



A new species of *Acalypha* (Euphorbiaceae) from Guerrero, Mexico

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Abstract

Acalypha amithii is described and illustrated as a new species from the State of Guerrero, Mexico. Its distribution is restricted to the Pacific slope. *Acalypha amithii* is morphologically close to the Mesoamerican *A. ferdinandi* and the South American *A. stenoloba*. However, it can be distinguished from the former by number of teeth in the bracts of the pistillate flowers (13–15 vs. 7 in the new species) and from the latter by the degree of fusion of the sepals of the pistillate flowers (connate at the base vs. free in the new species). *Acalypha amithii* is characterized by a suffruticose habit, penninerved leaves, terminal or axillary pistillate inflorescences, sepals of the pistillate flowers completely free and ovate-lanceolate, bracts of the pistillate flowers cuneate at the base, styles glabrous and almost 12 times longer than the ovary.

Resumen

Acalypha amithii se describe e ilustra como una nueva especie para el estado de Guerrero, México. Su distribución está restringida a la vertiente del Pacífico. *Acalypha amithii* es cercana morfológicamente a la especie mesoamericana *A. ferdinandi* y a la sudamericana *A. stenoloba*. Sin embargo, se puede distinguir de la primera por el número de dientes en las brácteas de las flores pistiladas (13–15 vs. 7 en la nueva especie) y de la última por el grado de fusión de los sépalos de las flores pistiladas (connados en la base vs. libres en la nueva especie). *Acalypha amithii* se caracteriza por el hábito sufruticoso, hojas penninervadas, inflorescencias pistiladas terminales o axilares, sépalos de las flores pistiladas completamente libres y ovado-lanceolados, brácteas de las flores pistiladas con la base cuneada, estilos glabros y casi 12 veces más largos que el ovario.

Keywords: Acalyphoideae, diversity, Malpighiales, Neotropics

Introduction

Acalypha Linnaeus (1753:1003) is the third most diverse genus of Euphorbiaceae, with ca. 450 species (Webster 1994, Govaerts *et al.* 2000, Martínez-Gordillo *et al.* 2002, Cardiel *et al.* 2008), only after *Euphorbia* Linnaeus (1753: 450) and *Croton* Linnaeus (1753: 1004). It belongs to the subfamily Acalyphoideae, tribe Acalypheae (Webster 1994, Radcliffe-Smith 2001). *Acalypha* includes herbs to small trees, with trichomes that are generally simple; the stipules are often persistent; the inflorescences can be unisexual or bisexual; the bracts are persistent, and the pistillate bracts can be accrescent or non-acrescent; the flowers are unisexual, apetalous, with inconspicuous calyces having 3 to 5 sepals and slender, lacinate styles (Martínez-Gordillo *et al.* 2002).

Since its first establishment, *Acalypha* has undergone few changes in its circumscription, and it is currently considered monophyletic (Tokuoka 2007, Wurdack & Davis 2009). Baillon (1858) proposed to divide *Acalypha* into two sections (A and B), taking into account the presence of simple or compound inflorescences, and the number of

sepals in the pistillate flower. Later, Müller-Argoviensis (1865) recognized two sections, *Linostachys* (Klotzsch ex Schlechtendal 1846: 235) Müller-Argoviensis (1865: 6) and *Eucalypha* Müller-Argoviensis (1865: 8), which is an invalid name for the now autonomous section *Acalypha*. Section *Linostachys* unites species with pedicellate pistillate flowers and non-acrescent bracts in the fruit. On the other hand, section *Acalypha* includes more than 95% of the species of the genus and is characterized by the presence of sessile pistillate flowers and acrescent bracts in the fruit. Pax & Hoffmann (1924) provided another proposal for the infrageneric classification of the genus. The authors divided *Acalypha* into three subgenera, based on the sections recognized by Müller-Argoviensis (1865): *Eucalypha* (Müll. Arg.) Pax & Hoffmann (1924: 22)—now *Acalypha*—, *Linostachys* (Klotzsch ex Schltdl.) Pax & Hoffmann (1924: 13) and the monotypic *Androcephala* Pax & Hoffmann (1924: 21); these authors further divided the first two subgenera into “sections” and “series”; however, they were incorrectly ranked according to the International Code of Botanical Nomenclature and are invalid. After the classification of Pax & Hoffmann (1924) there have been other attempts to establish infrageneric classifications of *Acalypha* (e.g., Seberg 1984); however, they have not been widely accepted.

Close to 65% of the species of *Acalypha* are found in tropical America with Mexico being the center of diversity, harboring 126 species, 74 of them endemic (Martínez-Gordillo *et al.* 2002), and where subgenera *Acalypha* and *Linostachys* are represented. Despite this fact, there are no contemporary taxonomic studies of the genus in Mexico, since it is considered a taxonomically difficult group. However, some of its species are included in regional treatments (e.g., Standley 1923, McVaugh 1961, Rzedowski & Rzedowski 2001) and in checklists of the family (Govaerts *et al.* 2000, Martínez-Gordillo *et al.* 2002, Steinmann 2002).

In the treatment of Euphorbiaceae for the flora of Guerrero, we found specimens which could not be placed within any known species. Thus, they are here proposed as belonging to a new species of *Acalypha* subgenus *Acalypha*.

Taxonomy

Acalypha amithii Mart.Gord., Fragoso & K.Velasco *sp. nov.* (Fig. 1).

Diagnosis: Similar to *A. stenoloba* but differs from it by being a subshrub of up to 1 m tall, with axillary and terminal pistillate inflorescences, pistillate flowers with free ovate-lanceolate sepals, pistillate bracts with cuneate base, and styles glabrous, ca. 12 times longer than the ovary.

Type:—MEXICO. Guerrero: Mpio. San Luis Acatlán, Yoloxóchitl, paraje El Cacao Rojo, entrando por el Cerro Copete Chico, 576 m, 16°50'55.5714"N, 98°39'4.5714"W, 29 May 2017, K. Velasco G. 40441 (holotype: FCME!; isotypes: HUAP!, MEXU!, US!).

Subshrubs up to 1 m tall, monoecious; young branches thin, glabrescent, axillary buds densely hispid, trichomes simple and whitish, mature stems lenticellate; stipules persistent earlier reddish to dark brown, 2–9.6 cm long, subulate, pubescent, with antrorse trichomes; petioles thin, 1–5.5 cm long, pubescent, with antrorse trichomes; leaf blade (5–)10–22 × 1.2–6.7 cm, elliptic to elliptic-lanceolate, membranous; apex caudate, margin denticulate, base cuneate, lower surface glabrous, upper surface mostly glabrous, with trichomes dispersed on the nerves, venation pinnate, three-veined from the base. Inflorescences unisexual; staminate inflorescences 3.1–8 cm long, axillary, peduncle 4–7 mm long; pistillate inflorescences 4.5–6.1 cm long, axillary and terminal, peduncles thin, 0.7–1 cm long, pubescent, trichomes simple, antrorse, adpressed; pistillate bracts not fully developed, 2–2.8 mm long, sessile, acrescent, ovate, divided up to the middle, with ca. 7 unequal teeth, hispid with erect trichomes, 1–1.2 mm long, with spheric sessile glands. Staminate flowers pedicellate, perianth white-hyaline, sepals 4, ovate-lanceolate, buds less than 1 mm long. Pistillate flowers subsessile, sepals 3–4, 0.3–0.7 mm long, free, subulate, hispid; ovary densely pubescent, with trichomes simple, large, adpressed; styles 3, 6.3–7.4 mm long, free, lacinate, with laciniae 2–3 mm long, white, reddish when mature. Capsules and seeds not seen.

Distribution and ecology:—*Acalypha amithii* occurs in Guerrero, in the Pacific slope, growing along streams, at 576 m of elevation, in tropical subdeciduous forests, near the transition zone with *Pinus-Quercus* forests. It has been collected with flowers from April to May. During the field work, that encompassed the collection of all the other flowering plant species of the region, *A. amithii* was not observed growing in other areas. In the collection sites, the species formed groups of no more than 10 individuals, which suggest that its distribution range is narrow and its local abundance scarce. These factors combined with wood extraction and the expansion of agricultural and livestock activities seen in the region could potentially threaten the new species. However, a more detailed study to ascertain its conservation status is needed.

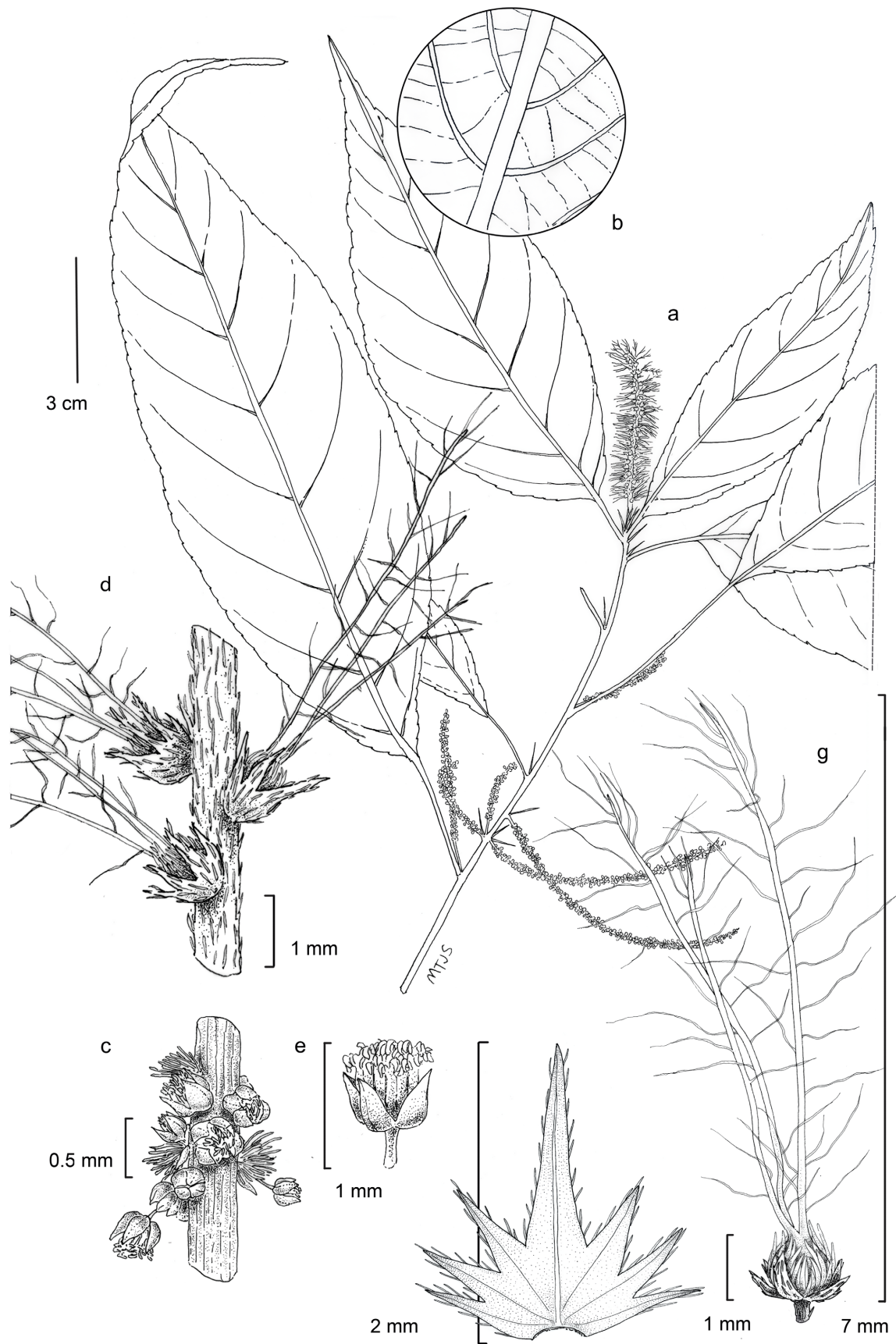


FIGURE 1. *Acalypha amithii*, a: Branch with terminal pistillate inflorescence and axillary staminate inflorescences; b: Close-up of the lower surface of the leaf, showing venation pattern; c: Close-up of the staminate inflorescence; d: Close-up of the pistillate inflorescence; e: Staminate flower; f: Immature bract of the pistillate flower; g: Pistillate flower. All drawn from *K. Velasco G. 40441* (FCME) by María Teresa Jiménez Segura.



FIGURE 2. *Acalypha amithii*, a: Plant in habitat; b: Branch with terminal pistillate inflorescence and axillary staminate inflorescences; c: Detail of the pistillate inflorescence; d: Detail of the staminate inflorescences [from K. Velasco G. 40441 (FCME)].

Etymology:—The new species is dedicated to Jonathan D. Amith, anthropologist and linguist who studies the Mixtec, Totonac, and Nahuatl languages and cultures, and who has especially dedicated himself to the ethnobiology of these communities in the states of Guerrero and Puebla.

Additional specimen examined (paratype):—MEXICO. Guerrero: San Luis Acatlán, Yoloxóchitl, en el paraje Cacao Rojo o Colorado, a 4.4 km en línea recta al NE de Yoloxóchitl, camino a Arroyo Cumiapa, 576 m, 16°50′43.6194″N, 98°39′25.8474″W, 22 April 2016, K. Velasco G. 40060 (FCME!, HUAP!, MEXU!, US!).

Taxonomic comments:—The new species belongs to subgenus *Acalypha* due to the presence of sessile pistillate flowers and accrescent pistillate bracts. The species that *Acalypha amithii* resembles the most morphologically is *A. stenoloba* Müller-Argoviensis (1872: 41), a Peru and Bolivia endemic, which thrives in the Amazonian and Andean regions (Cardiel 2007, 2013). Both species share the glabrous, petiolate, and penninerved leaves, unisexual inflorescences and pistillate bracts with 9 or less teeth. The new species differs from *A. stenoloba* in the habit, being a subshrub up to 1 m high (vs. shrubs or small trees up to 8 m high in *A. stenoloba*); the leaves have 9 or more pairs of lateral nerves (vs. 7); the pistillate inflorescences are terminal and axillary (vs. only terminal); the pistillate sepals are completely free from each other (vs. connate at the base) and their shape is ovate-lanceolate (vs. triangular); the pistillate bracts are cuneate at the base (vs. cordate at the base); the styles are glabrous (vs. puberulent) and almost 12 times longer than the ovary (vs. almost 5 times longer).

From the Mesoamerican species of *Acalypha*, *A. amithii* resembles *A. ferdinandi* Hoffm. (*in Pax & Hoffmann* 1924: 63) the most. Both species share the presence of simple trichomes in the vegetative organs and penninerved leaves. However, the new species differs from *A. ferdinandi* in the habit, being a suffruticose herb (vs. tree); the pistillate bracts have 7 teeth (vs. 13–15 teeth); the margin of the pistillate sepals is non-ciliate (vs. ciliate); the ovary surface is smooth and lacks glandular trichomes (vs. muriculate surface with glandular trichomes). Finally, the distribution of these species is different, *A. ferdinandi* is found in the Atlantic slope, while *A. amithii* is distributed in the Pacific slope.

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