A new species of *Decarydendron* (Monimiaceae) from Madagascar

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ABSTRACT
Decarydendron ranomafanensis Lorence & Razafimandimbison (Monimiaceae) from Madagascar is described and illustrated and its relationships and affinities are discussed. A key to the genus *Decarydendron* is presented.

MOTS CLÉS
Decarydendron,
Monimiaceae,
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RÉSUMÉ
Une nouvelle espèce de Decarydendron (Monimiaceae) de Madagascar.
Decarydendron ranomafanensis Lorence & Razafimandimbison (Monimiaceae) de Madagascar est décrit et illustré. Ses relations et affinités sont discutées. Une clé des espèces de *Decarydendron* est présentée.

Decarydendron Danguy (Monimiaceae, subfamily Monimioideae) is a peculiar genus comprising three species endemic to Madagascar (LORENCE 1985). Named for the French botanical explorer R. DECARY, the genus was described by DANGUY (1928) based on the single species *D. helenae* Danguy. CAVACO (1958a, 1958b) subsequently described two additional species, *D. perrieri* Cavaco and *D. lamii* Cavaco, as well as *D. helenae* var. *stenophyllum* Cavaco in preparation for his treatment for the *Flore de Madagascar et des Comores* (CAVACO 1959).

Members of the genus are poorly known and uncommonly collected monoecious shrubs or small trees restricted to lowland and montane moist and wet forest communities of eastern Madagascar. The green, yellow, or purple shallowly cuplike staminate flowers are solitary on leafy branches, or are produced along the trunk or near the ground on the swollen trunk base in sexually

mixed racemes that usually bear a terminal female flower. The female flowers are obconical to turbinate with numerous carpels lining the receptacle, ranging in number from c. 300 to an estimated 6,000 in this new species! Fruiting material remained unknown until fruits of a collection made in 1984 were described for *D. perrieri* (LORENCE 1987). The massive fruiting receptacles covered with numerous free carpels are produced on the trunk near (or even below!) ground level, suggesting the ripe carpels may be adapted for dispersal by terrestrial birds or other organisms.

Decarydendron possesses the greatest constellation of unspecialized characters of any of the Malagasy Monimiaceae genera (LORENCE 1985). These include the broad, shallowly concave floral receptacles with many large, whorled imbricated tepals, obconical female flowers with numerous free, clavate carpels, and cuplike male flowers that expand gradually without splitting into segments as in the other genera.

During the course of identifying Malagasy Monimiaceae specimens housed at the Missouri Botanical Garden Herbarium (MO), we studied ample material of a fourth species of *Decarydendron* first collected in and around the Ranomafana National Park. Field work and additional collections and observations made by the second author confirm that it represents a new species, which is described and illustrated below. A key to the genus is presented to facilitate identification.

Key to *Decarydendron*

1. Leaves with lamina glabrous on both surfaces, 3-10 × 0.8-5.1 cm, margins entire or with 1-4 pairs of teeth ..... **D. ranomafanensis**
1'. Leaves with lamina abaxially hirsutulous, strigillose, or velutinous, rarely glabrate, adaxially glabrate or sparsely puberulent, 8-20 × 3.5-13 cm, margins with 15-50 pairs of teeth. 2
2. Leaves with lamina abaxially velutinous; petioles 3-5 mm long; tepals of staminate flowers crenulate ..... **D. perrieri**
2'. Leaves with lamina abaxially hirsutulous or strigillose, rarely glabrate; petioles 10-20 mm long; tepals of staminate flowers entire 3
3. Laminar teeth 2-4 mm long; staminate flowers with 40-60 stamens ..... **D. helenae**
3'. Laminar teeth 0.5 mm long; staminate flowers with 16-30 stamens ..... **D. lamii**

Decarydendron ranomafanensis Lorence & Razafimandimbison, **sp. nov.**

Species Decarydendron lamii Cavaco *affinis, ramunculis petiolisque strigillosis, foliis minoribus, 3-10 × 0.8-5.1 cm, omino glabris, integris vel 1-2(-4) denticulatibus differt.*

TYPUS. — *Schatz 2579*, Madagascar, Prov. Fianarantsoa, 7 km W of Ranomafana, on slopes above Namorona River, the Duke University Primate Center study site, eastern domain, 21°16'S, 47°25'E, 1000 m, 12-13 Feb. 1989 (holo-, MO 3707282; iso-, TAN).

Monoecious shrub or slender tree 6-15 m tall, trunk 8-10 cm d.b.h., bark gray with fine brown fissures, new growth sparsely strigillose with pale simple hairs 0.1-0.2 mm long, mature leafy twigs 1-2 mm diam., soon glabrescent, green. Leaves opposite, petiolate; petioles 4-12 × 0.5-1.2 mm, adaxially canaliculate, glabrate; lamina 3-10 × 0.8-5.1 cm, elliptic, oblong or narrowly oblong, occasionally narrowly lanceolate or narrowly oblanceolate, apex usually acute, obtuse, rounded or retuse, tip often mucronulate, less commonly acute with short-acuminate point 3-7 mm long, base narrowly to broadly cuneate, obtuse, or rounded, glabrous, stiffly chartaceous to coriaceous, both surfaces often lustrous, secondary veins 6-9 pairs, festooned brochidodromous,

venation visible and prominulous to 4° on both surfaces, margin entire or rarely dentate distally with 1-2(-4) pairs of minute teeth c. 0.5 mm long. Staminate flowers solitary, axillary or ramigerous on leafless stems, with pedicel 8-12 mm, sparselly strigillose, bracts few, triangular to oblong, 0.5-2 mm, acute, strigillose, buds 8-12 mm wide, subglobose to broadly obconic, sparsely strigillose, expanding gradually without splitting, at anthesis broadly obconic-cupuliform, 8-12 mm long, 12-20 mm wide, tepals 15-18 in two series, 1.5-4 mm long, 2-3 mm wide basally, narrowly to broadly triangular-oblong, densely yellow villosulous, when fresh receptacle green and glabrate externally, purple internally, tepals light to dark green; stamens 28-32, anthers broadly ellipsoid, 1-1.5 × 0.9-1.5 mm, cream-color when fresh, loculi lateral, separate, filament 0.3-0.5 mm, connective not prolonged. Pistillate flowers apparently solitary or fasiculate, cauliger-ous 10-80 cm above ground, on stout pedicel 15-20 × 3-4 mm, sparsely strigillose, receptacle broadly and irregularly obconical, 10-11 cm wide × 3-3.5 cm deep, external surface green when fresh, glabrate, internal surface covered with c. 6,000 carpels interspersed with short, densely velutinous hairs; carpels 1.5-2 mm long, 0.5-0.8 mm diam., clavate or columnar, apex papil-lose, red-orange when fresh. Mature fruiting receptacle massive, 10-15 cm wide, becoming everted, orange when fresh, covered by c. 13-100+ carpels, pedicel 20 × 8 mm; mature carpels sessile, 22-30 × 12-18 mm, lageniform with beak to 10 mm, surface corky, brown to black when ripe, single-seeded.— Figs. 1, 2.

PARATYPES. — MADAGASCAR: ***Prov. Fianarantsoa,*** Ranomafana, National Park: *Randrianasolo & Bernardin 243,* parcelle 3, S of National Road 25 at 7 km W of Ranomafana town, 21°15'S, 47°25'E, 900-1100 m, 27 Feb. 1995 (MO); *Turk et al. 317,* 950-1150 m, 12 Mar. 1993 (MO, P, PTBG); *Rakoto 405,* parcelle III, près de la case de Recherche, 21°16'S, 47°25'E, 800-1000 m, 19 Jan. 1993 (MO, P); *Malcomber 1079,* trail S from Cabine de Recherche to Vato camp used by primatologists, 21°15'S, 47°27'E, c. 1100 m, 11-15 Nov. 1991 (MO, P, PTBG); *Overdorff 26,* 7 km W of Ranomafana, just S of Namorona River at the Duke University Primate Center study site, 21°16'S, 47°25'E, 1000 m, 27 Oct. 1987 (MO). — ***Prov. Antsiranana:*** Andapa, Réserve Spéciale d'Anjanajaribe-Sud, au sud de campement à Mandritsarahely: *Razafimandimbison et al. SG 233,* 985 m, 10 July 1996 (MO, TAN); *Razafimandimbison & Ravelonarivo SG 379,* 985 m, 3 July 1998 (MO, TAN); *Ravelonarivo et al. 46,* aux environs du sommet, 14°46'15''S, 49°29'00''E, 1116-1424 m, 21 Mar.-7 Apr. 1994 (MO, PTBG); *Rakotomalaza et al. 839,* Réserve Naturelle Intégrale no. 12 de Marojejy, le long d'un affluent de la rivière Manantenina, 11 km NW de village Manantenina, 14°26'00''S, 49°44'30''E, 1150-1300 m, 1 Nov. 1996 (MO); *Miller & Randrianasolo 4574*, along trail to summit of Marojejy Est, N of Mandena, 14°26'S, 49°46'E, 1000-1200 m, 25 Nov. 1989 (MO). — ***Prov. Toamasina:*** *Randrianjanaka & Zafy 252*, Réserve Naturelle Intégrale de Zahamena, Montagne de Rangovalo, Commune de Manakambahiny Est, sous-préfecture d'Ambatondrazaka, 17°40'05''S, 48°45'30''E, 1400 m (MO, P, TAN).

This new species displays considerable variation in leaf size and morphology, but the leaves differ from the other three congeners in being relatively smaller, glabrous, usually lustrous adaxially, with the margins entire or only sparsely denticulate distally with 1-2(-4) pairs of minute teeth c. 0.5 mm long.

LOCAL NAMES. — "*Ambôra*", "*Ambora lahy*", "*Amboralahy*", "*Ambora maitso*", "*Tambonetra madinika*".

DISTRIBUTION AND HABITAT. — *Decarydendron ranomafanensis* is known from the Ranomafana region located in southeastern Madagascar ranging northward to the Zahamena, Anjanaharibe-Sud, and Marojejy Reserves located in northeastern Madagascar. The known collections were all made within these protected areas between c. 900 and 1,400 m elevation. The Ranomafana National Park is located c. 900 km away from the Anjanaharibe-Sud and Marojejy Reserves, yet they harbor similar vegetation types, i.e., montane moist and humid forests between 900 and 1,400 m elevation. These forests are composed of several endemic species of *Tambourissa, Ephippiandra,* and *Decarydendron* (Monimiaceae) as well as *Ocotea* and *Cryptocarya* (Lauraceae), *Breonia*, *Gyrostipula*, *Psychotria* and *Schismatoclada* (all Rubiaceae), *Oncostemum* (Myrsinaceae), and *Cyathea* (Cyatheaceae) (Razafimandimbison, pers. obs.). This species has

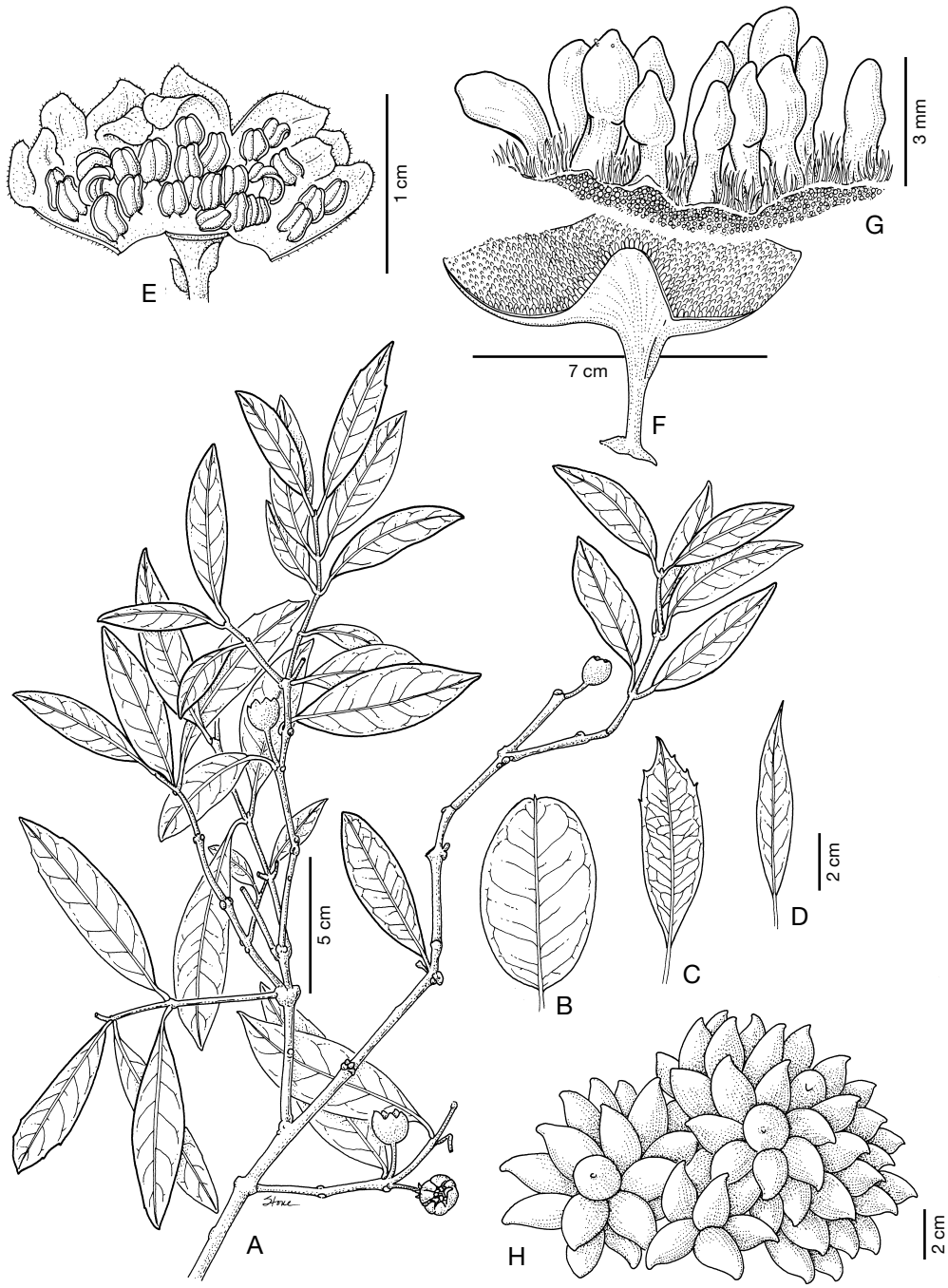

Fig. 1. — ***Decarydendron ranomafanensis*** Lorence & Razafimandimbison: **A**, branch with staminate flowers; **B-D**, leaves, showing variation; **E**, staminate flower opened to show stamens; **F**, pistillate flower with side removed; **G**, detail of carpels interspersed with trichomes; **H**, fruiting receptacle with carpels. (A, E, *Schatz 2579;* B, *Malcomber 1079*; C, D, F, G, *Turk et al. 317*; H, *Razafimandimbison 233*).

Fig. 2. — ***Decarydendron ranomafanensis*** Lorence & Razafimandimbison: Massive fruiting receptacle with numerous carpels. **A**, produced at base of trunk; **B**, held up for scale (both *Razafimandimbison 233*).

been collected in flower in January, February, March, and October and in fruit in July and November.

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REFERENCES

CAVACO A. 1958a. — Sur le genre *Decarydendron* (Monimiacées). *Bull. Soc. Bot. France* 105: 38-39.

CAVACO A. 1958b. — Une espèce nouvelle de *Decarydendron* (Monimiaceae). *Blumea,* Suppl. 4: 28-31.

CAVACO A. 1959. — Monimiacées, in HUMBERT H. (ed.), *Flore de Madagascar et des Comores*, fam. 80. Firmin-Didot et Cie., Paris.

DANGUY P. 1928. — Contribution à l'étude des Monimiacées de Madagascar. *Bull. Mus. Hist. Nat. (Paris)* 34: 278-280.

LORENCE D.H. 1985. — A monograph of the Monimiaceae (Laurales) in the Malagasy region (Southwest Indian Ocean). *Ann. Missouri Bot. Gard.* 72: 1-165.

LORENCE D.H. 1987. — The fruits of *Decarydendron* (Monimiaceae). *Ann. Missouri Bot. Gard.* 74: 445-446.

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