

Taxonomic Notes on the Tribe Psychotrieae (Rubiaceae) in Panama, Western Colombia, and Ecuador

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ABSTRACT. The new combinations *Faramea papirifolia* (Standley ex Steyermark) C. M. Taylor, *Palicourea amplissima* (Standley ex Steyermark) C. M. Taylor, *Palicourea dimorphandrioides* (Dwyer) C. M. Taylor, *Palicourea grandistipula* (Standley ex Steyermark) C. M. Taylor, *Palicourea remyana* (Baillon) C. M. Taylor, *Psychotria diguana* (Standley ex Steyermark) C. M. Taylor, *Psychotria dives* (Standley) C. M. Taylor, and *Rudgea vallis* (Standley ex Steyermark) C. M. Taylor are made; the new name *Palicourea tunjaënsis* C. M. Taylor is provided for *Psychotria boyacana* Standley; and *Palicourea acanthacea* Standley ex Steyermark ex C. M. Taylor is published based on "*Cephaëlis acanthacea*," an invalid name.

Psychotrieae A. Richard ex Dumortier include the largest number of species of Rubiaceae in the Neotropics, most of them in *Psychotria* L. (perhaps 700 neotropical species, fide Hamilton, 1989). The species of this tribe are united by the combination of drupaceous, usually fleshy fruits with two planoconvex pyrenes each bearing a single seed, hermaphroditic flowers, and valvate corolla aestivation (Steyermark, 1974). In the Neotropics, the Psychotrieae are represented by at least 11 genera, most of them separated from *Psychotria* by one character or a suite of correlated characteristics. Steyermark (1974) provided a key to the neotropical genera of this tribe. The generic placement of some neotropical species of Psychotrieae has been problematic, particularly in cases where the diagnostic generic characteristics were not present on the material studied, such as species placed in *Palicourea* Aublet based only on fruiting material or those placed in *Rudgea* Salisbury based on specimens that lack stipules.

Rudgea (ca. 165 species, all neotropical) is distinguished from other genera of Psychotrieae by its fimbriate or fimbriate-glandular stipules. The fimbriae or glandular appendages may be persistent but are more often caducous and consequently present only on young stipules at the stem apex, and thus can easily be overlooked.

Palicourea (ca. 200 species, all neotropical) is

distinguished from *Psychotria* only by corolla morphology (Taylor, 1989): in *Palicourea* the clearly developed corolla tube is swollen at the base, usually asymmetrically so, and bears an internal ring of dense pubescence just above the basal swelling, presumably protecting it from nectar robbing. In other genera of Psychotrieae the corolla tubes are straight and symmetrical at the base and glabrous or variously pubescent internally but never have the distinctive pattern seen in *Palicourea*. Species of *Psychotria* and *Palicourea* in which the corolla was not examined for these characters may not be placed in the correct genus.

Previously, species of *Psychotria* with capitate to subcapitate inflorescences subtended by well-developed bracts were separated as *Cephaëlis* Swartz. However, as shown by Steyermark (1972; also discussed by Taylor, 1994, Taylor & Lorence, 1992, and Taylor et al., 1991), *Cephaëlis* is polyphyletic and is better combined with *Psychotria* (the older name). This taxonomic rearrangement necessitates new combinations for species originally described in *Cephaëlis*. Generally, placement of a species in *Cephaëlis* has been based entirely on inflorescence structure, but species may be better placed in a genus other than *Psychotria*, or even in another tribe, as in several cases described below.

During review of specimens of Rubiaceae from central Panama and northwestern South America, the need for the following generic transfers and synonymizations became evident.

Faramea papirifolia (Standley ex Steyermark) C. M. Taylor, comb. nov. Basionym: *Cephaëlis papirifolia* Standley ex Steyermark, Acta Biol. Venez. 4: 21. 1964. TYPE: Colombia. "Valle: río Calima (región del Chocó), margen derecha, lomas frente a quebrada de la Brea, alt. 30–50 m, 18, 22 May 1946," José Cuatrecasas 21078 (holotype, US 2825318; isotype, VEN not seen).

Faramea caput-anguis Dwyer & M. V. Hayden, Ann. Missouri Bot. Gard. 55: 29. 1968. Syn. nov. TYPE: Panama. Panamá: Cerro Jefe, 29 July 1967, J. Dwyer & G. Gauger 7375 (holotype, MO 1961869; isotypes, GH not seen, K not seen, NY not seen, UC not seen, US not seen).

Comparison of the holotype specimens of *Cephaëlis papirifolia* and *Faramea caput-anguis* shows that these two names apply to the same distinctive species. Steyermark placed this species in *Cephaëlis* based on its capitate inflorescences enclosed by well-developed bracts and probably also its general similarity (in particular in its swollen peduncles, inflorescence size and shape, and relatively long white corollas) to several species of *Psychotria* found in the same region (e.g., *P. cuatrecasasii* (Standley ex Steyermark) C. M. Taylor, *P. cordobensis* (Standley ex Steyermark) C. M. Taylor, *P. diguana* (Standley ex Steyermark) C. M. Taylor). However, this species is better placed in *Faramea* (Coussareeae Hooker f.) based on its flattened costate young internodes, interpetiolar stipules twisted in bud, and thin-walled seeds that are solitary in each fruit (e.g., *McPherson 7506*, MO).

Palicourea acanthacea Standley ex Steyermark ex C. M. Taylor, sp. nov. *Cephaëlis acanthacea* Standley ex Steyermark, Acta Biol. Venez. 4: 8, figs. 4, 5. 1964, nom. invalid. TYPE: Colombia. Valle: río Calima (región del Chocó), La Trojita, 5–80 m alt., 19 Feb.–10 Mar. 1944, José Cuatrecasas 16572 (holotype, F 1153741 (fl); isotypes, F 1153740, F 1153742 (lf)).

In addition to its subcapitate inflorescences with well-developed bracts, this species bears the diagnostic corolla characters of *Palicourea* and is here transferred to that genus. It is similar to several other species of *Palicourea* of the same region (all presently undescribed). Steyermark originally designated what he considered one specimen as the "holotype," but this was mounted on two separate sheets, F—1153741 with only the inflorescence, and F—1153742 with only the leaves. Unfortunately the nomenclatural codes in effect during and since 1964 specify that a holotype may be only one specimen, so his name was not validly published.

Palicourea amplissima (Standley ex Steyermark) C. M. Taylor, comb. nov. Basionym: *Psychotria amplissima* Standley ex Steyermark, Acta Biol. Venez. 4: 90, fig. 45. 1964. TYPE: Colombia. "Valle: río Calima (región del Chocó), entre La Esperanza y Bellavista, alt. 5–10 m, 8 Mar. 1944," José Cuatrecasas 16787 (holotype, F 1153799; isotype, F 1153798).

This species was placed in *Psychotria* by Steyermark based on the pattern of the internal pubescence of the corolla. This pubescence comprises a dense villous ring internally near the middle of the tube, a continuous less densely pubescent zone

above it, and another villous ring at the top of the corolla tube, so the throat is barbate. This pubescence pattern is similar to that of the corollas of *Palicourea mexiae* Standley and *Palicourea gomezii* C. M. Taylor, which are included in *Palicourea* based on their corollas with a characteristic swollen gibbous base topped by an internal pubescent ring. The type collection of *Psychotria amplissima* has only immature corollas, but swollen, strongly gibbous bases are evident even on these buds and the species is here transferred to *Palicourea*. It is similar to *Palicourea mexiae* and *Palicourea gomezii* vegetatively as well as in corolla features. Additional collections of this species with more mature inflorescences (*Juncosa 556*, MO; *Loiaza & Cogollo 303*, JAUM, MO) have sessile to shortly pedunculate branched inflorescences similar to those of these last two species, rather than the sessile, subcapitate, apparently very young inflorescences of the type collection.

Palicourea dimorphandrioides (Dwyer) C. M. Taylor, comb. nov. Basionym: *Cephaëlis dimorphandrioides* Dwyer, Ann. Missouri Bot. Gard. 67: 66. 1980. TYPE: Panama. Veraguas: valley of Río Dos Bocas on road between Alto Piedras (above Santa Fe) and Calovebora, 350–400 m, 19 Aug. 1974, T. Croat 27470 (holotype, MO 2201358).

Although its inflorescences are densely congested, this species bears the diagnostic corolla characters of *Palicourea* and is here transferred to that genus. The inflorescence is densely paniculate with usually 4–10 pairs of short lateral branches, each consisting of sessile cymules arranged along a sessile central axis 4–7 cm long, so it is not strictly capitate as its description in *Cephaëlis* implied. This species is now known from Chiriquí (*Churchill et al. 4741*, MO) and Bocas del Toro (*Knapp 5102*, MO) in western Panama to Antioquia, Colombia (*Gentry et al. 76164*, MO), and apparently to as far south as Nariño, Colombia (*de Benavides 1335*, MO, but in poor condition).

Palicourea grandistipula (Standley ex Steyermark) C. M. Taylor, comb. nov. Basionym: *Cephaëlis grandistipula* Standley ex Steyermark, Acta Biol. Venez. 4: 19, fig. 9. 1964. TYPE: Colombia. "Valle: Costa del Pacífico, bahía de Buenaventura, quebrada de Aguadulce, alt. 0–10 m, 11 Nov. 1945," José Cuatrecasas 19750 (holotype, F; isotype, US 1564328).

Cephaelis spectabilis Standley ex Steyermark, Acta Biol. Venez. 4: 21. 1964. Syn. nov. TYPE: Colombia. "Valle: Costa del Pacífico, río Yurumanquí, Veneral, alt. 5–50 m, 28 Jan.–10 Feb. 1944," José Cuatrecasas 15734 (holotype, F; isotypes, US 2772254, US 2272255, US 2272256).

This species is similar to *Palicourea amplissima*, in particular in corolla shape, size, and pubescence; the discussion presented under that species regarding generic placement applies also to this species.

The names *Cephaelis grandistipula* and *C. spectabilis* were published simultaneously with the remark that they might be equivalent, which appears to be the case with more material now available. Steyermark separated them based on the number of corolla lobes (five in *C. grandistipula* vs. four in *C. spectabilis*), reportedly different patterns of internal pubescence of the corolla tubes, and the anthers included in *C. grandistipula* versus exerted in *C. spectabilis*. The type collection of *C. spectabilis* is the only collection so far seen with four corolla lobes; each flower also has four stamens, and five calyx lobes. An occasional flower or plant with four rather than five corolla lobes occurs in many species of *Psychotria* and *Palicourea*, and when this variant is noted it has usually not been separated taxonomically (e.g., descriptions in Steyermark, 1974). This same variation does not seem any more significant here, particularly when the number of calyx lobes is consistently five. What differences between these species Steyermark saw in corolla pubescence is not explained, and is not clear from his species descriptions: he described the corolla of *C. grandistipula* as "intus supra basin corollae 6–7 mm dense barbato hic ad faucem dense villosa, parte basilari 6 mm glabra excepta," and that of *C. spectabilis* as "intus 7 mm supra basin dense barbato hic ad faucem villosa parte basali glabra." These seem rather to be equivalent patterns of pubescence, particularly given that both descriptions were based on immature corollas. Instead of a species-level distinction, the difference in anther position Steyermark observed can equally well be interpreted as evidence of distyly in this species, with the two collections representing, respectively, a long-styled flower with the anthers included and a short-styled flower with the anthers partially to wholly exerted. Distyly is predominant in both *Psychotria* and *Palicourea*, and would be expected in *Palicourea grandistipula*, although this condition was sometimes overlooked by Steyermark (e.g., descriptions in Steyermark, 1974). The selection of the name *C. grandistipula* over *C. spectabilis* is based on the more extensive and accurate descrip-

tion (in particular noting five rather than four corolla lobes) and the illustration presented for this first name.

Palicourea remyana (Baillon) C. M. Taylor, comb. nov. Basionym: *Uragoga remyana* Baillon, Adansonia 12: 253. 1879. *Cephaelis remyana* (Baillon) Standley, Publ. Field Columbian Mus., Bot. Ser. 7: 220. 1931. TYPE: Ecuador. Bolívar: "in sylvis inter Guaranda et Bodegas," Remy s.n. (holotype, P not seen, photo (Rockefeller neg. #37223) MO).

Cephaelis jacobinoides Standley, Publ. Field Columbian Mus., Bot. Ser. 7: 221. 1931. Syn. nov. TYPE: Ecuador. At the foot of Mount Chimborazo, Río Chasuan, 900 m, June 1860, R. Spruce 6188 (holotype, K not seen; isotype, W, photo (Rockefeller neg. #31142) MO).

This species bears the diagnostic corolla characters of *Palicourea* (*Albert de Escobar 952*, MO, TEX) and is here transferred to that genus. Standley did not describe the internal corolla pubescence of either *Cephaelis remyana* or *C. jacobinoides*, nor did he note any features that distinguish them. None are evident in the materials available, and these names are here considered synonymous.

Palicourea tunjaënsis C. M. Taylor, nom. nov. Replaced name: *Psychotria boyacana* Standley, Field Mus. Nat. Hist., Bot. Ser. 11: 234. 1936, not *Palicourea boyacana* Standley, Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 194. 1940. TYPE: Colombia. Boyacá: "La Chapón, alt. 1050 meters, edge of forest, July 14 1932," A. E. Lawrence 317 (holotype, F not seen; isotypes, MO 1039030, MO 1572718).

Standley described this species based on a single collection with immature inflorescences. With more material available, this species clearly bears the diagnostic corolla characters of *Palicourea* (*Gilardo-Cañas et al. 1070*, HUA, MO), and is here transferred to that genus. It clearly possesses the corolla characteristics that distinguish *Palicourea*. Accordingly, this new name is provided, which refers to the capital city of the department for which Standley originally named this species.

Psychotria diguana (Standley ex Steyermark) C. M. Taylor, comb. nov. Basionym: *Cephaelis diguana* Standley ex Steyermark, Acta Biol. Venez. 4: 14. 1964. TYPE: Colombia. "Valle: Cordillera Occidental, vertiente occidental, hoyo del río Digua, quebrada del río San Juan, arriba de Queremal, Las Colonias, alt. 1,950–2,050 m, 20 Mar. 1947," José Cuatrecasas 23906 (holotype, US 2825317; isotypes, F not seen, VEN not seen).

Cephaëlis grandiflora Standley ex Steyermark, Acta Biol. Venez. 4: 17, fig. 8. 1964, not *Psychotria grandiflora* H. Mann, Proc. Amer. Acad. 7: 170. 1867. TYPE: Colombia. "Valle: Costa del Pacífico, río Cajambre, Barco, alt. 5–80 m, 21–30 Apr. 1944," José Cuatrecasas 17229 (holotype, F 1168909).

Within *Psychotria*, this species belongs to subgenus *Heteropsychotria* Steyermark, within which it is distinguished by its flowering heads three in each terminal inflorescence and relatively long white corollas. *Psychotria diguana* is similar to *P. cuatrecasasii* (Standley ex Steyermark) C. M. Taylor, with solitary flowering heads and shorter corollas, and to *Faramea papirifolia*, with flowering heads solitary in the leaf axils and fruits with solitary thin-walled seeds. It is also similar to *Cephaëlis longiflora* Standley [Publ. Field Columbian Mus., Bot. Ser. 7: 79. 1930, not *Psychotria longiflora* (Aublet) Willdenow, Sp. pl. 1: 971. 1797, not *Psychotria longiflora* Poiret in Lamarck, Encycl. 5: 704. 1804], which was originally distinguished by its inflorescences with "numerous" capitula, i.e., more than three. (Standley's original description of *C. longiflora* appears to contain a typographical error in the corolla length, which is given as "4 mm" but should be "4 cm.") More material is needed to evaluate the distinctions between *P. diguana* and *C. longiflora*, and transfer of this *Cephaëlis* species to *Psychotria* (or another genus) is postponed until more material becomes available.

Steyermark separated *Cephaëlis grandiflora* by its relatively smaller leaves, flower heads, calyx limbs, and corollas and fewer secondary leaf veins. However, with more material now available, these names can be seen to describe extremes of continuous variation in these characters.

Psychotria dives (Standley) C. M. Taylor, comb. nov. Basionym: *Palicourea dives* Standley, Publ. Field Columbian Mus., Bot. Ser. 7: 130. 1930. TYPE: Colombia. "Santa Rosa, October 24, 1876," Ed. André 4283 (holotype, K not seen; isotype, F 591329).

This species is transferred to *Psychotria* based on its straight corolla tube with the internal pubescence found in the uppermost portion, rather than the basally swollen corolla tube with a discrete internal ring of pubescence near the middle that characterizes *Palicourea*. *Psychotria dives* was apparently assigned to *Palicourea* by Standley based on its well-developed corolla tubes and brightly colored inflorescences. It is similar in this respect to *Psychotria humboldtiana* (Chamisso) Müller Argoviensis of Venezuela and Brazil, and to *Psychotria campyloneuroides* (Standley) C. M. Taylor,

which is sympatric but distinguished by its inflorescence bracts reniform to orbicular versus narrowly elliptic in *Psychotria dives*, and its strongly congested inflorescences versus open cymose in *Psychotria dives*.

In his original description Standley gave the type locality for this species as "Santa Rosa" and the collection date as "October 24, 1876." However, Smith (1965) documented André's departure from South America for France in August 1876, so this seems unlikely to be the actual date of collection. The date and more specific locality taken from Smith's compilation are: Colombia. Pasto, Pasto to Túquerres, Santa Rosa hacienda, 15–16 May 1876. One other Santa Rosa appears in André's itinerary, in Tungurahua in central Ecuador, where André collected in July 1876. The Santa Rosa locality and date cited here are much closer to the date and locality where André made the paratype collection of this same species, "Cugambe" (Smith, 1965: Quebrada de Cuyambé, Túquerres, Colombia), "May 23, 1876," André 3499, and several recent collections of *Psychotria dives* have been made in this same region, while the species is not yet known from Ecuador.

Rudgea vallis (Standley ex Steyermark) C. M. Taylor, comb. nov. Basionym: *Cephaëlis vallis* Standley ex Steyermark, Acta Biol. Venez. 4: 22, fig. 10. 1964. TYPE: Colombia. "Valle: Cordillera Occidental, vertiente occidental, hoyá del río Sanquinín, lado izquierdo, La Laguna, alt. 1,240–1,400 m, 10–20 Dec. 1943," José Cuatrecasas 15528 (holotype, US not seen, photo MO 3157929).

This species was placed in *Cephaëlis* by Steyermark based on its capitate inflorescence enclosed by a pair of enlarged foliaceous bracts. On the type collection the stipules at the stem apex are not in good condition, but on additional material now available (*Gentry 65432*, MO; *Ramos 2371*, CUVC, MO) the distalmost stipules bear several well-developed caducous glandular appendages 1–2 mm long. The presence of such appendages is diagnostic of *Rudgea*, and accordingly this species is transferred to that genus.

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