
Rubiacearum Americanarum Magna Hama Pars III. Five New Species and a New Subspecies of *Coussarea* (Coussareae) from Central America and Colombia

Charlotte M. Taylor

Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A.
charlotte.taylor@mobot.org

ABSTRACT. Descriptions and illustrations are presented for the new species *Coussarea antioquiiana* from northwestern Colombia, *C. brevipedunculata* from Panama, *C. duplex* from eastern Costa Rica, *C. grandifruca* from southwestern Costa Rica, and *C. izabalensis* from Guatemala, and for the new subspecies *C. loftonii* (Dwyer & M. V. Hayden) Dwyer subsp. *occidentalis* from southern Costa Rica. This third subspecies of *C. loftonii* comprises the westernmost populations of this morphologically variable species.

RESUMEN. Aquí se describen y se ilustran las especies nuevas *Coussarea antioquiiana* del noroeste de Colombia, *C. brevipedunculata* de Panamá, *C. duplex* del este de Costa Rica, *C. grandifruca* del sur de Costa Rica y *C. izabalensis* de Guatemala, además la subespecie nueva *C. loftonii* (Dwyer & M. V. Hayden) Dwyer subsp. *occidentalis* del sur de Costa Rica. Esta tercera subespecie de *C. loftonii* incluye las poblaciones más occidentales de esta especie morfológicamente variable.

Key words: Central America, Colombia, *Coussarea*, Coussareae, Mesoamerica, Rubiaceae.

During study of recent collections of *Coussarea* Aublet from Central America and adjacent northwestern Colombia for *Flora Mesoamericana*, the following undescribed taxa were discovered. A summary of the morphology of *Coussarea* has recently been presented (Taylor, 1999). This neotropical genus of about 80 to 95 species is characterized by carnose, indehiscent, spongy, often white fruits with one rather thin-walled seed; the ovaries 1-locular or incompletely 2-locular with one or two basal ovules; flowers that are white, nocturnally fragrant, and usually distylous; salverform corollas with four or occasionally five valvate lobes and stipules that are calyptrate and caducous, or interpetiolar, usually imbricated, caducous to subsistent, and rounded to acute. The genus comprises species with a notable range of inflorescence arrangements: usually terminal but axillary in some species (e.g.,

C. dulcifolia Neill et al.); bracteate or in some species ebracteate (e.g., *C. amplifolia* C. M. Taylor); and with the flowers usually in multiflowered paniculate arrangements but sometimes in few-flowered cymes (e.g., *C. klugii* Steyermark) or involucrate capitula (e.g., *C. cephaloides* C. M. Taylor). Some species of *Coussarea* have markedly resinous vegetative buds (e.g., *C. resinosa* C. M. Taylor), and sometimes the inflorescences and flower buds may be coated with resin at least in young stages of development. The shape of the corolla in bud and the shape and size of the axillary vegetative buds are often informative taxonomically. However, the corolla usually elongates markedly just before anthesis, so corolla size measurements based on flower buds are not reliable indicators of the size of the fully developed corolla.

Coussarea antioquiiana C. M. Taylor, sp. nov.

TYPE: Colombia. Antioquia: municipio de San Luis, Cañón del Río Claro, sector nor-occidental, margen izquierda, 5°53'N, 74°39'W, 330–450 m, 26 Dec. 1983, A. Cogollo 1136 (holotype, JAUM; isotypes, COL-299949, MO-4289420). Figure 1A, B.

Haec species ad *Coussaream cerroazulensem* Dwyer, *C. cuatrecasasii* Standley ex Steyermark et *C. enneantham* Standley accedens, sed ab eis limbo calicino truncato 5–6 mm tantum longo distinguitur.

Shrubs, treelets, or small trees to 12 m tall; stems puberulent to glabrescent. *Leaves* 9–18 × 4–11 cm, elliptic to broadly elliptic, papyraceous, adaxially glabrous except hirtellous on the costa and secondary veins, abaxially strigillose to hirtellous or pilosulous with pubescence denser on costa and secondary veins, base cuneate to obtuse, apex abruptly acuminate with tip 1–2.5 cm long and frequently falcate; secondary veins 6–8 pairs, looping to interconnect at least in distal part of blade, with small, densely hirtellous domatia in their axils, adaxially all venation plane, abaxially costa prominent and secondary veins and higher-order vena-

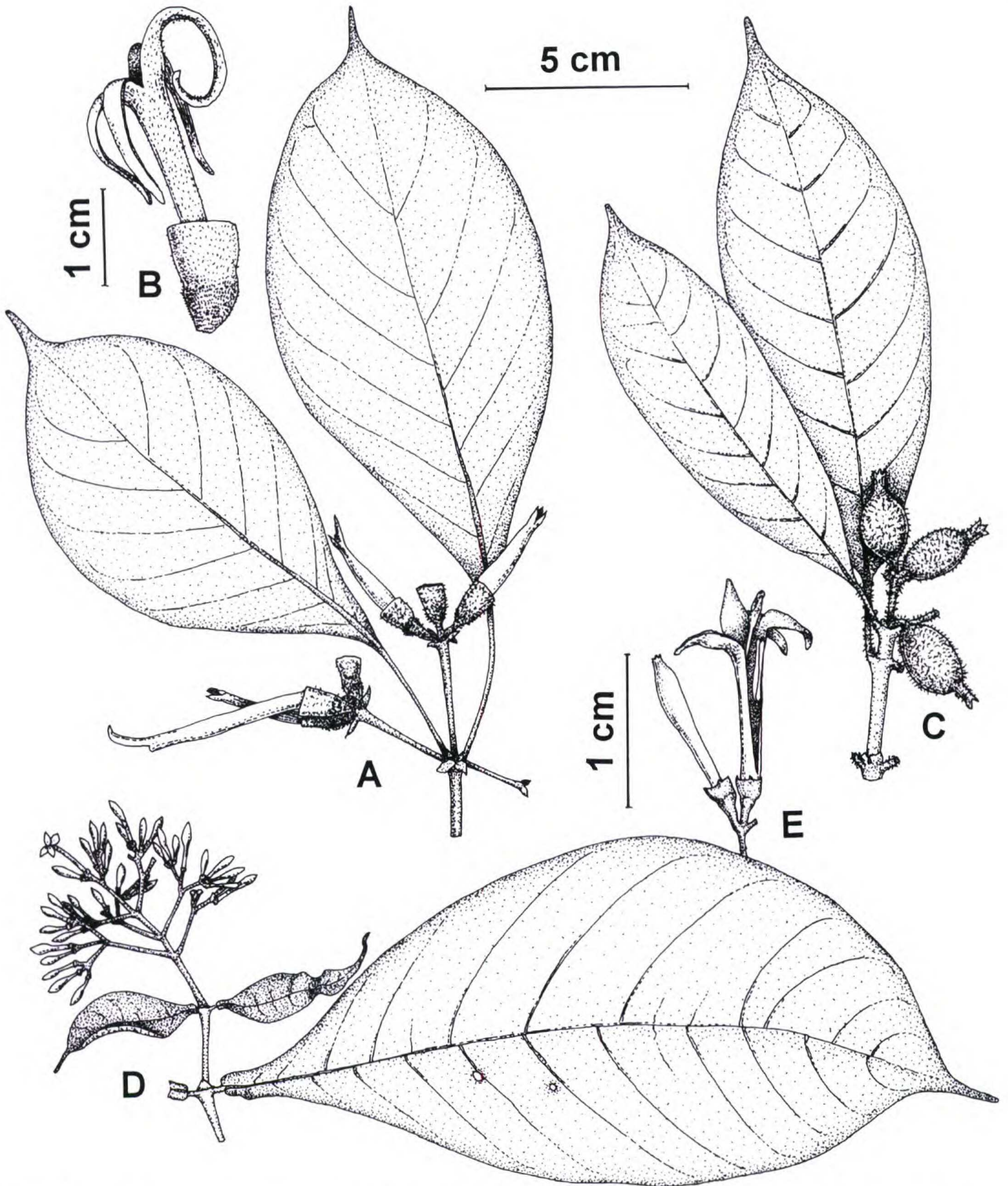


Figure 1. A, B, *Coussarea antioquiiana* C. M. Taylor; based on *Cogollo* 1136.—A. Flowering branch. —B. Mature flower. —C. *Coussarea brevipedunculata* C. M. Taylor, flowering branch; based on *McPherson* 7876. D, E, *Coussarea loftonii* (Dwyer & M. V. Hayden) Dwyer subsp. *occidentalis* C. M. Taylor; based on *Induni* 255.—D. Flowering branch. —E. Detail of inflorescence with a flower bud, and a mature flower partially dissected. A, C, D to 5-cm scale.

tion prominulous; *petioles* 2–5 cm long, pilosulous or hirtellous to glabrescent; *stipules* 4–8 mm long, calyptrate, conical to lanceoloid, apically acute, hirtellous or pilosulous to glabrescent, caducous, after falling off leaving visible a persistent fringe of linear colleters 1–3 mm long; axillary buds 2–6 mm long, narrowly lanceoloid, hirtellous or pilosulous.

Inflorescences terminal, with peduncles 3 or rarely 1, 0.5–1.5 cm long, pilosulous, laterally flattened and usually broadened to apex, each peduncle with 1 to 3 flowers; bracts 2–5 mm long, elliptic to ovate or lanceolate, acute to obtuse, pilosulous. *Flowers* sessile; hypanthium 3–5 mm long, turbinate, densely pilosulous; *calyx* limb 5–6 mm long, trun-

cate, sparsely to moderately pilosulous; *corolla* in bud cylindrical to fusiform with the lobes unequal in length and shortly separating at their apices (at least on dried specimens), at anthesis salverform, white, externally densely pilosulous to strigillose, tube ca. 20 mm long, ca. 4 mm diam. near middle, lobes 4, ca. 23 mm long, narrowly triangular to narrowly ligulate, acute; mature *anthers* and *stigma* not seen. *Fruits* 20–24 × 15–16 mm, ellipsoid, smooth, yellowish to cream white, sparsely to moderately pilosulous, with truncate calyx limb persistent.

Distribution, habitat, and phenology. In wet forest at 330–935 m in northeastern Antioquia Department, Colombia; collected with flowers in April, May, July, October, and December, with fruits in January, March, June, July, and September through December.

This new species is distinguished by its elliptic to broadly elliptic leaves that are strigillose to hirtellous or pilosulous beneath; its calyprate, usually pubescent, caducous stipules; its terminal pilosulous inflorescences with one or usually two or three peduncles, each of which produces one to three flowers; its relatively well developed truncate calyx limb; its relatively long, externally densely pubescent corollas; and its relatively large pubescent fruits. *Coussarea antioquiana* has been previously confused with three other species of *Coussarea* that also have pilosulous to hirtellous pubescence, inflorescences of this form, well-developed calyx limbs, and relatively large fruits: *C. cerroazulensis* Dwyer, *C. cuatrecasasii* Standley ex Steyermark, and *C. enneantha* Standley. *Coussarea cerroazulensis* Dwyer of Panama differs in its stipules that are interpetiolar and shortly intrapetiolar, its lobed, usually longer calyx limbs (6–8 mm long), and its shorter corolla lobes (18–20 mm long). *Coussarea cuatrecasasii* of western coastal Colombia differs in its leaves with 9 to 11 pairs of secondary veins, its stipules that are united in an open tube, and its lobed, longer calyx limbs (12–15 mm long). *Coussarea enneantha* from southern Costa Rica to western coastal Colombia differs in its stipules that are interpetiolar and also shortly united intrapetiolarly, its lobed, usually longer calyx limbs (6–13 mm long), its shorter corolla tubes (ca. 15 mm long) and lobes (14–17 mm long), and its usually smaller fruits (14–25 × 9–10 mm). *Coussarea antioquiana* is so far known only from the Río Claro region of Antioquia Department, Colombia, where it is apparently common. The specific epithet refers to its geographic distribution. The region from which this species comes has been studied by Alvaro Cogollo and his collaborators at HUA and JAUM; all of the

specimens studied of *C. antioquiana* were collected by this project team.

Paratypes. COLOMBIA. **Antioquia:** municipio de San Luis, corregimiento El Prodigio, vereda Las Confusas, 6°03'N, 74°47'W, *Cárdenas et al.* 2551 (JAUM, MO); autopista Medellín–Bogotá, sector Río Samaná–Río Claro, camino hacia la vereda Tulipán, *Cogollo & Estrada* 184 (JAUM, MO); cañón del Río Claro, sector nor-occidental, margen izquierda, 5°53'N, 74°39'W, *Cogollo* 1139 (COL, JAUM, MO), 1265 (COL, JAUM, MO), 1092 (JAUM, MO); carretera hacia El Prodigio, vereda La Independencia, 6°06'N, 74°48'W, *Cogollo & Cárdenas* 3827 (JAUM, MO); carretera de la autopista Medellín–Bogotá hacia el corregimiento El Prodigio, ca. 25 km de la autopista, 6°06'N, 74°48'W, *Cogollo et al.* 4561 (JAUM, MO); autopista Medellín–Bogotá, sector Río Samaná–Río Claro, *Hernández & Hoyos* 70 (COL, HUA, MO), *Hernández et al.* 119 (COL, HUA, MO), 150 (COL, HUA, MO), 206 (COL, HUA), 373 (COL, HUA), 473 (COL, HUA); autopista Medellín–Bogotá, vereda La Josefina, quebrada La Salada, *Hoyos & Hernández* 689 (JAUM, MO); quebrada La Cristalina, Sector SE, 6°N, 74°45'W, *Ramírez & Cárdenas* 144 (COL, JAUM, MO), 364 (COL, JAUM, MO), 517 (COL, JAUM, MO), 845 (COL, JAUM, MO), 920 (COL, JAUM), 1167 (COL, JAUM, MO), 1305 (COL, JAUM, MO), 1556 (COL, JAUM), 1911 (JAUM, MO); San Luis, *Rentería & Cogollo* 2625 (JAUM, MO); Río Claro, carretera al Cairo, margen derecha, *Rentería et al.* 2756 (JAUM, MO); corregimiento El Prodigio, vereda Los Medios, cerro la Cuchilla, *Toro* 93 (JAUM, MO).

Coussarea brevipedunculata C. M. Taylor, sp. nov. TYPE: Panama. Panamá: near Cerro Jefe, along road towards Alto Pacora, 850 m, 9°15'N, 79°30'W, 27 Dec. 1985, *G. McPherson* 7876 (holotype, MO-3618350). Figure 1C.

Haec species *Coussareae enneanthae* Standley similis, sed ab ea infructescentia ex cymula umbelliformi unica pedunculo 1–10 mm longo insidente atque lobulis calycinis in fructu 1–1.5 mm longis distinguitur.

Trees to 8 m tall; stems hirsute with spreading trichomes to 1.5 mm long. *Leaves* 6.5–19 × 2–7 cm, elliptic, chartaceous, adaxially glabrous except hirtellous on costa and secondary veins, abaxially hirsute with the pubescence denser on costa and secondary veins, base cuneate to acute, apex acute to usually acuminate with tip 0.5–1.5 cm long; secondary veins 5 to 10 pairs, looping to interconnect, without domatia, adaxially costa and secondary veins sulcate and higher-order venation plane to prominulous, abaxially costa prominent and secondary veins and higher-order venation prominulous; *petioles* 8–25 mm long, densely hirtellous to hirsute; *stipules* 3–4 mm long, interpetiolar and shortly united intrapetiolarly as well, hirtellous to glabrous, deciduous before leaves, interpetiolar portion deltoid to broadly triangular, obtuse to rounded, resinous; axillary buds 2–3 mm long, ovoid. *Inflorescences* not seen. *Infructescences* with

peduncle 1, 1–10 mm long, hirtellous to hirsute, producing 1 or 3 umbelliform cymules; bracts to 2 mm long, narrowly triangular; pedicels to 2 mm long. *Fruits* 1–3 per peduncle, ca. 17×11 mm, ellipsoid, yellow, smooth, densely hirtellous to hirsute, with persistent calyx limb 5–9 mm long, shortly lobed, the lobes 4, 1–1.5 mm long, ligulate, rounded to obtuse.

Habitat, distribution, and phenology. Wet forest at 800–900 m in central Panama; collected in fruit October through January.

This new species has been confused previously (e.g., Dwyer, 1980) with *Coussarea enneantha* of Panama and northwestern South America, which is generally similar in overall aspect and pubescence. However, *C. enneantha* differs in its 1 to 3 longer peduncles (20–50 mm long), its flowers borne singly or in small glomerules in dichasial cymules, and its longer calyx lobes (2–6 mm long). The specific epithet of this new species refers to its distinctive relatively short peduncles.

Paratypes. PANAMA. **Panamá:** Cerro Jefe along main road before turnoff to summit, *Croat 13052* (MO, SCZ); Cerro Brewster, on San Blas border, $9^{\circ}20'N$, $79^{\circ}15'W$, *McPherson 7546* (MO), *7549* (MO); Cerro Jefe, 1.5 km before weather station, *Sytsma 1516* (MO).

Coussarea duplex C. M. Taylor, sp. nov. TYPE: Costa Rica. Limón: Cantón de Limón, El Progreso, entre Cerro Muchilla y Cerro Avioneta, cabeceras del Río Suruy, Fila Matama, Valle de la Estrella, $9^{\circ}47'25''N$, $83^{\circ}06'30''W$, 550 m, 17 Apr. 1989, *G. Herrera & A. Chacón 2646* (holotype, MO-3844770). Figure 2C.

Haec species *Coussareae talamancanae* Standley similis, sed ab ea stipulis alabastris axillaribus petiolo limbo calycino fructuque omnibus ca. duplo majoribus quam hujus distinguitur.

Small trees to 8 m tall, glabrous. *Leaves* 13.5–31 \times 7–22 cm, broadly elliptic to obovate, chartaceous, base obtuse to rounded, apex shortly acute to acuminate; secondary veins 8 to 10 pairs, occasionally looping to interconnect, without domatia, adaxially costa and secondary veins prominulous and higher-order venation plane, abaxially costa prominent, secondary veins prominulous, and higher-order venation plane to prominulous; *petioles* 25–50 mm long; *stipules* 18–20 mm long, calyptrate, narrowly pyramidal, at apex acute to apiculate, caducous; axillary buds ca. 20 mm long, narrowly conical. *Inflorescences* 8–15 \times 3–4 cm, racemiform, glabrous, ebracteate, unbranched; peduncle 1; pedicels 1.5–2 mm long, borne directly from primary axis, singly or in umbelliform clusters

of 2 to 4. *Flowers* with hypanthium ca. 2 mm long, cylindrical, puberulous; *calyx* limb ca. 3 mm long, infundibuliform, truncate, glabrous, white; *corolla* in bud cylindrical to fusiform, obtuse, externally glabrous, lobes 4, at anthesis not seen; *anthers* and *stigmas* not seen. *Fruits* 25–30 \times 10–12 mm, ellipsoid, laterally somewhat flattened, white, smooth.

Distribution, habitat, and phenology. Wet forests at 200–850 m on the Caribbean slopes of central Costa Rica; collected in flower bud in April and September, in fruit in September.

This new species is distinguished by its relatively large, broadly elliptic to obovate leaves, calyptrate stipules, spiciform inflorescences with the flowers borne directly from the primary axis, well-developed truncate calyx limbs, and laterally somewhat flattened fruits. It is similar to *Coussarea talamancana* Standley; *C. duplex* differs principally in its stipules, axillary buds, petioles, calyx limbs, and fruits all about twice as long as those of *C. talamancana*, and the specific epithet refers to this contrast.

Paratypes. COSTA RICA. **Limón:** Cordillera de Talamanca, ridge separating Quebrada Cañabral from Río Barbilla, and slope leading down to the latter, $10^{\circ}02'N$, $83^{\circ}26'W$, *Grayum et al. 8754* (MO); Cantón de Limón, Cordillera de Talamanca, Cerro Muchilla, Fila Matama, entrando por el pueblo El Progreso, $9^{\circ}47'40''N$, $83^{\circ}06'30''W$, *Robles & Chacón 2748* (MO).

Coussarea grandifruca C. M. Taylor, sp. nov. TYPE: Costa Rica. Puntarenas: Reserva Forestal Golfo Dulce, Osa Peninsula, Rancho Quemado, ca. 15 km W of Rincón, in bottom of valley along Río Riyito near bridge and in forest along road on ridge above valley, $8^{\circ}42'N$, $83^{\circ}33'W$, 250 m, 31 May 1988, *B. Hammel, G. Herrera, M. M. Chavarría & A. Solís 16950* (holotype, MO-3846254). Figure 2A, B.

Haec species *Coussareae psychotrioidi* C. M. Taylor & Hammel similis, sed ab ea limbo calycino longiore distinguitur.

Shrubs, treelets, or trees to 6 m tall, glabrous. *Leaves* 8.5–27 \times 2.6–6 cm, elliptic, papyraceous, base acute to cuneate, apex acute to acuminate; secondary veins 7 to 10 pairs, looping to interconnect, without domatia, on both surfaces costa, secondary veins, and higher-order venation plane to prominulous; *petioles* 5–18 mm long; *stipules* 0.8–1 mm long, united into a tube, truncate, persistent; axillary buds inconspicuous. *Inflorescences* 4–7 \times 2–8 cm, paniculate, in outline rounded-corymbiform to broadly pyramidal, glabrous, with flowers

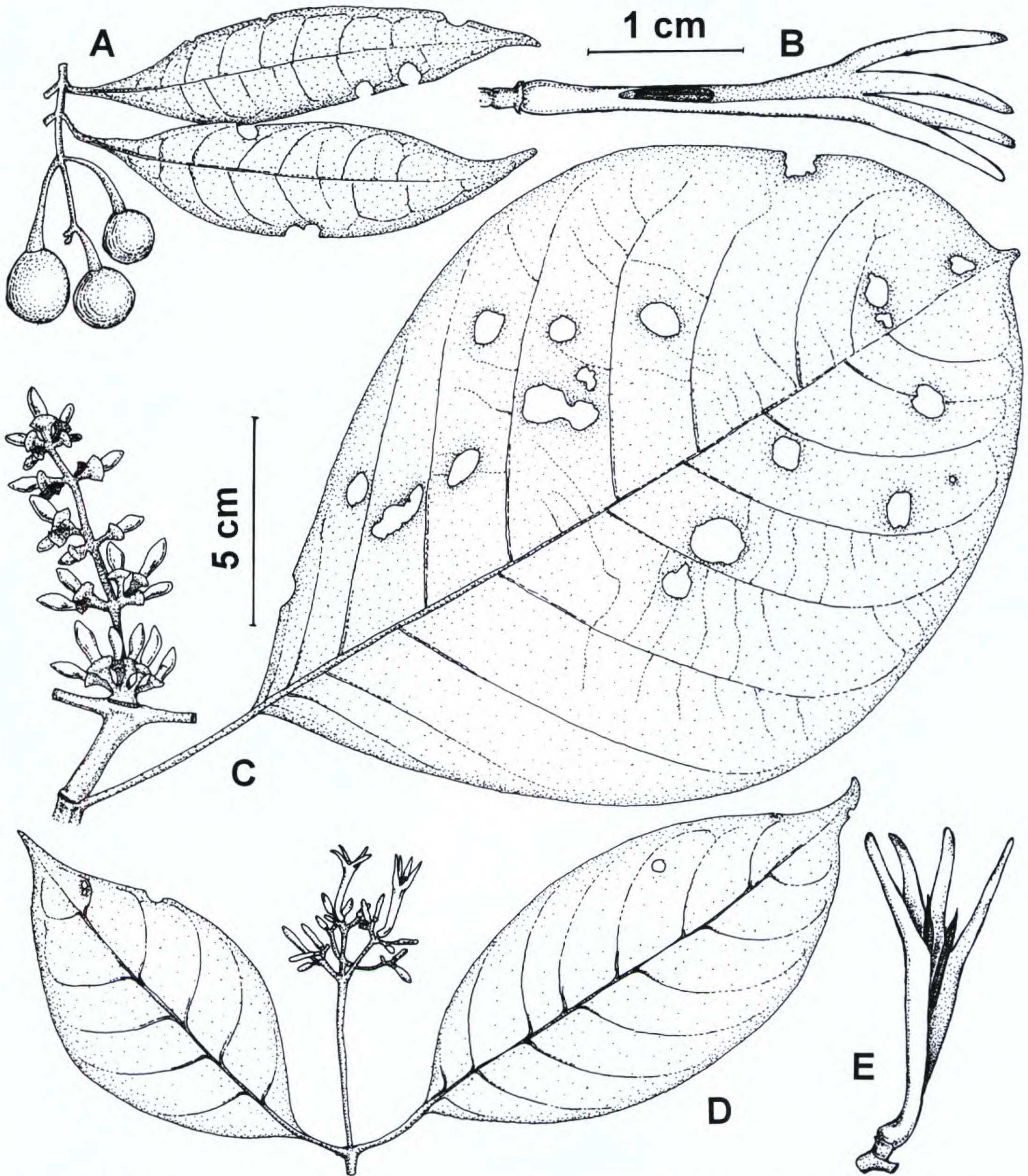


Figure 2. A, B, *Coussarea grandifructa* C. M. Taylor; based on *Liesner 1893*.—A. Fruiting branch. —B. Mature flower, partially dissected. —C. *Coussarea duplex* C. M. Taylor, flowering branch; based on *Herrera 2646*. D, E, *Coussarea izabalensis* C. M. Taylor, based on *Contreras 11354*.—D. Flowering branch. —E. Mature flower, partially dissected.

sessile in dichasial cymules of 3 to 5; peduncle 1; bracts to 3 mm long, linear. *Flowers* with hypanthium 1–1.5 mm long, cylindrical, glabrous; *calyx* limb 0.8–1 mm long, glabrous, truncate except minutely 5-denticulate with teeth widely separated; *corolla* in bud narrowly cylindrical to fusiform, acute to obtuse, at anthesis salverform, white, glabrous externally, tube 13–17 mm long, ca. 1.5 mm diam. near top of tube, lobes 5, 12–16 mm long,

linear to narrowly ligulate, obtuse; *anthers* 4.5–5 mm long, included or partially exerted, apically with a short acute appendage; *stigmas* 2–4 mm long, exerted. *Fruits* ca. 15 mm diam., ellipsoid, blue-black or purple-black, smooth, sometimes shortly stipitate, with infructescence axes usually markedly thickened in their most distal portions.

Distribution, habitat, and phenology. Wet forest

at 20–400 m in the Osa Peninsula of southern Costa Rica; collected in flower April through June, in fruit in January, February, and August.

This new species is distinguished by its persistent stipules united into a short tube, corymbiform-rounded inflorescence, and relatively large fruits borne on infructescence axes that usually become markedly thickened. It is similar to *Coussarea psychotrioides* C. M. Taylor & Hammel of northeastern Costa Rica; however, *C. psychotrioides* differs in its shorter calyx limb (ca. 0.3 mm long) and its ligulate, usually shorter corolla lobes (10–12 mm long). Both of these species have fruits that are relatively large for *Coussarea*; the specific epithet of this new species refers to this feature. With the material available it is not possible to determine if the flowers of this species are distylous or not.

Paratypes. COSTA RICA. **Puntarenas:** Fila before Rancho Quemado, near Rincón, Osa Peninsula, 8°42'N, 83°33'W, *Gentry et al.* 78663 (MO sterile), 78701 (MO); Reserva Forestal Golfo Dulce, Osa Peninsula, Rancho Quemado, ca. 15 km W of Rincón, along road to Drake at N end of valley, 8°44'N, 83°45'W, *Hammel et al.* 17031 (MO); slopes adjacent to airport, Rincón de Osa, *Liesner* 1893 (MO); Golfito, Refugio de Vida Silvestre, valle de Coto Colorado, Fila Gambas, 8°40'10"N, 83°11'50"W, *Martín & Céspedes* 803 (MO), 8°41'N, 83°12'W, *Segura et al.* 82 (CR, MO); Parque Nacional Corcovado, cima de Cerro Rincón, 8°32'N, 83°28'W, *Morales et al.* 19 (INB, MO); Aguabuena, 3 km W of Rincón, 800 m N of the house of Henry Monge, 8°42'N, 83°30'W, *Thomsen* 345 (MO).

Coussarea izabalensis C. M. Taylor, sp. nov.

TYPE: Guatemala. Izabal: El Estor, 17 Mar. 1972, *E. Contreras* 11354 (holotype, MO-4332300). Figure 2D, E.

Haec species *Coussareae psychotrioidi* C. M. Taylor & Hammel similis, sed ab ea stipulis longioribus, lobulis corollinis brevioribus atque fructu minore distinguitur.

Shrubs or small trees to 10 m tall, glabrous. *Leaves* 9–15 × 3.5–6.5 cm, elliptic, papyraceous to chartaceous, base cuneate, apex acuminate with tip 1–2 cm long and often falcate; secondary veins 5 to 7 pairs, sometimes looping to interconnect, without domatia, on both surfaces costa and secondary veins prominulous and higher-order venation plane to prominulous; *petioles* 8–20 mm long; *stipules* 1–3 mm long, united into a tube, truncate to rounded, persistent; axillary buds inconspicuous. *Inflorescences* 3–8 × 3.5–6 cm, paniculate, in outline broadly pyramidal to corymbiform, ebracteate, glabrous, with flowers sessile or subsessile in cymes of 3 to 7; peduncle 1. *Flowers* apparently distylous; hypanthium 0.8–1 mm long, cylindrical, glabrous; *calyx* limb 0.1–0.2 mm long, truncate; *co-*

rolla in bud fusiform, somewhat curved, obtuse, at anthesis salverform, white, externally glabrous, tube ca. 13 mm long, lobes 4 or 5, 8–9 mm long, narrowly triangular, rounded; *anthers* ca. 5.5 mm long and partially exerted, apically with a short acute appendage; *stigmas* ca. 5 mm long with style ca. 7 mm long. *Fruits* ca. 10 mm diam., oblate to subglobose, smooth, mature color unknown; seeds 2.

Distribution, habitat, and phenology. Wet forests of lowland northeastern Guatemala; collected in flower in March, in fruit in July and September.

This new species is distinguished by its persistent stipules united around the stem into a short sheath, broadly pyramidal to corymbiform, ebracteate inflorescences, relatively reduced calyx limbs, slender, white, and often curved corollas. It is similar to *Coussarea psychotrioides* of northeastern Costa Rica and *C. mediocris* Standley & Steyermark of Guatemala. However, *C. psychotrioides* differs in its usually shorter stipules (0.5–1 mm long), its longer corolla lobes (10–12 mm long), and its larger fruits (15–20 × 12–16 mm); while *C. mediocris* differs in its longer hypanthium (ca. 1.5 mm long), longer calyx limb (ca. 0.5 mm long), and shorter corolla tubes (ca. 2.5 mm long). The specific epithet refers to the region in Guatemala where this new species has been collected. Only one floral form has been seen, but the relative positions of the anthers and stigmas are similar to those of short-styled flowers of distylous species of *Coussarea*, so this species may also be distylous.

Paratypes. GUATEMALA. **Izabal:** between Seja and Cienaga, 5 km from Seja, 200 m E of the road, *Contreras* 10198 (MO); Puerto Méndez, on Río Dulce Road, 26 km, *Contreras* 10311 (MO); El Estor, *Contreras* 11399 (MO).

Coussarea loftonii (Dwyer & M. V. Hayden)

Dwyer subsp. ***occidentalis*** C. M. Taylor, subsp. nov. TYPE: Costa Rica. Puntarenas: Parque Nacional Corcovado, Los Planes, La Gloria, 8°37'30"N, 83°40'50"W, 170 m, 17 Feb. 1991, *G. Induni* 255 (holotype, INB; isotype, MO-4602197). Figure 1D, E.

Haec subspecies a subspecie typica foliis obovatis majoribus basi truncatis vel cordulatis, limbo calycino plerumque brevior atque corollae tubo lobulisque brevioribus distinguitur, habitat in regionibus occidentalibus meridionalibusque.

Shrubs or small trees to 7 m tall, glabrous. *Leaves* 14.5–25 × 5–13 cm, obovate to oblanceolate, papyraceous, base truncate to shortly cordate, apex acuminate with tip 1–3 cm long and usually falcate; secondary veins 7 to 11 pairs, weakly looping to interconnect, with pilosulous domatia in axils, on

both surfaces costa and secondary veins prominent and higher-order venation plane to prominent; *petioles* 3–5 mm long; *stipules* 2–3 mm long, interpetiolar and also shortly united intrapetiolarly, deciduous before leaves, interpetiolar portion deltoid; axillary buds inconspicuous. *Inflorescences* 4–7 × 4–7 cm, paniculate, in outline pyramidal, glabrous to puberulous, ebracteate, with the flowers in umbelliform cymules of 2–8; peduncle 1; pedicels 1–1.5 mm long. *Flowers* apparently distylous; hypanthium ca. 1 mm long, ellipsoid to cylindrical, puberulous to glabrous; *calyx* limb 1–2 mm long, glabrous, truncate except shortly 4-denticulate with teeth widely separated; *corolla* in bud fusiform, acute, at anthesis salverform, white, externally glabrous, tube 9.5–10 mm long, ca. 1 mm diam. near middle, lobes 4, 4–5 mm long, narrowly triangular, acute; *anthers* ca. 4.5 mm long, included to partially exerted; *stigmas* ca. 2 mm long, exerted. *Fruits* ca. 12 × 7 mm, ellipsoid, smooth, laterally somewhat flattened, mature color unknown (white in other subspecies).

Distribution, habitat, and phenology. Wet forest at 0–850 m in the Osa Peninsula of southern Costa Rica, also Caribbean slopes from central Costa Rica to western Panama; collected in flower January through March and in May, in fruit in September.

As it is circumscribed here, *Coussarea loftonii* (Dwyer & M. V. Hayden) Dwyer is found from central and southern Costa Rica eastward through Panama, and then south along the Pacific coast of Colombia. Across its range it shows marked morphological variation that seems to be clinal. This species is here considered to comprise three subspecies: subsp. *loftonii*, found in central and eastern Panama; subsp. *calimana* C. M. Taylor, found in the Pacific coastal plain of Colombia (Taylor et al., 1999); and this new subspecies, found from southern and central Costa Rica to western Panama. These three taxa appear at present to be allopatric, and are separated as outlined in the key below.

Morphological variation within *Coussarea loftonii* is particularly marked in the length of the calyx limb, which is longest in Colombian plants and shortest in the Costa Rican plants; in the length of both the corolla tube and the corolla lobes, which are longer in plants of central and eastern Panama than in those of Costa Rica (mature corollas from the Colombian plants have not yet been seen); and in the form of domatia in the vein axils on the leaf undersides. These domatia are glabrous and foveolate (i.e., crypt-type) in Colombian plants; pilo-

sulous and open, with only a low ring of raised peripheral tissue, in plants from central Panama; and pilosulous and completely smooth or with only a very reduced ring of peripheral tissue in Costa Rican plants.

This new subspecies occupies the western part of the range of *Coussarea loftonii*, and its epithet refers to this distribution. *Coussarea loftonii* subsp. *occidentalis* was included by Burger and Taylor (1993) in *C. curvigemma* Dwyer, and has also been confused with *C. impetiolearis* Donnell Smith. However, *C. curvigemma* as circumscribed here is restricted to central Panama and differs from *C. loftonii* in its leaves that are rounded to occasionally truncate at the base, its foveolate domatia that are glabrous to only sparsely pilosulous, its ovoid longer axillary buds (1–3 mm long), and its corollas that are linear to clavate with the apex obtuse in bud, and at anthesis have longer tubes (14–18 mm long) and lobes (7–10 mm long). As circumscribed here *C. impetiolearis* is found on the Caribbean slopes of Nicaragua, Costa Rica, and western Panama, and differs from *C. loftonii* in its quickly caducous stipules, its inflorescences that are cylindrical to rounded in outline, its longer inflorescence bracts (to 1.5 mm long), its inflorescence axes that are pilosulous in lines at the nodes, its corollas that are cylindrical to clavate with the apex obtuse in bud and at anthesis are densely tomentellous to velutinous externally, its longer corolla lobes (6–10 mm long), and its larger fruits (15–20 × 14–15 mm). Only one floral form has been seen, but the relative positions of the anthers and stigmas are similar to those of long-styled flowers of other species of *Coussarea*.

KEY TO THE SUBSPECIES OF *COUSSAREA LOFTONII*

1. Calyx limb 4–5 mm long; fruits ca. 20 × 25 mm; western Colombia subsp. *calimana*
- 1'. Calyx limb 1–3 mm long; fruits 12–15 × 7–10 mm; Costa Rica and Panama.
 2. Leaves 7–15 × 1.7–7 cm, at base narrowly rounded to truncate; petioles 5–30 cm long; calyx limb 2–3 mm long; corollas with tubes 10.5–12 mm long and lobes 6–9 mm long; central and eastern Panama subsp. *loftonii*
 - 2'. Leaves 14.5–25 × 5–13 cm, at base truncate to shortly cordate; petioles 3–5 mm long; calyx limb 1–2 mm long; corollas with tubes 9.5–10 mm long and lobes 4–5 mm long; Costa Rica and western Panama subsp. *occidentalis*

Paratypes. COSTA RICA. **Limón:** 7 km SW of Bribri, L. D. Gómez et al. 20388 (CR, MO). **Puntarenas:** Reserva Forestal Golfo Dulce a 10 km de Chacartia, 8°45'N, 83°18'W, Aguilar 894 (CR, MO); Parque Nacional Cor-

covado, Los Planes (La Gloria), 8°37'N, 83°40'50"W, *Castro 298* (CR, MO); Reserva Indígena Cuaymí, Alto Laguna, Osa, 8°36'40"N, 83°31'20"W, *Cordero 20* (CR, MO), *21* (CR, MO); Reserva Forestal Golfo Dulce, Osa Península, Rancho Quemado, on trail to Drake on ridge at N end of valley, on slope leading down to Guerra, 8°44'N, 83°36'W, *Hammel et al. 16804* (CR, MO); Parque Nacional Corcovado, Llorona, Llorona Trail, *Kernan et al. 970* (CR, MO); Reserva Forestal, Golfo Dulce, Cantón de Osa, Rancho Quemado, ca. 15 km W of Rincón de Osa, along Río Riyito, *Solomon 19297* (CR, MO). PANAMA. **Bocas del Toro:** camino a Quebrada Bonyic, antes de llegar a Quebrada Carbón, *Santamaría & Lara 1042* (MO, PMA).

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