

NEW SPECIES, COMBINATIONS, AND RECORDS IN  
RUBIACEAE FROM THE LA SELVA  
BIOLOGICAL STATION, COSTA RICA

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**ABSTRACT.** The new species *Coussarea nigrescens* C. M. Taylor & Hammel, *Coussarea psychotrioides* C. M. Taylor & Hammel, and *Hillia grayumii* C. M. Taylor are described. The new combinations *Chione sylvicola* (Standley) W. Burger, *Coussarea hondensis* (Standley) C. M. Taylor & W. Burger, *Psychotria camponutans* (Dwyer & Hayden) Hammel, *Psychotria elata* (Swartz) Hammel, and *Psychotria guapilensis* (Standley) Hammel are made. The species *Borojoa panamensis* Dwyer, *Faramea parvibractea* Steyermark, and *Lasianthus panamensis* (Dwyer) Robbrecht are reported from Costa Rica for the first time.

The La Selva Biological Station is situated in wet forest in the Caribbean lowlands of northeastern Costa Rica (Frankie et al., 1974; Hammel & Grayum, 1982; Wilbur, 1986). The following new species descriptions and nomenclatural combinations result from the study of the Rubiaceae for the *Vascular Flora of the La Selva Biological Station* (Wilbur, 1986), and the concurrent study of this family in Costa Rica for the *Flora Costaricensis* and the *Manual Flora of Costa Rica*. Keys, descriptions, and illustrations of the stipules for all species of Rubiaceae found at the La Selva Station will be presented in the *Vascular Flora*. Several other new species of Rubiaceae known from the La Selva Biological Station will be described by Dwyer and Lorence in the *Flora Mesoamericana*.

**New Species**

*Coussarea nigrescens* C. M. Taylor & Hammel,  
sp. nov. FIGURE 1.

Arbor ad 7 m alta, puberula, exsiccata nigra. Folia petiolata oppositaque; laminis ellipticis 8-14 × 3.5-6 cm; stipulis persistentibus, truncatis ad parum bilobatis 1.5-2 mm longis. Inflorescentia rotundata usque pyramidalis 1-2 × 1-2 cm, pedunculo ca. 2 cm longo, flores sessilis glomerulatis, calyce 0.5 mm longo, late lobulato; corolla tubulosa, ubique glabra, tubo 22-24 mm longo, lobis 6-8 mm longis.

**TYPE.** Costa Rica, Heredia. Finca La Selva, the OTS field station near Puerto Viejo de Sarapiquí,

near the junction of the Ríos Puerto Viejo and Sarapiquí, 100 m, 5 Nov 1980, *B. Hammel 10383* (DUKE!, holotype).

Puberulent trees to 7 m tall, drying black. *Leaves* decussate; blades elliptic, 8-20.5 cm long, 3.5-9 cm wide, acute to slightly acuminate at apex, cuneate at base, thinly chartaceous; secondary veins 9-11 pairs, without domatia; petioles 10-35 mm long; stipules interpetiolarly and intrapetiolarly connate, persistent, triangular, 1.5-2 mm long, shallowly bilobed. *Inflorescences* terminal, corymbiform to pyramidal, 1-2 cm long and wide; peduncles ca. 2 cm long; bracts triangular to ovate, 1-3 cm long, caducous; flowers sessile in glomerules of 3-7, bisexual, 5-merous, calyx minutely puberulent, the limb 0.5 mm long, broadly and shallowly lobed; corolla salverform, white, glabrous, the tube 22-24 mm long, the lobes lingulate, 6-8 mm long. *Fruit* globose to ellipsoid, ca. 1 cm in diameter, black; pyrenes 1-2, globose to ellipsoid or planoconvex, smooth.

**ADDITIONAL SPECIMENS EXAMINED.** **Costa Rica.** **HEREDIA:** Cantón de Sarapiquí, 2 km S of Magsaysay Penal Colony, *N. Garwood et al. 1129* (CR). **LIMÓN:** Cantón de Limón, Cerro Muchilla, Fila Matona, 9°46'50"N 83°05'30"W, *R. Robles & A. Chacón 2667* (CR). **PUNTARENAS:** Cantón de Osa, Reserva Forestal Golfo Dulce, Río Tigre, 8°31'40"N 83°26'30"W, *B. Hammel et al. 17851* (CR); Parque Nacional Corcovado, Río Sirena, 8°28'N 83°35'W, *C. Kernan 1328* (CR), 8°31'N 83°31'W, *R. Liesner 3084* (CR). **PUNTARENAS-SAN JOSÉ BORDER REGION:** Tarrazú, faldas de Cerro Nara cerca Esquipulas, 9°29'N 84°03'W, *J. Gómez Laurito et al. 11594* (CR, DUKE, MO, USJ).

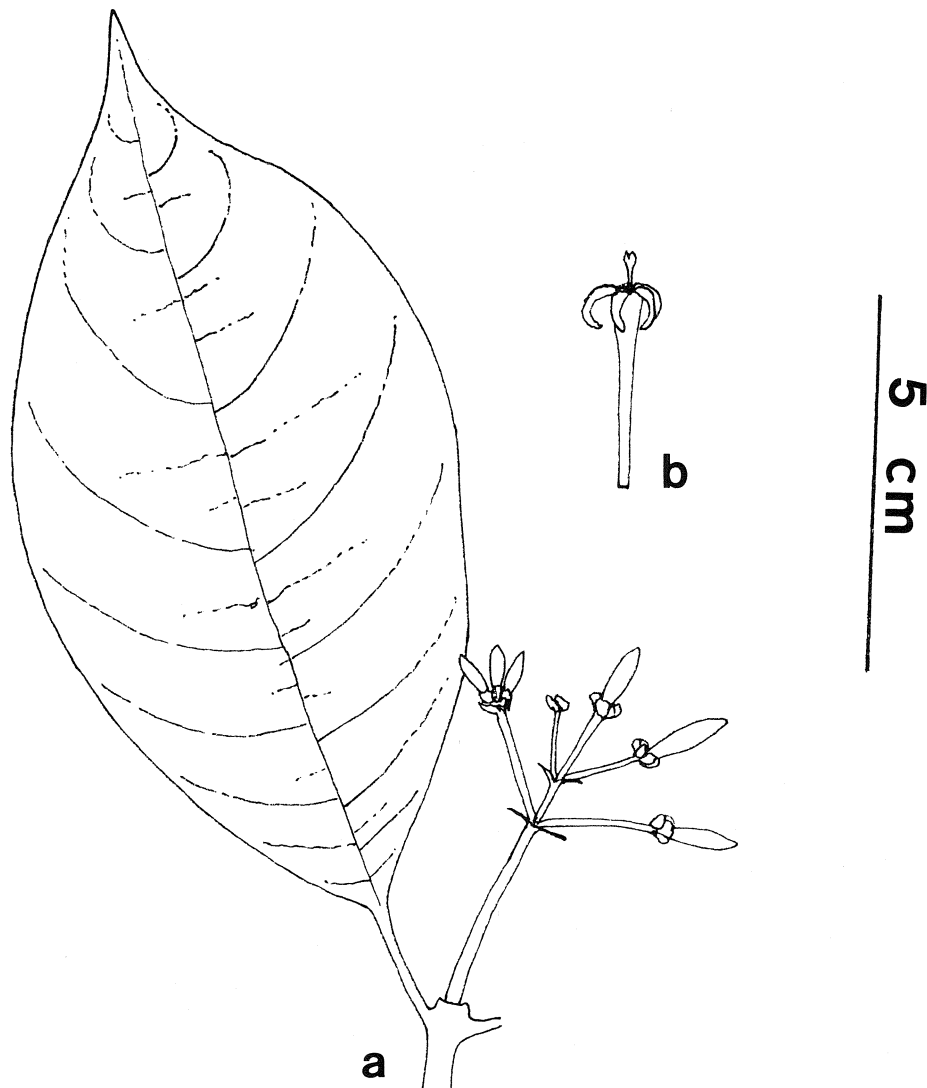


FIGURE 1. A, *Coussarea nigrescens*, habit with inflorescence. B, flower. From Hammel 10383 (DUKE).

**PHENOLOGY.** Collected in flower in April, July and September to November and in young fruit in February.

**HABITAT AND DISTRIBUTION.** Infrequent in wet and moist forest at 20–850 m. Caribbean slopes and the Osa Peninsula of Costa Rica.

**RELATIONSHIPS.** This new species can be separated from other Costa Rican species of *Coussarea* by its leaves, which have a velvety sheen when fresh, and turn black when dried. This dried color is alluded to in the specific epithet. Whether the flowers are distylous or monomorphic is unknown.

***Coussarea psychotrioides*** C. M. Taylor & Hammel, sp. nov. FIGURE 2.

Arbor usque ad 12 m alta, glabrescens. Folia petiolata oppositaque; laminis ellipticis, 8–18 × 2.5–6.5 cm; stipulis persistentibus, truncatis ad parum bilobatis, 0.5–1 mm longis. Inflorescentia rotundata usque pyramidalis, 3–7 × 5–8 cm; pedunculo 1–3 cm longo. Flores sessilis glomerulatis; calyce 0.3 mm longo, subtruncato; corolla hypocrateriformi, ubique glabra, tubo 12–15 mm longo, lobis 10–12 mm longis. Fructus ellipsoideus, 1.5–2 cm longus.

**TYPE.** Costa Rica, Heredia. Finca La Selva, the

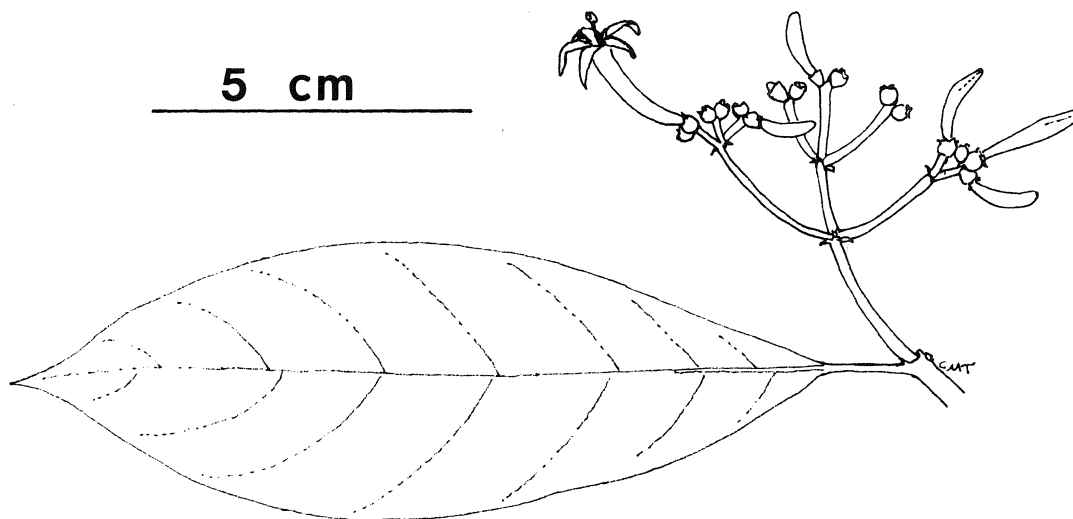


FIGURE 2. *Coussarea psychotrioides*, habit with inflorescence. From *Beach 1416* (DUKE).

OTS field station near Puerto Viejo de Sarapiquí, near the junction of the Ríos Puerto Viejo and Sarapiquí, 100 m, 12 July 1979, *J. H. Beach 1467* (DUKE!, holotype; CR!, F!, MO!, isotypes).

Glabrescent understory trees to 12 m tall. *Leaves* opposite, decussate; blades elliptic, 8–18 cm long, 2.5–6.5 cm wide, acute to slightly acuminate at apex, cuneate at base, chartaceous; secondary veins 7–9 pairs, not looping to interconnect, without domatia; petioles slender, 10–20 mm long; stipules truncate to very slightly bilobed, 0.5–1 mm long, persistent at least on uppermost nodes. *Inflorescences* terminal, corymbiform to panicle-like, rounded to pyramidal, 3–7 cm long, 5–8 cm wide; peduncles 1–3 cm long; bracts triangular, 0.5–3 mm long; flowers sessile in glomerules of 3–7, bisexual, 5-merous, distylous; calyx glabrous, the limb 0.3 mm long, subtruncate, mucronate; corolla salverform to somewhat funnellform, white or often tinged with rose, glabrous throughout, the tube often curved, 12–15 mm long, the lobes ligulate, 10–12 mm long. *Fruit* ellipsoid, 1.5–2 cm long, blue-black; pyrenes 1–2, ellipsoid to planoconvex, smooth or with a slight median sulcus on the inner face.

**ADDITIONAL SPECIMENS EXAMINED.** **Costa Rica.** ALAJUELA: Upala, Bijagua, El Pilón, alrededores intersección del camino de Arguello con Río Chimurria, margen izquierda, 10°43'30"N 85°00'30"W, *G. Herrera 2099* (CR, MO); La Fortuna de San Carlos, *Q. Jiménez 738* (CR, MO). HEREDIA: Finca La Selva, the OTS field station near Puerto Viejo de Sarapiquí, *J. Beach 1336* (DUKE), *1483* (CR, F), *W. Burger & Matta U. 4235* (CR, F), *W. Burger & Stolze 5799* (CR, F), *B. Hammel 9221* (DUKE), *9851* (DUKE), *10621* (DUKE), *G. Hartshorn 1200* (CR, F), *B. Jacobs 2175* (DUKE), *D. Smith 479* (DUKE).

LIMÓN: Río Tercero, *L. Berrocal et al. 79* (CR); por el puente sobre el Chirripó, en la carretera del Río Frio a Guapiles, *L. Poveda 996* (CR, F). PUNTARENAS: Reserva Forestal Golfo Dulce, Osa Peninsula, Rancho Quemado ca. 15 km W of Rincón, *B. Hammel et al. 17031* (CR, MO).

**PHENOLOGY.** Collected in flower in May to July, and in fruit in January, May, September, October, and December.

**HABITAT AND DISTRIBUTION.** Occasional in low or swampy areas of wet lowland forests at ca. 100–900 m, Caribbean slopes and the Osa Peninsula of Costa Rica.

**RELATIONSHIPS.** This new species can be separated from other Costa Rican species of *Coussarea* by its relatively reduced stipules that are persistent on the uppermost several nodes, corymbiform to pyramidal pedunculate inflorescences, rosy white corollas with proportionately long lobes, and relatively large fruits with smooth pyrenes. *Coussarea psychotrioides* can be easily confused with *Psychotria eurycarpa* Standley, which can be distinguished from this new species by its broadly triangular to rounded stipules 1.5–2 mm long, shinier leaves with somewhat more raised tertiary venation, triangular calyx lobes 0.5–1 mm long, pyrenes with well marked angles on the convex back and a distinct longitudinal groove on the flattened inner face, corolla lobes 8 mm long, and March to April flowering period.

The reproductive biology of *Coussarea psychotrioides* is described by Bawa and Beach (1983) under the name "*Coussarea* sp. voucher # JHB 1467" (the type of this new species). The crushed

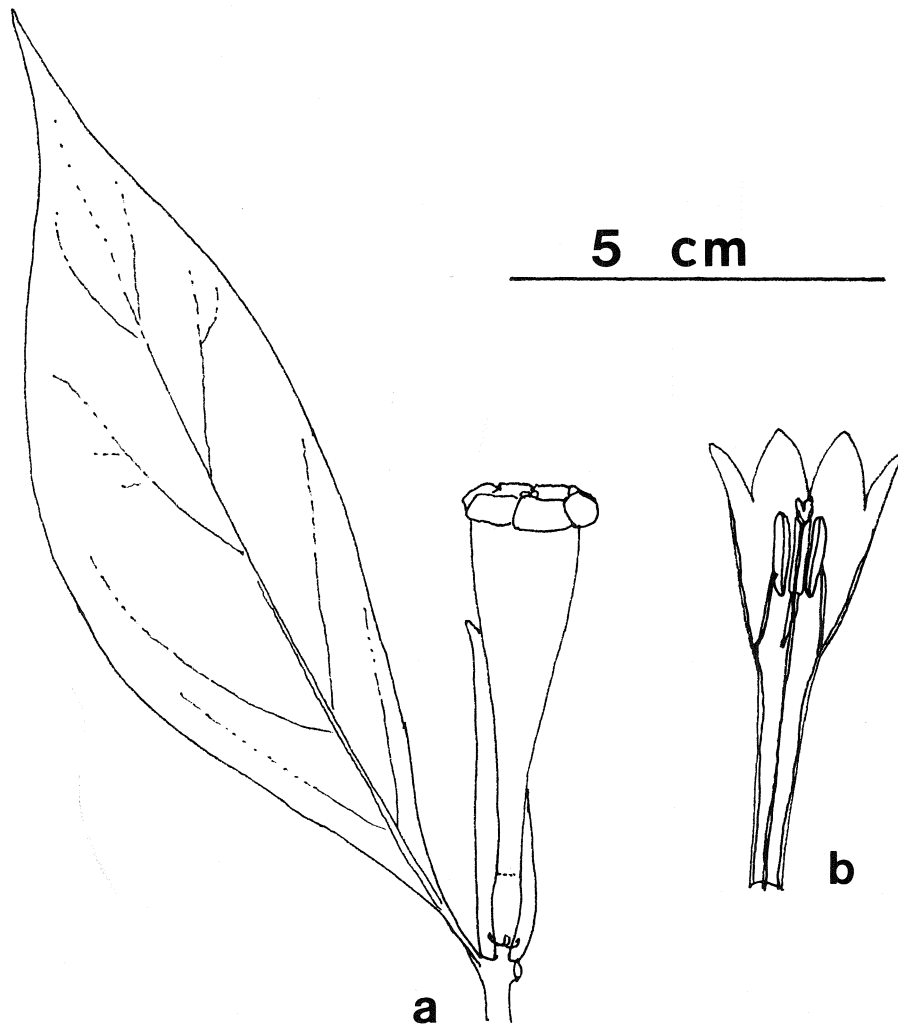


FIGURE 3. A, *Hillia grayumii*, habit with flower. B, flower opened. From Jacobs 2265 (DUKE).

leaves reportedly have a slight fragrance of wintergreen.

***Hillia grayumii*** C. M. Taylor, sp. nov.

FIGURE 3.

Frutex epiphyticus, succulentus, glaber. Folia petiolata isophyllaque laminis ellipticis, 9–16 × 1.5–5 cm, coriaceis; stipulis deciduis, lanceolatis, 4 cm longis. Flores solitarii, 6-meri; lobis calycinis obsolete; corolla infundibulari, pallide viridi ad flava, ubique glabra, tubo 4.3–5 cm longo, lobis 0.8–0.9 cm longis; staminum antheris 9 mm longis, filamentis 1 cm longis, corollae supra basim 3 cm insertis.

TYPE. Costa Rica, Heredia. Finca La Selva, the

OTS field station near Puerto Viejo de Sarapiquí, near the junction of the Ríos Puerto Viejo and Sarapiquí, 100 m, 5 May 1980, M. H. Grayum 2793 (DUKE!; holotype; DUKE!, isotype).

Succulent glabrous epiphytic shrubs to 1 m tall. Leaves isophyllous; blades elliptic, 9–16 cm long, 1.5–5 cm wide, acuminate at apex with tip 1–2 cm long, acute at base, coriaceous; secondary veins 3–4 pairs, pinnate, not prominent, without domatia; petioles 3–20 mm long; stipules caducous, lanceolate, ca. 40 mm long, 6–8 mm wide, acute. Flowers solitary, 6-merous; peduncles 2–3 mm long; bracts triangular, 1–2 mm long, acute; pedicels 2–3 mm long; ovary cylindrical, 7–8 mm long; calyx limb to 0.5 mm long, truncate to very slightly lobed; corolla broadly

funnelform, bright pale green to yellow, the tube 43–50 mm long, the lobes triangular, 8–9 mm long, broadly angled to rounded; filaments ca. 10 mm long, flattened, anthers 9 mm long; style equal to or slightly exceeding corolla, stigmas linear to clavate, 3 mm long. *Capsules* cylindrical, smooth, ca. 10.2 cm long, ca. 8 mm in diameter, with stipe ca. 3 mm long.

**ADDITIONAL SPECIMENS EXAMINED.** **Costa Rica.** CARTAGO: CATIE, Turrialba, Río Reventazón, Sendero los Espaveles, 9°53'N 83°39'W, *B. Hammel et al. 17336* (CR). HEREDIA: Finca La Selva, La Guardia Annex, along the Río Sarapiquí, *B. Jacobs 2265* (DUKE).

**PHENOLOGY.** Collected in flower and fruit in May and June.

**HABITAT AND DISTRIBUTION.** Infrequent in wet forests at 100–600 m, Caribbean slopes of Costa Rica.

**RELATIONSHIPS.** This new species can be distinguished from other Costa Rican *Hillia* species by its bright pale green to yellow, broadly funnelform corollas and reduced truncate calyx limb. It is similar to *H. illustris* (Vellozo) K. Schumann of South America, which can be separated from *H. grayumii* by its calyx lobes 9 mm long or longer and subsessile anthers. This species is named in honor of Michael Grayum, a student of the flora of Costa Rica.

#### New Combinations

*Chione sylvicola* (Standley) W. Burger, comb. nov.

*Chomelia sylvicola* Standley, J. Wash. Acad. Sci. 18: 182. 1928. *Anisomeris sylvicola* (Standley) Standley, N. Amer. Fl. 32: 225. 1934.

*Chione costaricensis* Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 111. 1940.

*Chione allenii* L. O. Williams, Phytologia 25: 462. 1973.

*Chione* in Costa Rica ranges widely in elevation, from near sea level to about 1,800 m. Two species of *Chione* have been recognized previously from Costa Rica, based on variation in leaf and inflorescence size. Plants with relatively small leaves and inflorescences are usually found in montane areas; plants with relatively large leaves and inflorescences are usually found in lowland areas, including the La Selva Biological Station. However, no consistent variation in floral or fruiting features accompanies this variation, except a tendency for the plants from higher elevations to have fewer flowers. The majority of collections of *Chione* have been made at relatively low and high elevations, but plants from intermediate areas have leaves and inflorescences of intermediate size. Thus, this variation is continuous, and appears to be correlated with

habitat. Only one species of *Chione* from Costa Rica is recognized here.

Standley originally published his *Chomelia sylvicola* based on a poor fruiting specimen, with a question as to its proper generic placement. The type specimen is clearly seen to represent the higher-elevation, smaller-leaved form of the Costa Rican species of *Chione*.

*Coussarea hondensis* (Standley) C. M. Taylor & W. Burger, comb. nov.

*Psychotria hondensis* Standley, J. Wash. Acad. Sci. 18: 183. 1928.

*Psychotria ostaurea* Dwyer & Hayden, Ann. Missouri Bot. Gard. 54: 143. 1967.

Standley commented in the original description that *Psychotria hondensis* might be better placed in *Coussarea*. *Psychotria* and *Coussarea* are technically distinguished by their ovary condition: *Psychotria* has two ovules, one in each of two locules that are divided by a septum; *Coussarea* is distinguished (along with *Faramea*) by having only a solitary locule, which may be partially divided by an incomplete septum, and contains two free, two partially connate, or one ovule (Schumann, 1891; Steyermark, 1974). However, species that have been classified in *Coussarea* by these same authors include some that have two separate locules, each with one ovule; apparently ovary condition has not been verified by all authors. This character is difficult to observe, particularly when only dried flowering specimens are available, or on plants that have only partially developed fruit, or in dioecious species. Some species of *Coussarea* and *Psychotria* sub. *Heteropsychotria* Steyermark are very similar, so that they are difficult to assign to a genus without checking the ovary condition, although they would be classified in separate tribes based solely on this ovary character. Considering the assemblage of species classified by previous authors into *Coussarea*, there appears to be a suite of additional characteristics shared by these species and probably used by the authors when ovary condition was not seen. These characters are, notably: 1) relatively long white corollas that are fragrant at night, in contrast to usually relatively small white corollas that have fragrance during the day in *Psychotria* (though with exceptions); 2) relatively large, often spongy fruits, in contrast to smaller and usually more succulent fruits in *Psychotria*; and 3) smooth pyrenes that are rounded and have a thin endocarp, in contrast to smooth or ridged pyrenes that are planoconvex and have a very hard endocarp in *Psychotria*. The plant described by Standley as *P. hondensis* frequently has two pyrenes per fruit. These are

smooth and rounded with a thin endocarp, enclosed in a fruit more than one cm in diameter; the corollas are two to three cm long with a strong, sweet fragrance at night. Based on these characteristics, this epithet is here transferred to *Coussarea*. *Coussarea hondensis* appears to be very closely related to *C. austinsmithii* Standley, which apparently replaces it at higher elevations. This latter species has never been given a name in *Psychotria*; the circumscription and relationship of these two species deserves further study. Several specimens of *Coussarea hondensis* were annotated by Standley with an unpublished name, the epithet of which referred to an early collection locality, Bocas del Toro.

*Psychotria camponutans* (Dwyer & Hayden) Hammel, comb. nov.

*Cephaelis camponutans* Dwyer & Hayden, Ann. Missouri Bot. Gard. 55: 35. 1968.

*Psychotria elata* (Swartz) Hammel, comb. nov. *Cephaelis elata* Swartz, Prodr. 45. 1788.

*Psychotria guapilensis* (Standley) Hammel, comb. nov. *Evea guapilensis* Standley, J. Wash. Acad. Sci. 15: 104. 1925.

*Cephaelis discolor* Polakowsky, Linnaea 41: 572. 1877. Not *Psychotria discolor* Huber, 1901.

*Cephaelis tonduzii* K. Krause, Bot. Jahrb. Syst. 54. Beibl. 119: 45. 1916. Not *Psychotria tonduzii* Standley, 1925.

Steyermark studied *Cephaelis* Swartz and *Psychotria* Linnaeus in detail for northeastern South America (1972) and Venezuela (1974), and concluded by combining the species of the neotropical genus *Cephaelis* (including the type) with the neotropical group *Psychotria* subg. *Heteropsychotria*. *Cephaelis* and *Psychotria* subg. *Heteropsychotria* share a number of features that are not found in subg. *Psychotria* or other genera of Psychotrieae. These include: 1) a green or green-grey dried color, in contrast to reddish brown in subg. *Psychotria*; 2) persistent stipules that are united around the stem to form a sheath and usually bear two lobes or awns on each side, in contrast to interpetiolar and usually triangular and caducous in other groups; 3) fruits that are usually blue or purple-black when mature, in contrast to usually red in subg. *Psychotria*; and 4) a similar general aspect, so that sterile plants can be difficult to classify to genus. *Cephaelis* is separated from *Psychotria* only by its subcapitate to capitate inflorescence with well developed bracts. Related plants with contracted inflorescences but small floral bracts and also plants with large bracts but rather open inflorescences are classified in *Psychotria*. Variation in inflorescence contraction and bract size is continuous and independent, however, and is not correlated

with any other features. Steyermark convincingly demonstrated (1972) that *Cephaelis* as generally circumscribed in South America is polyphyletic and represents no more than a convergent assortment of species and species groups, each of them more closely related to species of *Psychotria* than to other species of *Cephaelis*. *Cephaelis* is supposedly more clearly delineated in Central America, where fewer intermediate taxa grow, than in South America. Some authors (notably Standley & Williams, 1975, and Dwyer, 1980) have maintained it here based on its relatively better "coherence" in Central America, its utility as an aid to identification in this speciose group, and "practical purposes." These arguments may be reasonable for recognition of a paraphyletic group that represents a single lineage, but maintaining a clearly polyphyletic group is theoretically unsupportable, and is neither useful nor convenient. The retention of *Cephaelis* for common, showy species, such as *P. elata* and *P. poeppigiana* Mueller Argoviensis [*Cephaelis tomentosa* (Aublet) Vahl], may seem convenient, but such a circumscription of *Cephaelis* would exclude the type of the genus, *Cephaelis axillaris* Swartz, a low herb or subshrub with small pseudoaxillary inflorescences and moderately sized green bracts. *Cephaelis* will be combined with *Psychotria* in the Flora treatment for the La Selva Biological Station. Several new combinations are thus necessary and are made here for species that are restricted to Central America.

#### New Records

The following species are reported from Costa Rica for the first time, all from the La Selva Biological Station: *Borojoa panamensis* Dwyer (*J. Beach 1488*, F, MO), *Faramea parvibractea* Steyermark (*B. Hammel 8052*, DUKE, MO), and *Lasianthus panamensis* (Dwyer) Robbrecht (*B. Hammel & Trainer 13082*, DUKE). All of these species were previously known only from as far north in the Neotropics as Panama (Dwyer, 1980) with the exception of *Faramea parvibractea*, which was previously known only from Venezuela (Steyermark, 1972). These species were previously known only from Caribbean lowland forests in South America and Panama; their presence at the La Selva Biological Station in northeastern Costa Rica suggests that they may be expected in the areas between, as well.

#### ACKNOWLEDGMENTS

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#### LITERATURE CITED

- BAWA, K. S. AND J. H. BEACH. 1983. Self-incompatibility systems in the Rubiaceae of a tropical lowland wet forest. *Amer. J. Bot.* 70: 1281-1288.
- DWYER, J. D. 1980. Rubiaceae. In R. E. WOODSON, JR., R. W. SCHERY, AND COLLABORATORS, *Flora of Panama—Part IX*. *Ann. Missouri Bot. Gard.* 67: 1-522.
- FRANKIE, G. W., H. G. BAKER, AND P. A. OPLER. 1974. Comparative phenological studies of trees in tropical wet and dry forests in the lowlands of Costa Rica. *J. Ecol.* 62: 881-919.
- HAMMEL, B. E. AND M. GRAYUM. 1982. Preliminary report on the flora project of La Selva field station, Costa Rica. *Ann. Missouri Bot. Gard.* 69: 420-425.
- SCHUMANN, K. 1891. Rubiaceae. In A. ENGLER AND K. PRANTL, *Die Natürlichen Pflanzenfamilien* 4: 1-156. Wilhelm Engelmann, Leipzig.
- STANDLEY, P. C. AND L. O. WILLIAMS. 1975. *Flora of Guatemala—Part XI (Rubiaceae)*. *Fieldiana, Bot.* 24(11): 1-274.
- STEYERMARK, J. A. 1972. Rubiaceae. In B. MAGUIRE AND COLLABORATORS, *The botany of the Guayana Highlands—Part IX*. *Mem. New York Bot. Gard.* 23: 407-717.
- . 1974. Rubiaceae. In T. LASSER, ed., *Flora de Venezuela* 9(1-3): 1-2070. Instituto Botánico, Dirección de Recursos Naturales Renovables, Ministerio de Agricultura y Cría, Caracas, Venezuela.
- WILBUR, R. L. 1986. The vascular flora of La Selva Biological Station, Costa Rica. Introduction. *Selbyana* 9: 191.