
Morphology and Taxonomy of *Arcytophyllum serpyllaceum* (Rubiaceae), a Transfer from *Hedyotis*

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ABSTRACT. Morphological and distributional data are presented for *Hedyotis serpyllacea*, native to Guatemala and southern Mexico. The species is transferred to *Arcytophyllum*, extending the range of the genus northward from Costa Rica, Panama, and South America.

The relationships of the Mexican and Guatemalan species *Hedyotis serpyllacea* Schlechtendahl (Rubiaceae; Hedyotideae) have been problematical for some years. Its flowers, fruits, and seeds are not similar to those of *Houstonia* (Terrell, 1996), *Oldenlandia*, or *Hedyotis*. In 1893 the species was given the name *Mallostoma shannonii* Donnell Smith, and later Standley transferred it to *Arcytophyllum*. Morphological data demonstrate that Standley was correct in placing it in *Arcytophyllum*; however, a new combination is necessary.

Mena (1990), in a revision of *Arcytophyllum* Willdenow ex Schultes & Schultes f., recognized 15 species native to higher elevations in Costa Rica, Panama, and the Andes of Venezuela, Colombia, Ecuador, Peru, and Bolivia. Eleven species are erect subshrubs and four are prostrate, mat-forming, and suffruticose. Mena (1990) listed the name *Arcytophyllum shannonii* (Donnell Smith) Standley among “Excluded and Dubious Names” as a synonym for *Hedyotis serpyllacea*.

Hedyotis serpyllacea grows at high elevations (1500 to 3500 m) in Guatemala and southern Mexico (Oaxaca, Veracruz, and Chiapas) and has several vegetative and reproductive morphological similarities to species of *Arcytophyllum*. The plants are prostrate, mat-forming, and suffruticose; the stems have a “jointed” appearance; the stipules are generally similar to those of *Arcytophyllum*; the leaves are small, rather thick, and leathery; the calyx has intercalycine teeth; the corollas are rather thick, purplish externally and white within; and the capsules are broadly oblong, thick-walled, and tardily dehiscent. All of these characteristics occur especially in the prostrate, suffruticose species of *Arcytophyllum*, to which *H. serpyllacea* is most closely allied. Seeds are compressed, rounded in

outline, and with a central punctiform hilum. The seeds as shown by scanning electron microscopy are very similar to those of *Arcytophyllum muticum* (Weddell) Standley, a prostrate, suffruticose species of Costa Rica, Panama, and South America.

Seeds of Hedyotideae have been found to be very important in classification (Terrell, 1996). Seeds of *Houstonia* are crateriform and the hilum is on a hilar ridge (Terrell, 1996), whereas seeds of *Hedyotis serpyllacea* are non-crateriform (without ventral depressions or cavities) and lack hilar ridges. *Oldenlandia* seeds are trigonous or conical and usually much smaller than those of the other genera. *Hedyotis* as presently recognized includes a heterogeneous array of species, as previously pointed out (Terrell, 1996). I have examined seeds of all of the Western Hemisphere species of *Hedyotis*, as well as those of many of the Asian species including the type, *H. fruticosa* L., and all of these seeds differ from those of *Hedyotis serpyllacea*.

A systematic treatment of *Arcytophyllum serpyllaceum* (*Hedyotis serpyllacea*) is presented here. This extends the distribution of *Arcytophyllum* from Panama and Costa Rica into Guatemala and southern Mexico, and also records the first collection of *H. serpyllacea* in Oaxaca (first noticed by Robert King, cited as Terrell & King 4441).

Arcytophyllum serpyllaceum (Schlechtendahl) Terrell, comb. nov. Basionym: *Hedyotis serpyllacea* Schlechtendahl, Linnaea 9: 599. 1834. *Houstonia serpyllacea* (Schlechtendahl) C. L. Smith ex Greenman, Proc. Amer. Acad. Arts 32: 284. 1897. TYPE: Mexico. Veracruz: between La Joya and San Salvador, June 1829, Schiede 265 [Deppe’s name was not included with Schiede’s] (holotype, HAL; isotypes, F, HAL, MO; photos taken at B are at F, GH, MO, NY, US; however, the B specimen was destroyed during World War II).

Mallostoma shannonii Donnell Smith, Bot. Gaz. (Crawfordsville) 18: 203. 1893. *Arcytophyllum shannonii* (Donnell Smith) Standley, Contr. U.S. Natl. Herb. 18: 128. 1916. TYPE: Guatemala. Chimaltenango:

"forming a carpet-like turf." alt. 9000 ft., Chichoy [or Chicoy], Mar. 1892, *W. C. Shannon s.n.* (holotype, US-48603; isotype, US-943475).

Perennial herb with woody rhizomes. Stems prostrate, creeping, often matted, rooted at nodes, slender, angulate, often woody at base, glabrous or pubescent at nodes, outer layers of stem becoming loose and broken, stems often appearing jointed. Stipules to 2 mm long, ovate, with short to long, narrow caudae, these glabrous, pubescent, or ciliolate, 1–few marginal teeth with or without reddish, stalked apical glands. Leaves sessile or subsessile, 1-nerved, paler beneath, thickened, somewhat leathery, 2–9 mm long, 1–5 mm wide, ovate or elliptic, obtuse or acutish at apex, rounded at base, glabrous, margins revolute, sometimes scabrous. Flowers axillary, solitary, heterostylous, pedicels to 7 mm long, slender to stout, sometimes reflexed in fruiting stage. Hypanthium glabrous, calyx lobes 4, 1.0–3.8 mm long, 0.5–0.9(–1.5) mm wide, lanceolate, ovate, oblanceolate, or obovate, obtuse or acute at apex, sometimes with linear or awn-like intercalycine teeth to ca. 1 mm long. Corollas 6.0–10.0 mm long, funnellform, thickish, white within, typically purple or reddish purple externally on lobes, tube greenish externally; buds white or reddish purple; tube 3–5 mm long, 2–3 mm wide at throat, glabrous externally, pubescent distally within; lobes 4, 2.5–4.8 mm long, 1.2–1.7 mm wide, ovate or elliptic, thickish, densely white-pubescent within (hairs to ca. 1 mm long). Pin flowers with styles slender, whitish, stigma branches ca. 1–2.3 mm long, oblong or linear, exerted to ca. 2 mm beyond corolla throat, anthers 1–2 mm long, whitish, oblong, included in distal $\frac{1}{2}$ – $\frac{3}{4}$ of corolla tube, on short filaments. Thrum flowers with anthers 0.9–1.8 mm long, subsessile, narrowly oblong, slightly exerted on short filaments, stigma branches ca. 1.0–1.4 mm long, whitish, broadly oblong, included in distal $\frac{1}{2}$ of corolla tube, on short styles. Capsules 1.5–4.0 mm long, 2.0–3.5 mm wide, usually somewhat longer than wide, $\frac{3}{4}$ to fully inferior, broadly oblong or obovate, with several raised nerves, thick-walled, apparently tardily dehiscent or indehiscent, apex rounded and with shallow central depression. Seeds 12–29 per capsule, 0.6–1.2 mm diam., black, strongly compressed, lenticular, in outline orbicular, orbicular-polygonal, or broadly elliptic, dorsal and ventral faces convex, flat, or obscurely ridged, ventral face with hilum punctiform, \pm centric, on flat or minutely depressed surface, testa finely reticulate. Flowering all year. Chromosome number not known.

Distribution. Guatemala; Mexico (Veracruz, Oaxaca, Chiapas). Grassy places, meadows, pastures, roadsides, open disturbed areas, stream banks, thin forest, alt. ca. 1500–3500 m.

Additional specimens examined. GUATEMALA. **Chimaltenango:** Chichavec, *Skutch 124* (US); Barranco de la Sierra, SE of Patzum, *Standley 61552* (MICH); near Chocoyos, *Williams 13142* (GH, MICH); Cerro Chichoy, near Chichoy, *Williams & Molina R. 15339* (GH). **Guatemala:** San José Pinula, *Salas 312* (US). **Huehuetenango:** Sierra de los Cuchumatanes, km 311 on Ruta Nac. 9 N between Paquix and Chemal, *Beaman 2983* (GH, TEX, US); Chemal, Sierra Cuchumatanes, *Molina R. & Molina 26413* (ENCB, MICH); Ruta 9N ca. 10 mi. N of Chiantla, *Sanders 74109* (MICH). **Quezaltenango:** Cuesta de El Caracol, 5–8 km N of San Juan Ostuncalco, *Williams et al. 22771* (NY, US). **Quiché:** San Miguel Uspantan, Apr. 1892, *Heyde & Lux 3176* (GH, US). **Sacatepéquez:** loc. unknown, *Standley 60766* (NY). **San Marcos:** Volcan Tacaná, E side of mountain at La Hacienda, *Beaman 3197* (GH, US). **Sololá:** hwy. CA-1, 2.5 mi. E of intersection of hways. 1 and CA-1, *Denton 1794* (MICH). **Totonicapán:** Tecum Uman Ridge, 20 km E of Totonicapán, *Beaman 4167* (GH, TEX, US). MEXICO. **Chiapas:** San Cristóbal de las Casas, *Alexander 1063* (MICH, NY), *Breedlove 6044* (DS, ENCB, F, MICH), *Laughlin 9* (DS, LL, MSC), *Paray 323* (ENCB), near same locality, *Nee & Mori 3487* (WIS); between San Cristóbal de las Casas and Tenejapa Center, *Breedlove 9239* (DS); paraje of Yal Ichin, mpio. Chamula, *Breedlove 9532* (DS, F); Cerro Huitepec W of San Cristóbal de las Casas, *Breedlove 25299* (DS); 3 mi. NW of San Cristóbal de las Casas, *Carlson 1579* (F); loc. unknown, *Ghiesbrecht 814* (GH, K, MO, NY); San Cristóbal to Buenavista, *Miranda 4990* (MEXU); Cerro del Boquerón, *Purpus 7171* (BM, F, GH, MO, NY, US). **Oaxaca:** El Tejocote, 52 km NW of Oaxaca City, *Terrell & King 4441* (US). **Veracruz:** La Zimienta, Cofre de Perote, *Balls 4629* (US); Ingenio El Rosario, Mpio. Xico, *Narave F. et al. 293* (XAL); road to Las Minas, 3 km N of Cruz Blanca jct. with Hwy. 140, *Nee et al. 26053* (XAL), *Terrell & Koch 5381* (CHAPA, US); Las Vigas pedregal near La Joya, *Sharp 45572* (MEXU, TENN, US); Jalapa, *Smith 1486* (MO); just W of La Joya, 10 km E of Las Vigas, *Terrell & King 4455* (US), *Terrell & Koch 5380* (CHAPA, US); Zoatzingo, mpio. Altotonga, 2 km S of turn-off to Altotonga, *Terrell & Koch 5384* (CHAPA, US); San Miguel El Soldado, mpio. San Miguel, *Ventura A. 648* (US).

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