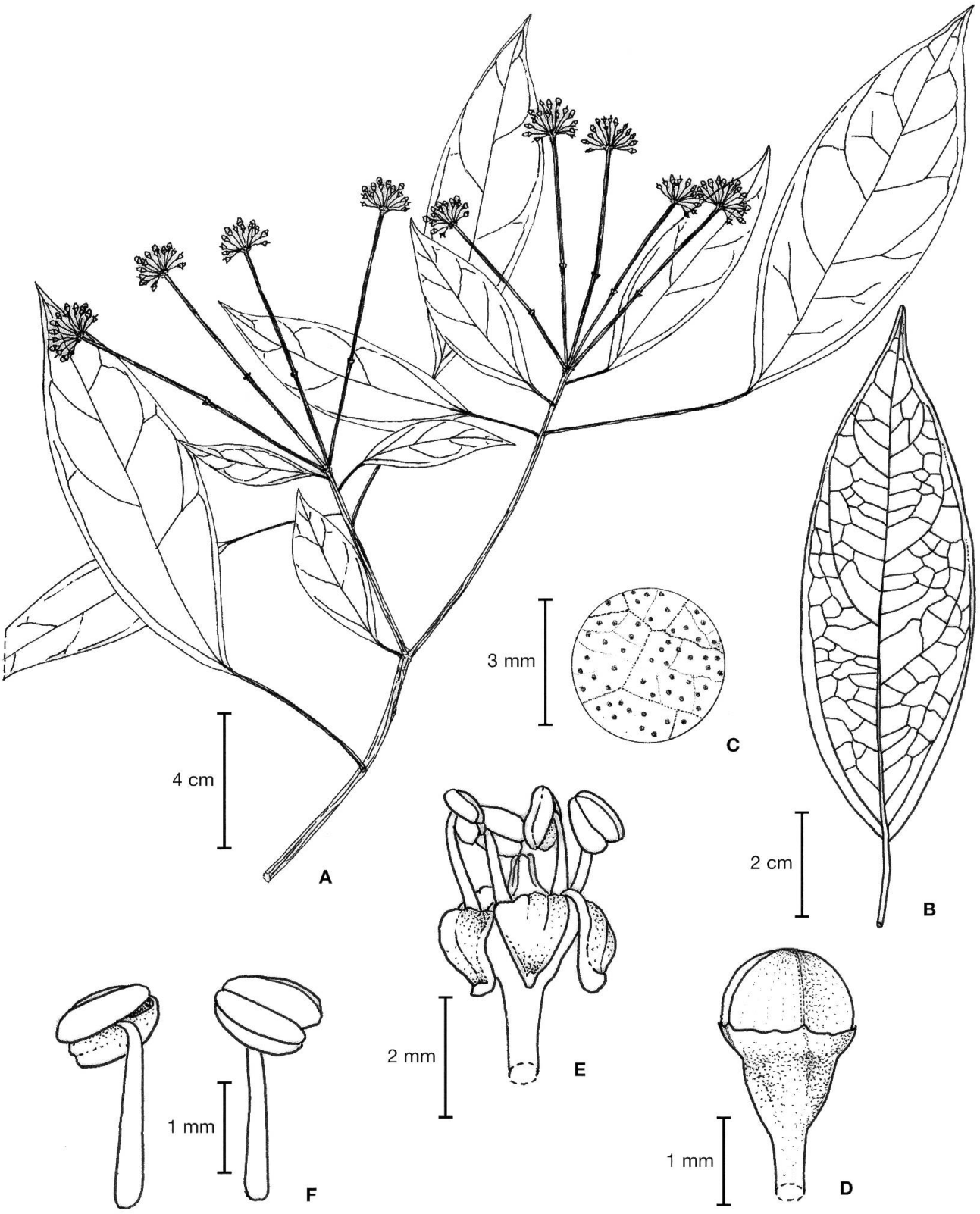

Fig. 3. – *Dendropanax nebulosus* Fiaschi & Jung-Mendaçolli. **A.** Flowering branch; **B.** Leaf; **C.** Detail of the lower surface of leaf blade; **D.** Floral bud; **E.** Flower; **F.** Stamen, abaxial and adaxial view.

[**A-B:** *O. T. Aguiar 407;* **C-D:** *L. Rossi & al. 1477;* **E-F:** *I. Koch & R. Goldenberg 232*] (drawing by Pedro Fiaschi)