

Notes on the Rubiaceae of Peru

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ABSTRACT. *Raritebe axillare*, *Gonzalagunia mildredae*, and *G. villosa*, all of Peru and (except *G. mildredae*) Ecuador, are newly described; *Remijia megistocaula* is transferred to *Calycophyllum*; and a key is presented to the eight species of *Gonzalagunia* found in Peru.

These previously undescribed species and the need for the nomenclatural transfer were discovered during study of specimens recently collected in Peru.

NOTES ON *CALYCOPHYLLUM* DC.

Calycophyllum megistocaulum (K. Krause) C. M. Taylor, comb. nov. Basionym: *Remijia megistocaula* K. Krause, Bot. Jahrb. Syst. 40: 319. 1908. TYPE: Peru. Huánuco: between Monzón and Río Huallaga, *Weberbauer* 3687 (holotype, B destroyed; photographs (F negs. #161, #162), MO).

Calycophyllum acreanum Ducke, Arq. Inst. Biol. Veg. 2: 709. 1935. TYPE: Brazil. Acre: Rio Acre, Seringal Iracema, 18 Mar. 1933, *Ducke* HJBR-24414 (holotype, RB not seen; isotype, P not seen, photograph (F neg. # 37200), MO).

Examination of the type photographs shows that these names represent the same species. The leaves on the type collection of *Calycophyllum acreanum* appear discolored, but in other respects (size, shape, and venation pattern) they agree with the photograph of *Remijia megistocaula*.

This species was first described in *Remijia* DC., and was treated in that genus without comment by Standley (1936), who relied primarily on capsule dehiscence to distinguish *Remijia*. However, *R. megistocaula* differs from other *Remijia* species in its terminal inflorescences, rather than axillary, and its corollas with shortly funnelform tubes that are pilose internally and lobes that are convolute in aestivation, rather than elongated cylindrical tubes that are glabrous internally and valvate lobes. These unusual features of *R. megistocaula* are all characteristic of *Calycophyllum*. The capsules with septicidal dehiscence and valves that split secondarily from the apex, features that Standley used to characterize *Remijia*, are also characteristic of *Calycophyllum*. Other features used to characterize *Ca-*

lycophyllum are enlarged bracts that completely enclose developing cymules of flowers, and the presence of expanded petaloid calyx lobes that function as semaphylls (Steyermark, 1974). The enlarged bracts are found in several species of *Calycophyllum*, e.g., *C. candidissimum* (M. Vahl) DC., *C. multiflorum* Griseb., *C. spruceanum* (Benth.) Schum., but not in all, e.g., lacking in *C. obovatum* (Ducke) Ducke and *C. venezuelense* Steyermark. Similarly, the expanded calyx lobes are found in some species, e.g., *C. candidissimum*, *C. obovatum*, and *C. venezuelense*, but not all, e.g., lacking in *C. multiflorum* and *C. spruceanum*. The size, form, and texture of the corollas and capsules of *Remijia megistocaula* are generally similar to those of *Calycophyllum*. Thus the species seems best placed in this genus. Ducke commented in his description of *C. acreanum* that while he had no doubts about its generic placement, his new species was somewhat unusual morphologically within *Calycophyllum*.

NOTES ON *RARITEBE* WERNHAM

The characteristics of *Raritebe* were described in detail by Kirkbride (1979). These must now be emended to include axillary as well as terminal inflorescences. Kirkbride recognized only one variable species, *R. palicoureoides* Wernham, although this may be overly conservative in Central America (cf. Dwyer, 1980). The generic name is here treated as neuter, following Kirkbride (1979); usage by Dwyer (1980) has varied.

Raritebe axillare C. M. Taylor, sp. nov. TYPE: Ecuador. Esmeraldas: Río Zapallo Grande (tributary of Río Cayapa), trail from riverbank opposite to the evangelic mission station, 00°48'N, 78°52'W, 25 Oct. 1982, (imm. fl), *Barfod* 41055 (holotype, MO; isotype, AAU not seen). Figure 1.

Haec species a congeneris omnibus inflorescentiis axillaribus differt.

Erect, small trees to 3 m tall, strigillose becoming glabrescent. *Leaves* opposite; blades elliptic, 16–28 cm long, 7–9.5 cm wide, at apex acute to slightly acuminate and often falcate, at base acute, char-

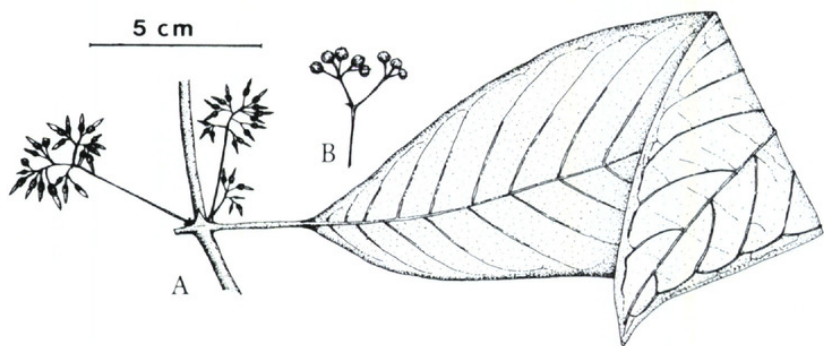


Figure 1. *Raritebe axillare* C. M. Taylor. —A. Habit. —B. Inflorescence. Based on Barfod 41055 (MO).

taceous, on both surfaces glabrous or usually sparsely to moderately strigillose along midrib and secondary veins; secondary veins 11–16 pairs, slightly to strongly interconnected to form an undulating submarginal vein, without domatia; petioles 1.5–4 cm long, similar to leaf midrib in pubescence; *stipules* persistent on distal 2–3 nodes, chartaceous, triangular, 3–10 mm long, acute. *Inflorescences* axillary, 1–2 per node, open cymose, with peduncles 1–5 cm long, with thyrses 2–10 cm long, 2–8 cm wide, with bracts triangular, to 1 mm long, with flowers ca. 15–30 in cymes of 2–5, with pedicels 2–5 mm long; branches, bracts, and pedicels green, strigillose or appressed-pilosulous. *Flowers* (immature) with hypanthium cupuliform to turbinate, strigillose, ca. 1–2 mm long; *calyx* limb 1–1.5 mm long, subtruncate to denticulate with 5 teeth; *corollas* salverform, white, externally puberulent to glabrous, lobes 5, narrowly triangular to linear. *Inflorescences* similar to inflorescences; *fruit* subglobose, smooth, 3–4 mm long, 4–4.5 mm wide; *seeds* subglobose, ca. 0.1 mm diam., with reticulate testa.

Distribution. Coastal Ecuador and Amazonian Peru, in wet forest at 200–250 m elevation.

This species is placed in *Raritebe* based on its lack of raphides, paniculate-thyrsoïd inflorescences with cymose branches, flowers with 5-lobed calyx and corollas, corollas with valvate, reduplicate aestivation and narrow acute shape in bud, baccate fruit, and numerous seeds with testa structure similar to that shown by García Kirkbride (1979: fig. 10) (Kirkbride, 1979). This new species is sympatric with and similar to *R. palicouroides*, from which

it differs in its axillary rather than terminal inflorescences. The specific epithet refers to this distinction.

Although several specimens of *Raritebe palicouroides* show overtopping of old infructescences by vegetative growth from one axil, the plants described here clearly have axillary inflorescences, as demonstrated by production of inflorescences simultaneously from both axils of a node. These inflorescences are produced both with and proximal to healthy leaves, and originate from enlarged structures that suggest that the production of inflorescences in these axils is indeterminate. Variation is seen in development of a submarginal vein; similar variation in all leaf characters is seen in *R. palicouroides*. The data accompanying the type collection indicate that the plant is used locally in the treatment of “headaches, fever, and body pains” by patting the body with the plant. Data accompanying the second collection indicate that the plant is not used medicinally in that area.

Paratypes. PERU. AMAZONAS: Río Cenepa, vicinity of Huampami, hill above Quebrada Tujushik, ca. 5 km E of Chávez Valdivia, 4°30’S, 78°30’W, 24 July 1978 (fr), Ancuash 1081 (MO).

NOTES ON GONZALAGUNIA RUÍZ LOPEZ & PAVÓN

Gonzalagunia has not been treated comprehensively recently; its last review for Peru was by Standley (1936). The following key is offered as an outline of this genus in Peru and as a guide to the identification of the species newly described here.

KEY TO SPECIES OF GONZALAGUNIA IN PERU

- 1a. Leaf blades tomentose to floccose on lower surface of lamina, the trichomes generally white.
 - 2a. Leaf blades with sparse pubescence of lower surface of lamina spreading and dull white *G. dependens* Ruíz Lopez & Pavón
 - 2b. Leaf blades with pubescence of lower surface of lamina appressed and bright white *G. chionea* Standley ex Steyererm.
- 1b. Leaf blades glabrous to pilosulous on lower surface of lamina, the trichomes generally colorless to brown.

- 3a. Leaves subsessile, blades ovate, rounded to somewhat cordate at base *G. mildredae* Simpson ex C. M. Taylor
- 3b. Leaves petiolate, blades elliptic to lanceolate, obtuse or cuneate to acute at base.
 - 4a. Stems and lower leaf surfaces spreading-pilous, at least along midrib.
 - 5a. Stipules with short base 1–2 mm long, abruptly contracted to a very narrowly triangular apex 2–10 mm long; corollas with tubes 5–6 mm long; fruit with 4 cocci *G. villosa* Simpson ex C. M. Taylor
 - 5b. Stipules triangular, uniformly tapered, 10–20 mm long; corollas with tubes 6.5–8 mm long; fruit with 2 cocci *G. pachystachya* Standley
 - 4b. Stems and lower leaf surfaces appressed-strigose to -strigillose.
 - 6a. Corolla tubes 7–8 mm long, lobes 5–6 mm long; pedicels 1–4 mm long *G. affinis* Standley ex Steyererm.
 - 6b. Corolla tubes 4–6 mm long, lobes 2–3 mm long; pedicels to 1.5 mm long.
 - 7a. Leaf blades 1.5–5.5 cm wide *G. cornifolia* (HBK) Standley
 - 7b. Leaf blades 6–15 cm wide *G. bunchosioides* Standley

Gonzalagunia mildredae D. Simpson ex C. M. Taylor, sp. nov. TYPE: Peru. Huánuco: Prov. Leoncio Prado, distrito Rupa Rupa, road to Jacintillo, left bank of Río Monzón, 20 Mar. 1972 (fl), *Schunke* 5293 (holotype, MO; isotype, F). Figure 2.

Gonzalagunia sessilifoliae Standley similis, sed ab ea stipulis longioribus (15–20 mm longis), lobulis calycinis aequalibus ca. 0.8 mm longis et tubo corollino longiore (8–9 mm longo) differt.

Erect shrubs or small trees to 12 m tall, strigillose to usually strigose throughout. *Leaves* opposite, subsessile; blades ovate, 6–14 cm long, 2.5–6.5 cm wide, at apex long-acute to slightly acuminate, at base rounded to somewhat cordate, chartaceous to somewhat subcoriaceous, above glabrous to sparsely strigillose, below strigillose along the veins but glabrous on the remaining surfaces; secondary veins 8–10 pairs, basal 2–4 veins originating from petiole attachment, without domatia; petioles 0–2 mm long, similar to leaf midrib in pubescence; *stipules* persistent, membranaceous, strigillose to glabrescent, lanceolate to triangular, 15–20 mm long, acute to slightly acuminate, sometimes with a thickened midrib. *Inflorescences* spiciform, with peduncles 3–6 cm long, with thyrses 20–33 cm long, 1–2 cm wide, with bracts narrowly triangular to linear, 2–5 mm long, with flowers ca. 40–60 in sessile cymes of 1–3, these separated 3–10 mm along axis, with pedicels 1–3 mm long; axis, peduncle, bracts, and pedicels green, densely strigillose; *flowers* with hypanthium cupuliform, densely strigillose to pilosulous, 1–1.5 mm long; *calyx* limb glabrous, 0.8–1 mm long, lobed for ca. ½ its length, lobes 4, rounded, with sinuses rounded; *corollas* salverform, white, externally densely appressed-pilose to more sparsely so on lobes, internally pilosulous at apex of tube with trichomes included, tubes 8–9 mm long, lobes 4, lanceolate, 4–5 mm long, 3–4 mm wide, rounded; anthers very narrowly oblong, 2.1–2.2 mm long.

Infructescences similar to inflorescences; *fruit* subglobose to oblate, with 4 cocci, 4–5 mm long, 5–6 mm wide when young, becoming white and 8 mm long, 9 mm wide.

Distribution. Amazonian Peru, in wet forests at 680–1,100 m elevation.

This species is distinguished by its subsessile ovate leaf blades with the basal 2–4 veins originating from the petiole attachment and the base rounded to usually subcordate. In this respect it is similar to *Gonzalagunia sessilifolia* Standley of Ecuador, which can be separated by its broader leaves, 5–9 cm wide, of a markedly more membranaceous texture; its shorter stipules, 5–10 mm long, that are narrowly triangular to subulate; its longer and markedly unequal calyx lobes, 1–3 mm long on a single flower; and its smaller corollas, with tubes 2.5–3 mm long and lobes 1–1.5 mm long.

Gonzalagunia mildredae was separated as a new species and its name chosen by Donald Simpson, formerly of the Field Museum of Natural History, who unfortunately did not publish his work. The name and the type specimen he selected are used here. The specific epithet honors Mildred Mathias, an outstanding student of the South American flora.

Paratypes. PERU. HUÁNUCO: Prov. Leoncio Prado, Tingo María, 3 Aug. 1964 (fr), *Dwyer* 6283 (MO); distrito Rupa Rupa, road from Tingo María to Lechuzas Cave, 9°18'S, 75°59'W, 24 Mar. 1982 (fl), *King & Ramírez Rengifo* 369 (MO); vicinity of Tingo María, trail from airport bridge to Monzón–Huallaga junction, 21 June 1960 (fl, fr), *Mathias & D. Taylor* 4063 (F, MO). UCAYALI: Prov. Coronel Portillo, distrito Padre Abad, Río Chino W of Acapulco Restaurant, 6 June 1976 (fl, fr), *Schunke* 9164 (F, MO).

Gonzalagunia villosa D. Simpson ex C. M. Taylor, sp. nov. TYPE: Peru. Ucayali: Prov. Coronel Portillo, distrito Calleria, Carretera Pucallpa Km 90, San Alejandro, 21 Feb. 1972

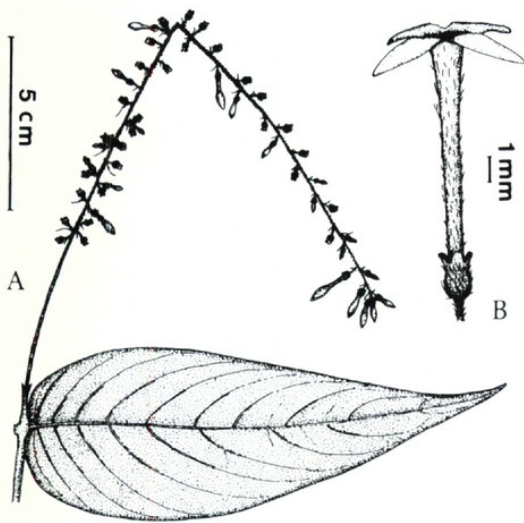


Figure 2. *Gonzalagunia mildredae* D. Simpson ex C. M. Taylor. —A. Habit. —B. Flower. Habit based on King & Ramírez 369 (MO), flower on Mathias & Taylor 4063 (MO).

(fl, fr), Schunke 5272 (holotype, MO; isotype, F). Figure 3.

Haec species a parte majore congenerorum indumento pilosulo dense etiam a *Gonzalagunia pachystachya* Standley corollae tubo 5–6 mm longo et lobulis 3–4 mm longis instructa differt.

Erect shrubs or small trees to 9 m tall, densely pilosulous throughout with trichomes spreading and usually drying brown. *Leaves* opposite or occasionally ternate; blades elliptic to lanceolate, 5–28 cm long, 2–11 cm wide, at apex acute to slightly acuminate, at base acute to cuneate, chartaceous to membranaceous, above glabrescent to sparsely appressed-pilosulous or sometimes more densely so on midrib, below spreading-pilosulous; secondary veins 7–13 pairs, without domatia, with midrib frequently pale or reddened below; petioles 2–20 mm long, similar to leaf midrib in pubescence; *stipules* persistent, chartaceous, pilosulous, triangular with basal portion 1–2 mm long and abruptly contracted to a narrowly triangular to linear tip 2–10 mm long. *Inflorescences* spiciform, with peduncles 1.5–3.5 cm long, with thyrses 15–30 cm long, 1–2 cm wide, with bracts linear, to 3 mm long, with flowers ca. 60–100 in sessile cymules of 2–5, these separated 3–10 mm along axis, with pedicels 0.5–2.5 mm long; axis, peduncle, bracts, and pedicels green, densely strigillose to pilosulous; *flowers* with hypanthium ellipsoid, densely strigillose to pilosulous, 1–1.5 mm long; *calyx* limb glabrous, 1–1.5 mm long, lobed nearly to base, lobes 4, ovate to elliptic, frequently unequal, rounded, with sinuses acute; *corollas* salverform, white, externally moderately to densely strigillose to often sparsely so on lobes, in-

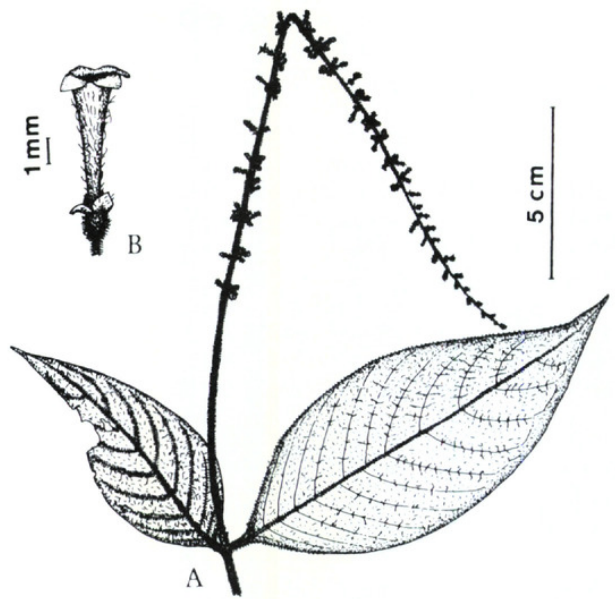


Figure 3. *Gonzalagunia villosa* D. Simpson ex C. M. Taylor. —A. Habit, smaller leaf showing abaxial surface. —B. Flower. Based on Schunke 5272 (MO).

ternally pilosulous at apex of tube with trichomes included, tube 5–6 mm long, lobes 4, triangular, 3–4 mm long, 1–1.2 mm wide, rounded to obtusely angled. *Infructescences* similar to inflorescences; *fruit* subglobose to oblate, with 4 cocci, 2–2.5 mm long, 3–4 mm wide, becoming white.

Distribution. Amazonian Ecuador and Peru, in wet forests at 200–450 m elevation.

Gonzalagunia villosa is distinguished by its dense pilosulous pubescence, relatively small stipules with narrowly triangular apices, and relatively short corollas. *Gonzalagunia pachystachya* Standley of Ecuador and Peru is similarly pilosulous, but differs in its triangular stipules that are not strongly narrowed at the apex, corollas with tubes 6.5–8 mm long and lobes 5–6 mm long, and fruit with 2 cocci and 3–4 mm long by 4–6 mm wide. The specific epithet refers to the characteristic pubescence.

The flowers of *Gonzalagunia villosa* are reportedly fragrant. This species shows wide variation in leaf size. The type specimen has leaves that generally represent the smaller end of the range. Similar variation in vegetative features is seen in many, if not most, species of *Gonzalagunia*, which characteristically are found in secondary habitats, although the labels of *G. villosa* generally attribute it to dense or mature forest.

Paratypes. ECUADOR. NAPO: Jatun Sacha Biological Station, 8 km E downstream of Puerto Misahualli, on the Río Napo, 1°04'S, 77°37'W, 28 Mar. 1990 (fl, fr), Bensman 80 (MO); Coco, road to Las Arcas, spur trail to N, 23 July 1977 (fl), Boeke 2221 (MO); along road SE of Francisco de Orellano (Coco) on the way to El Auca, 14.6

km past bridge over the Río Napo, 00°37'S, 76°40'W, 5 Oct. 1980 (fl), *Croat* 50393 (MO). PERU. AMAZONAS: SE of Huampami, trail to Aintami, 17 Dec. 1972 (fl), *Berlin* 587 (F, MO); ridge above Quebrada Chikishuk, a tributary of Huampami, entering from S about 5 km from confluence with Río Cenepa, 21 Dec. 1972 (fl), *Berlin* 653 (F, MO); S of Huampami, trail to house of Theodora, S of Río Cenepa, 17 July 1974, *Berlin* 1683 (F, MO); Huambisa, valle del Río Santiago, ca. 65 km al N de Pingo, Quebrada Caterpiza, 2–3 km atrás de la comunidad de Caterpiza, 19 Sep. 1979 (fr), *Huashikat* 687 (MO), 11 Feb. 1980 (fl), *Huashikat* 2039 (MO); Aintami, al lado del Río Cenepa, 14 Feb. 1973 (fl, fr), *Kayap* 357 (F, MO); Huampami, Río Cenepa, 15 June 1973 (fl, fr), *Kayap* 974 (F, MO); Quebrada Satik entsa, 16 July 1974 (fl, fr), *Kayap* 1111 (F, MO); al lado del Río Huampami, 18 July 1974 (fr), *Kayap* 1220 (F, MO); Río Cenepa, vicinity of Huampami, ca. 5 km E of Chávez Valdivia, 10 km en camino de Chigkan entsa, 4°30'S, 78°30'W, 8 Aug. 1978 (fr), *Kujikat* 199 (MO); Río Cenepa, vicinity of Huampami, ca. 5 km E of Chávez Valdivia, al lado de Kachaim, Quebrada Huampami, 4°30'S, 78°30'W, 15 Aug. 1978 (fl), *Kujikat* 391 (F, MO). SAN MARTIN: Prov. Lamas, distrito Lamas, N of San Antonio 2–4 km along Río Cumbasa, 2 Oct.–4 Nov. 1937 (fl, fr), *Belshaw* 3529

(MO). UCAYALI: Padre Abad, Pucallpa, Irezola, Km 79 camino Francisco Basáche, 10 Apr. 1989 (fr), *F. Chávez* 336 (MO).

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