



Compsonaura nallarettiana (Myristicaceae), a new species from north-western Peru

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Myristicaceae (Magnoliales, APG IV 2016) comprise 21 genera with more than 500 species of trees, shrubs and, rarely, climbers. Although the family has a broad pantropical distribution, most species are found in lowland tropical rainforests. In the Neotropics, 83 species of Myristicaceae have been described in five genera (Ribeiro *et al.* 1999): *Compsonaura* Warburg (1896: 84, 94), *Iryanthera* (De Candolle, 1856: 201) Warburg (1897: 126), *Osteophloeum* Warburg (1897: 127, 162), *Otoba* (De Candolle 1855: 22) Karst (1882: 578) and *Virola* Aublet (1775: 904). In the Amazon basin, it is a hyperdominant group (ter Steege *et al.* 2013, Cardoso *et al.* 2017), ranking among the ten most diverse and ecologically important tree families (Gentry 1982, 1988, Pascal & Pelissier 1996, Poulsen *et al.* 1996, Spichiger *et al.* 1996).

Compsonaura was first collected by Richard Spruce, along the Río Negro in Brazil (1852) (Spruce 1908). De Candolle (1856) identified these samples as *Myristica sprucei* De Candolle (1856: 199) and included them in a new section of *Myristica* sect. *Compsonaura* Warburg (1896: 84, 94). Spruce (in De Candolle 1857) described *M. debilis* from specimens collected in 1852 and 1853, and Poeppig (in De Candolle 1857: 697) described *M. capitellata*. Warburg (1895, corrected in 1897) elevated *M.* section *Compsonaura* to genus based on *M. debilis* and transferred *M. capitellata* and *M. sprucei* to *Compsonaura*. He also described a new species, *C. trianae* Warburg (1897: 147).

As presently circumscribed, *Compsonaura* comprises 23 names, of which just 17 are accepted (www.tropicos.org). The genus consists of medium to large trees, distributed from south-eastern Mexico, through Central America and into north-western South America at elevations from sea level to 2000 m. (Jaramillo & Balslev 2002). It is recognised by its conspicuous, subparallel tertiary leaf venation, in which third-order veins run almost perpendicular to the secondary veins and bend toward the primary vein (Vásquez 1997). To date, only three species of *Compsonaura* are known from Peru (Janovec 2002, Vásquez 1997): *C. capitellata*, *Compsonaura diazii* Janovec (2002: 366) and *C. sprucei* (A.D.C.) Warburg (1897: 143). A fourth species is formally described below, based on the taxonomic revisions of herbarium collections and field observations.

Specimens of the new species were collected in permanent forest plots and during a biological inventory carried out in the Cordillera Escalera Regional Conservation Area, Department of San Martín. We assessed the conservation status of the new species by calculating its extent of occurrence (EOO) and its area of occupancy (AOO) using the GeoCAT tool (Bachman *et al.* 2011) based on the IUCN Red List Categories and Criteria (IUCN 2022).

For the detailed study of reproductive organs and to provide material for illustration, flowers and fruits were fixed in a solution of alcohol, water and glycerin. Description is based on morphological characters observed on the specimens with and without use of a microscope.

Taxonomy

Compsonaura nallarettiana M.Ríos, R.Zárate & J.Grandez, *sp. nov.* (Fig. 1)

Type:—PERU. San Martín: Área de Conservación Regional Cordillera Escalera, km 20 carretera Tarapoto-Yurimaguas, Centro Académico, Investigación y Ecoturismo “Biodiversidad”, a 7.4 km al SSW de Tarapoto, bosque de tierra firme. 734 m, -6.469775, -76.2951175, 19 May 2017, Flores & Vásquez 803 (holotype: HH!; isotype: HOXA!).

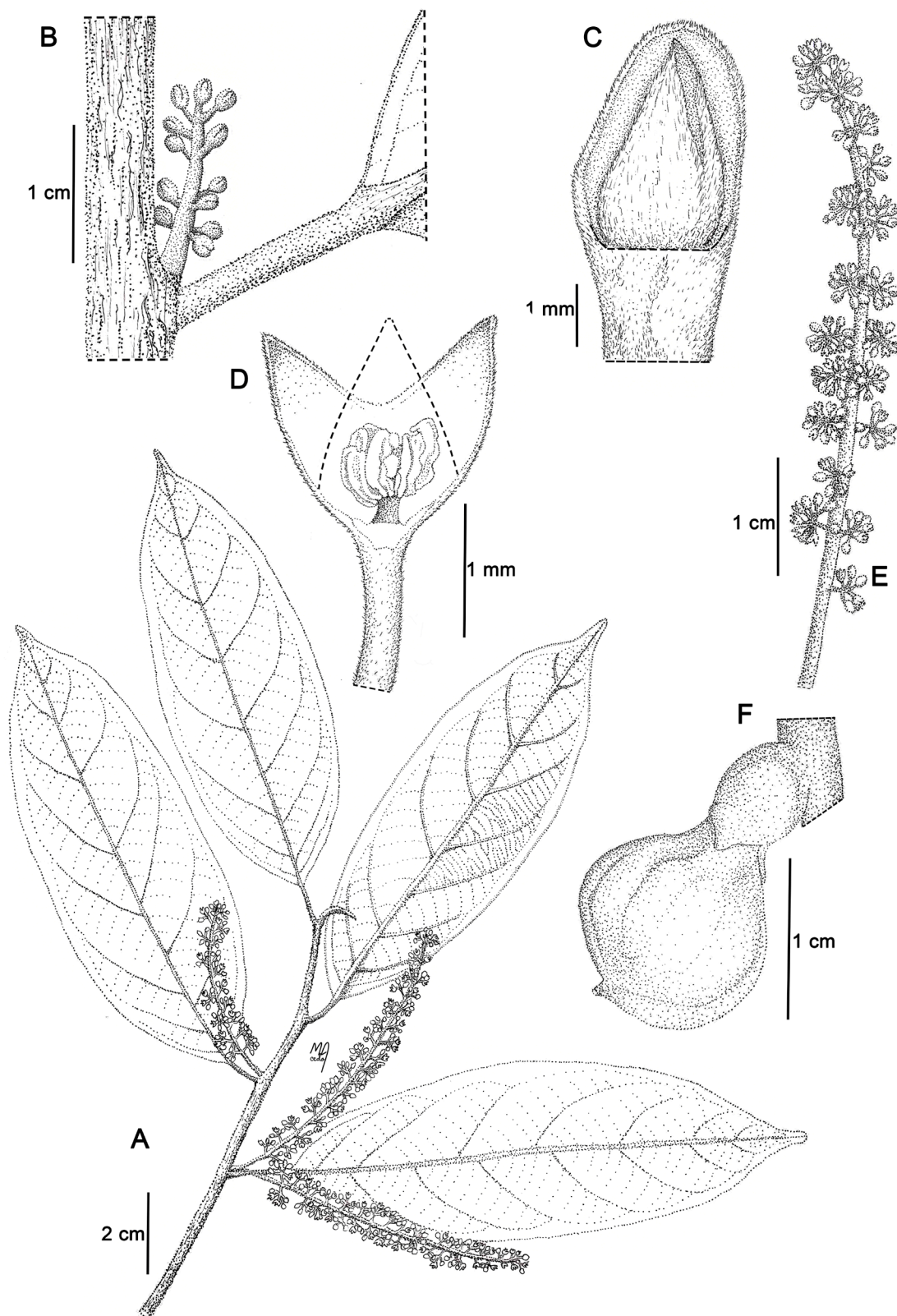


FIGURE 1. *Compsonera nallarettiana*. A. Habit with axillary staminate inflorescence. B. Axillary pistillate inflorescence. C. Pistillate flower with ovary. D. Staminate flower with androecium. E. Staminate inflorescence. F. Immature fruit.

The new species is similar to *C. diazii* but differs from the latter in its weakly brochidodromous secondary veins with leaf apex acuminate to brevi-acuminate and sessile fruit vs. brochidodromous secondary veins, an acute to caudate apex and pedunculate fruit.

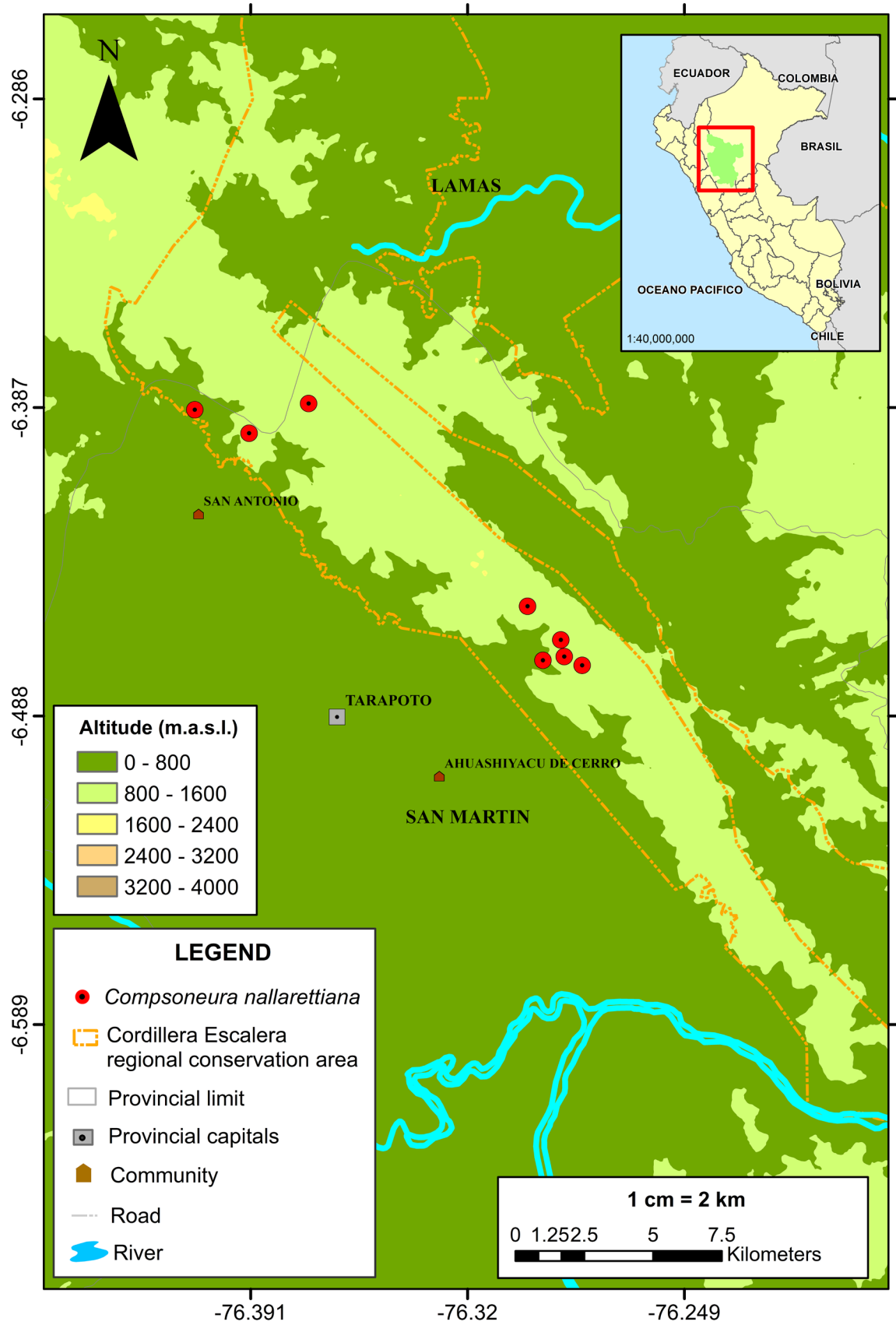


FIGURE 2. Distribution of *Compsonera nallarettiana* in north-western Peru.

Dioecious trees 10–25 m tall, 10–43 cm dbh, the inner bark exuding profuse reddish sap, branchlets terete to subterete, 0.19–0.33 cm diameter, rigid, longitudinally striate, drying dark brown. Leaves simple, alternate, distichous,

petiole subterete, canaliculate, 0.70–1.60 × 0.10–0.22 cm, rugose, drying dark brown; *blades* elliptic to obovate-elliptic, 7–16 × 3–6 cm, adaxially drying dark brown, glossy to semi-glossy, glabrous, sometimes with black dots (observed at 30 × magnification), abaxially drying dull brown, glabrous, sometimes with black dots, base acute to attenuate or subobtusate, margins revolute, apex acuminate to brevi-acuminate, acumen 0.43–1.91 cm long; middle vein emergent, glabrous adaxially, brochidodromous secondary veins weak, 4–13 per side, arcuate-ascending, anastomosing near margins, shallowly impressed adaxially, prominent abaxially, 0.8–2.5 cm apart, tertiary veins conspicuous, semiparallel to the middle vein and secondary veins. Staminate inflorescences axillary, 1–3 fasciculate, once-paniculate, (5.5–) 6.5–10.4 × (2.0–) 3.0–5.5 (–7.3) cm, densely ferruginous-tomentose, the hairs 2-branched; rachis alternately branched, the branchlets 8–24, the flowers arranged in clusters of about 2–8 per branchlet; pedicels slender, pubescent, (0.063–) 0.100–0.130 × 0.035–0.050 cm. Pistillate inflorescences axillary, once-paniculate, 0.7–0.8 × 0.8–0.9 cm, densely ferruginous-tomentose, sericeous or both, hairs 2-branched; rachis with 7–11 alternate branches, flowers subsessile and arranged in clusters of about 1–2 (–4) per inflorescence branchlet; pedicels slender, pubescent, 0.10–0.13 × 0.05–0.10 cm. Staminate flower buds orbicular to ovate or oval, 0.11–0.17 × 0.09–0.16 cm. Pistillate flower buds orbicular to oval, 0.20–0.23 × 0.14–0.22 cm. Perianth of staminate flowers short-tubular, 0.12–0.18 × 0.09–0.17 cm, drying brown to dark brown with golden indument, thinly pubescent adaxially, glabrescent to ferruginous-tomentellous to tomentose abaxially, the hairs short-stalked to sessile, 2-branched, the tube 0.028–0.088 cm long, the lobes (2–) 3–4 (–6), narrowly ovate to lanceolate-ovate to narrowly deltoid with acute apex, 0.07–0.12 cm × 0.06–0.13 cm wide at base; androecium 0.05–0.12 cm long, the filament of 0.019–0.052 × 0.012–0.032 cm, the anthers 4–6 (–7), subequal to the androphore, free, recurved, 0.03–0.08 cm long. Perianth of pistillate flowers subsessile, ovate to elongate-ovate, 0.20–0.23 × 0.14–0.22 cm, drying brown to dark brown, thinly pubescent adaxially, densely to sparsely ferruginous-tomentellous to ferruginous-tomentose abaxially, the hairs 2-branched, the tube 0.09–0.12 cm long, the lobes 3 (4), ovate, 0.10–0.11 × 0.11–0.14 cm; ovary ovate with acute apex, 0.08–0.15 × 0.04–0.11 cm, drying brown, densely ferruginous-tomentose with golden indument; stigma bilobate, brown to dark brown when dry. Immature fruits sessile with 1 to 4 per infructescence, ovate, 28–30 × 21–23 mm, sulcate, light brown when fresh and ferruginous-tomentose, apex minutely acuminate, base truncate, mature fruits not observed.

Distribution and ecology:—Sandy substrates in terra firme forests, 500–1300 m, Department of San Martin in north-western Peru (Fig. 2).

Phenology:—Flowering in May, fruiting in August.

Etymology:—Dedicated to Nállarett Marina Dávila Cardozo, known to her friends as Gigi in recognition of her commitment to the study and conservation of tropical biodiversity in Peru, Brazil, Colombia, Ecuador and Venezuela, which will be an inspiration to coming generations.

Conservation status:—Following the IUCN Red List Criteria (IUCN 2022), this new species is proposed as critically endangered (CR). The extent of occurrence (EOO) is calculated to be 27 km² (criterion B1 < 100 km², critically endangered) and the area of occupancy (AOO), 24 km² (criterion B2 < 500 km², endangered). This species is partially protected because the population lies within in the Cordillera Escalera Regional Conservation Area.

Additional specimens examined:—PERU. San Martin: San Martin, Banda de Shilcayo, Centro Académico, Investigación y Ecoturismo Biodiversidad, -6.469775, -76.2951175, 734 m.a.s.l., 19 May 2017, Flores & Vásquez 533, 539, 652, 699, 781, 803, 843, 987, 994, 1000, 1024, 1073 (HH!); San Martin, San Antonio de Cumbaza, Canela Ishpa, -6.3879, -76.4089, 953 m.a.s.l., 3 Aug 2013, Mori *et al.* 2009 (HH!).

Notes:—*Compsonera nallarettiana* differs from other *Compsonera* species in its sessile fruits. With respect to leaves, *C. nallarettiana* resembles *C. cuatrecasasii* Smith (1950: 318), *C. debilis*, *C. diazii* Janovec, *C. excelsa* Smith (1938: 413) and *C. mutisii* Smith (1938: 415), but it can be differentiated by the size of male flowers and inflorescences (Table 1). *Compsonera diazii* and *C. nallarettiana* occur in the Amazon Basin, north-western Peru, with *C. diazii* as far as southern Ecuador, whereas the remaining taxa are reported from Brazil, Colombia, Costa Rica, Venezuela and northern Ecuador. *Compsonera nallarettiana* is differentiated from *C. diazii* by the former having weak brochidodromous secondary veins and an acuminate to brevi-acuminate apex, whereas *C. diazii* has brochidodromous secondary veins and an acute, caudate apex. *Compsonera excelsa* and *C. nallarettiana* have inflorescences from 5.5 to 10.4 cm long, whereas the other species have up to 4.5 cm inflorescence. Furthermore, these species have distinct geography, with *C. excelsa* found only in Costa Rica and *C. nallarettiana* only in Peru (Table 1).

For a better understanding of the diversity in this genus, we recommend further investigation of species distributions and biogeography. For some species, including *C. debilis*, *C. lapidiflora* Jaramillo & Balslev (2002: 561), *C. trianae* and *C. ulei* Warburg in Pilger (1905: 136), additional work is also needed on characteristics of female flowers and fruits.

TABLE 1. Comparison of *Compsoeura nallarettiana* with similar species.

Species	<i>Compsoeura cuatrecasasii</i>	<i>Compsoeura debilis</i>	<i>Compsoeura diazii</i>	<i>Compsoeura excelsa</i>	<i>Compsoeura mutisii</i>	<i>Compsoeura nallarettiana</i>
Leaf base	rounded or broadly obtuse	attenuate	acute	acute to attenuate	acute to attenuate	acute to attenuate
Leaf apex	obtuse or obtusely cuspidate	rounded or obtuse	acute to caudate	acuminate short to cuspidate	acuminate to obtuse	acuminate to brevi-acuminate
Staminate inflorescence length (cm)	1.5–2.5	< 1.5	4.0–4.5	4.0–9.0	2.0	(5.5–) 6.5–10.4
Number of flowers per branch in staminate inflorescences	3–5	5–20	2–6	2–3	3–5	2–8
Staminate flower tube length (cm)	0.120–0.140	0.100	0.900–0.130	No information	No information	0.028–0.088
Androecium length (cm)	0.15	0.10	0.10–0.14	0.12	0.10	0.05–0.12
Anther length (cm)	0.30–0.40	0.06–0.08	0.09–0.12	0.08–0.11	0.05–0.06	0.03–0.08
Fruit	pedunculate	pedunculate	pedunculate	pedunculate	pedunculate	sessile
Distribution	Colombia	Brazil, Colombia and Venezuela	Peru and Ecuador	Costa Rica	Ecuador and Colombia	Peru

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