

A new species of *Comocladia* (Anacardiaceae) from Belize and Guatemala

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Abstract. *Comocladia mayana*, a new species of Anacardiaceae, is described, mapped and illustrated. The species is endemic to western Belize and adjacent Guatemala and is restricted to semi-deciduous moist forest on karstic limestone formations. It differs from all other *Comocladia* species by the combination of entire to subentire, acuminate leaflets and tetramerous staminate flowers.

Resumen. *Comocladia mayana*, una especie nueva de Anacardiaceae, se describe, mapea e ilustra. La especie es endémica al oeste de Belice y Guatemala y se limita a bosque húmedo semi-deciduo sobre formaciones de piedra caliza cárstica. Se diferencia de otras especies de *Comocladia* por la combinación de foliolos enteros a subenteros y, acuminados, y flores estaminadas tetrámeras.

The neotropical genus *Comocladia* (Anacardiaceae) has approximately 20 species distributed in Mexico, northern Central America, and the West Indies. It is apparently absent from southern Central and South America (absent from Honduras southward). The species are polygamodioecious shrubs or trees that are usually unbranched and have contact dermatitis-causing exudate that quickly oxidizes to black. The leaves are alternate, imparipinnate, and petiolate with opposite, petiolulate leaflets that have toothed to spinose margins (rarely entire). The inflorescences are axillary panicles of flowers with three to four-parted, imbricate perianths of light red calyces and red to purple corollas. The androecium is haplostemonous with subulate to filiform filaments that are inserted at notches in the disk. The anthers are basifixed. The disk is cup-shaped, slightly lobed and glabrous, subtending reduced staminodes and a reduced pistillode. There are three carpels with three (or no) styles and three stigmas. The fruits are one-locular, oblong-ellipsoidal drupes with

a persistent calyx, a yellow, red or black exocarp and fleshy mesocarp. The seeds are oblong with fleshy cotyledons (Pell et al., 2011).

The genus was first reported for Belize in 2000 as *Comocladia guatemalensis* Donn. Sm. (Balick et al., 2000) based on a collection made by Gerrit Davidse and Alan Brant (32158) in 1987 (see below). The same species was later reported for Belize by Steven Brewer (Brewer et al., 2003) from the Bladen Reserve (near the Davidse and Brant collection) and by Calonje (2009) from the Cayo District in central Belize, but neither cited specimens.

In 2007, the senior author discovered a fourth population of *Comocladia* in Belize, located in the far western portion of the Cayo District. Based on field observations and examination of preserved specimens (including relevant types), it became clear that the Belize plants were distinct from *Comocladia guatemalensis* and other described species. Additional specimens have expanded the range into the Petén Department of Guatemala. We have not seen specimens upon which the

Brewer et al. (2003) and Calonje (2009) reports are based, but according to Jan Meerman (pers. comm.) the plants reported by Calonje (as *Comocladia guatemalensis*) are conspecific with those of the type of the new species herein described.

Comocladia mayana Atha, J. D. Mitchell & Pell, **sp. nov.** Type: Belize. Cayo: ca. 18 km WSW of San Ignacio, NW side of Macal River, Chaa Creek Nature Reserve, 17.111220°N, 89.072071°W (± 25 m), ca. 80 m, 25 Feb 2007 (σ fl), *D. E. Atha, H. Tut & M. Eliah 5604* (holotype: BRH; isotypes: MEXU, MO, NY). (Fig. 1)

Ab omnibus ceteris speciebus generis *Comocladia* foliis integris vel subintegris acuminatis atque floribus masculinis tetrameris differt.

Trees 3–6 m tall; stems solitary, simple, decumbent to erect, sometimes repent or reclining, 5–20 cm diameter near the base; bark brown, thin; sap watery, clear, soon oxidizing to black; cataphylls imbricate, cymbiform, ca. 7 mm long, densely rusty-sericeous or rarely glabrous. Leaves aggregated near the apex of the stems, alternate, spiral, patent or slightly ascending, imparipinnate, 5–9 jugate, 36–77 cm long; petioles 5–13 cm long, terete, striate, short-villous or glabrous, the hairs brown, simple; leaflets sub-opposite, chartaceous, the adaxial surface strigose or glabrous, dark green, the abaxial surface strigose or glabrous, lighter green, pilose or glabrous along major veins, venation cladodromous, secondary vein pairs 8–18; lateral leaflet petiolules 1–3 mm long, pilose or glabrous, basal pair diminutive, increasing acropically, blades oblong or oblong-elliptic (basal pair ovate), symmetrical to suboblique, 4–17 \times 2.5–7 cm, the base rounded to cordate, the margin entire or subentire, slightly revolute, the apex acute to abruptly short-acuminate; terminal leaflet petiolules 0.5–4.4 cm long, blades elliptic or elliptic oblong, 3.5–17 \times 2.5–5.8 cm, the base rounded, obtuse or cuneate, the margin entire or subentire, slightly revolute, the apex acute to abruptly short-acuminate. Inflorescences alternate and spirally arranged above the leaves, shorter than the leaves, 27–47 cm long, ascending; peduncles 5–17.5 cm

long, puberulent or glabrous. Flowers clustered on remote, short branches 0–10 cm long. Staminate flower buds globose ca. 1 mm diameter; perianth imbricate, 4-merous, glabrous; sepals basally united, forming a squarish cup, the lobes ovate, 0.5–0.6 \times 0.5–0.6 mm, pink; corolla rotate, 2.5–3.0 mm diameter, the petals ovate, 0.7–1.0 \times 0.7–0.8 mm, fleshy, purple; stamens 4, alternating with the petals, much shorter than petals, the filaments flattened, subulate, 0.3–0.4 mm long and ca. 0.2 mm diameter in the center, the anthers basifixed, ellipsoid ca. 0.15 mm long; intrastaminal disk 0.5–0.7 mm diameter and ca. 0.2 mm high, weakly 4-lobed, the lobes projecting between the stamens and opposite the petals, glabrous; ovary globose, glabrous, ca. 0.2 mm diam. Ovulate flowers not seen. Fruits oblong-ellipsoid, 1.3–1.5 \times 1.0 cm, the exocarp smooth, the mesocarp thin, fleshy. Seed ellipsoid, 0.8 \times 0.5 cm, the seed coat smooth and veiny; cotyledons large, fleshy.

Distribution and ecology.—The species is endemic to western Belize and adjacent eastern Guatemala in semi-deciduous forests, exclusively on karstic limestone formations (Fig. 2).

Phenology.—Male flowers fertile February and March; fruit ripe in April.

Etymology.—The epithet honors the Mayan region to which the species is endemic.

Additional specimens examined. BELIZE. Toledo: sin. loc., 4 Apr 1907 (σ fl), *Peck 816* (GH); Solomon Camp, vic. of the junction of Richardson Creek and Bladen Branch, 16°32–33'N, 88°45–46'W, 80–420 m, 5,7,9,12 Mar 1987, *Davidse & Brant 32158* (NY).

GUATEMALA. Petén: Santa Elena, 7 km SE of the village on Old Santa Ana trail, 25 Mar 1961 (σ fl), *Contreras 2036* (LL-2 sheets); 3 km N of Macanché, 7 Feb 1966 (σ fl), *Contreras 5499* (F-2 sheets, US); camino para Poptún, km 75, 15 Apr 1970 (fr), *Ortiz 989* (F, MO).

The distribution of this species is very similar to the recently-described *Acalypha gentlei* Atha (Euphorbiaceae), with which it shares the following arborescent associates: *Metopium brownii* (Jacq.) Urb. (Anacardiaceae), *Plumeria rubra* L. forma *acutifolia* (Poir) Woodson (Apocynaceae), *Cryosophila stauracantha* (Heynh.) R. Evans (Arecaceae), *Schippia concolor* Burret (Arecaceae), *Bursera simaruba* (L.) Sarg. (Burseraceae), *Clusia flava* Jacq. (Clusiaceae), *Alseis yucatanensis* Standl.

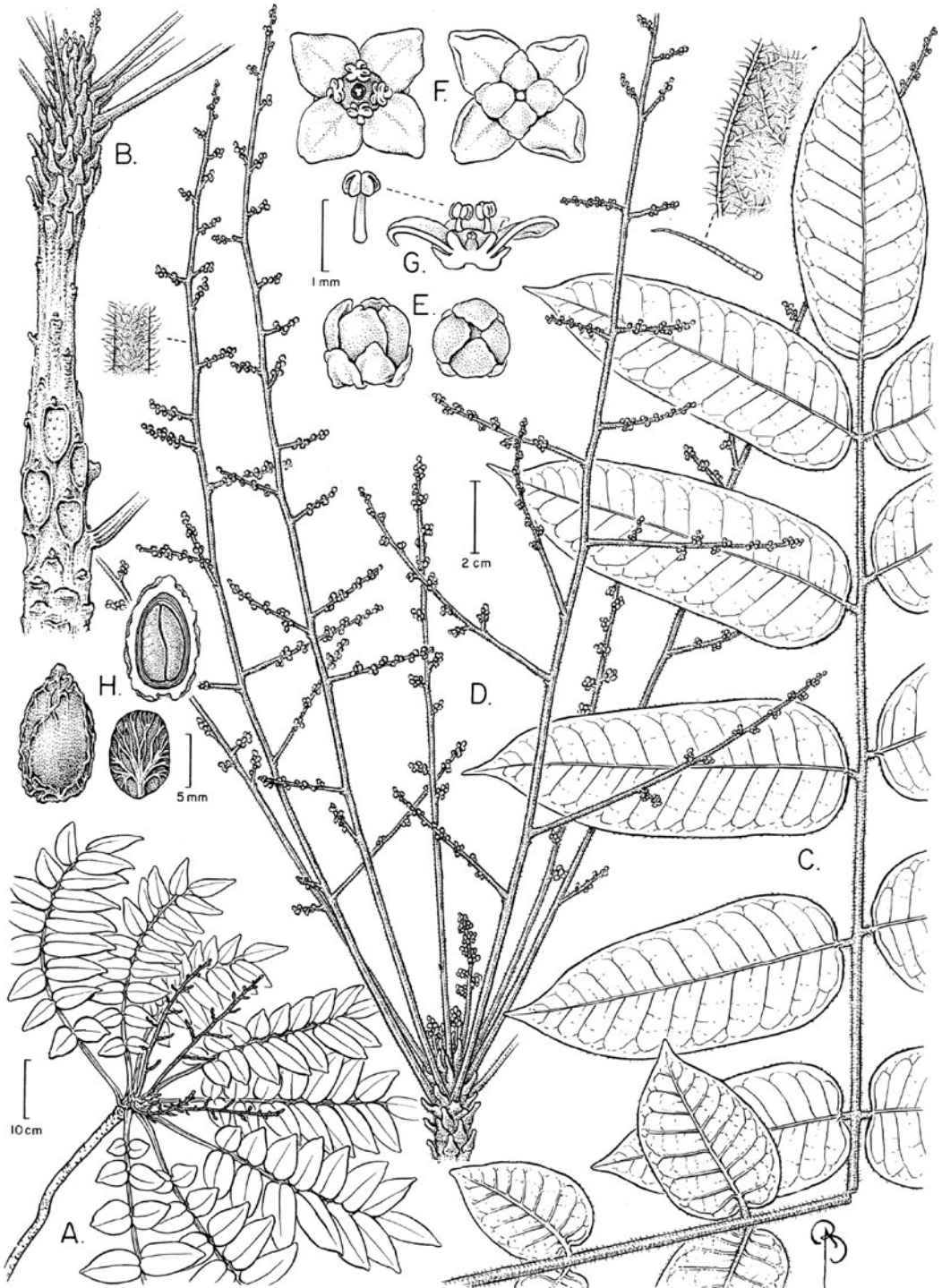


FIG. 1. *Comocladia mayana*. A. Habit. B. Stem apex showing leaf scars (below) and cataphylls (above). C. Portion of leaf. D. Male inflorescence. E. Male flower buds. F. Top view of male flower (left), bottom view of male flower (right). G. Side view of male flower, with stamen enlarged. H. Fruit (left); fruit longitudinal section (upper right); seed with seed coat (bottom right). (A-G from the type; H from Ortiz 989.)

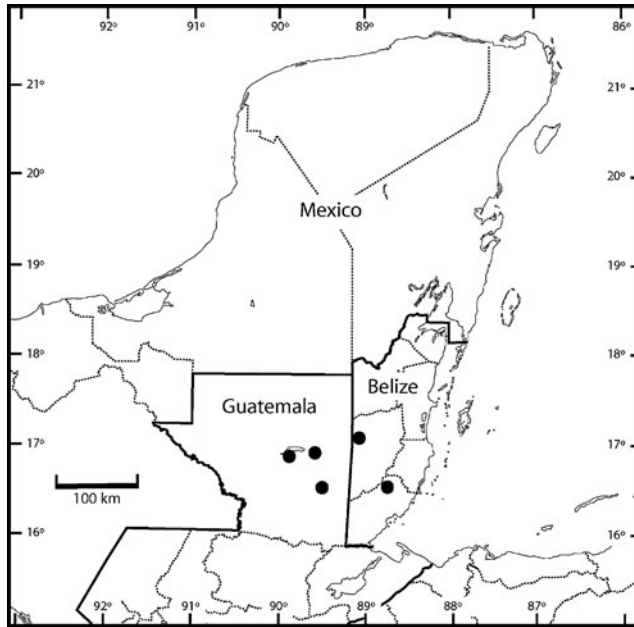


FIG. 2. Distribution of *Comocladia mayana* in Guatemala and Belize.

(Rubiaceae) and *Vitex gaumeri* Greenm. (Lamiaceae) (Atha, 2008). The species is expected on limestone outcrops in adjacent Mexico.

Several natural history observations of *C. mayana* were made by the first author while collecting this new species. The pollinator for *C. mayana* is unknown, but solitary ants were observed visiting the hundreds of individual flowers of a male inflorescence (Atha pers obs., 2007). Although all other species of the genus are notorious for causing contact dermatitis, among five people who have handled the plant (including the collectors of the type), none report any dermatological reaction to it.

Comocladia mayana is easily distinguished from species of *Comocladia* that occur nearby in Mexico and Central America including *C. engleriana* Loes., *C. guatemalensis* Donn. Sm., *C. macropylla* L. Riley, *C. mollissima* H.B.K., *C. palmeri* Rose and *C. repanda* S. F. Blake. The new species differs from the Mexican species *C. mollissima* in having entire leaflets rather than serrate or dentate leaflets. *Comocladia engleriana*, also from Mexico, has leaflet apices mucronate to emarginate and leaflets elliptic to ovate elliptic and therefore does not resemble *C. mayana*. *Comocladia guatemalen-*

sis occurs in arid habitats and is densely covered in golden to ferruginous trichomes and is thus easily distinguished. *Comocladia repanda*, *C. macropylla*, and *C. palmeri* from Mexico may be subtle variations of the same taxon and all have broadly crenate margins on obovate to oblong leaflets completely different from the leaflets of *C. mayana*. The *Comocladia* species that *C. mayana* most closely vegetatively resembles are the Jamaican endemics *C. pinnatifolia* L. (including *C. jamaicensis* Britton) and *C. cordata* Britton. However, the flowers of both of these species are trimerous and *C. mayana* has tetramerous flowers. A preliminary phylogeny of *Comocladia* suggests that *C. mayana* is sister to *C. engleriana* (Camacho & Pell, unpubl. dat.). However, sampling to date only includes nine of the approximately 20 species of *Comocladia*, although additional samples will be analyzed.

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Literature Cited

- Atha, D. E.** 2008. A new species of *Acalypha* (Euphorbiaceae: Acalyphoideae: Acalyphaceae) from Belize and adjacent Mexico and Guatemala. *Brittonia* 60: 185–189.
- Balick, M. J., M. H. Nee & D. E. Atha.** 2000. Checklist of the vascular plants of Belize, with common names and uses. *Memoirs of the New York Botanical Garden* 85: 1–246.
- Brewer, S. W., M. Rejmánek, M. A. H. Webb & P. V. A. Fine.** 2003. Relationships of phytogeography and diversity of tropical tree species with limestone topography in southern Belize. *Journal of Biogeography* 30: 1669–1688.
- Calonje, M.** 2009. A new cliff-dwelling species of *Zamia* (Zamiaceae) from Belize. *Journal of the Botanical Research Institute of Texas* 3: 23–29.
- Pell, S. K., J. D. Mitchell, T. Lobova & A. J. Miller.** 2011. Anacardiaceae. In K. Kubitzki (Ed.), *The Families and Genera of Vascular Plants*. Springer.