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An overlooked new species of *Gomphrena* (Amaranthaceae) endemic to Mexico

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Abstract

Gomphrena medinae (Amaranthaceae), a new species from the states of Guerrero and Michoacán (Mexico), is described and illustrated. *G. medinae* is similar to *G. pringlei*, but it can be distinguished by the oblanceolate-spathulate to lanceolate leaves arranged towards the base, long-pedunculated inflorescences, involucral leaves shorter than the inflorescence, bracts shorter than the bractlets, and crest of the bractlets less than 1 mm wide.

Key words: Caryophyllales, Gomphrenoideae, Flora of Guerrero, Flora of Michoacán

Introduction

The genus *Gomphrena* Linnaeus (1753: 224) (Amaranthaceae Juss.) includes about 120–140 species, native to America and Australia (Stevens 2001 onwards, POWO 2025). Recent phylogenetic studies based on molecular data (Ortuño-Limarino & Borsch 2020) support the expansion of the circumscription of this genus to include *taxa* that were previously part of the genera *Philoxerus* Brown (1810: 416), *Lithophila* Swartz (1788: 14) and *Gossypianthus* Hooker (1840: 44).

Gomphrena is a difficult genus from the taxonomical point of view (*e.g.* Sánchez-del Pino *et al.* 2009, Sandoval-Ortega & Zumaya-Mendoza 2023b) and several known and accepted species are not still investigated in depth. Also, nomenclature of the genus is sometimes critical (*e.g.* Iamonico 2012, Iamonico & Sánchez-del Pino 2014).

Gomphrena includes subshrubs, perennial and annual herbs, with opposite leaves, bisexual flowers, with five stamens, filaments connated into a tube, a single style and usually two filiform stigmas; species are native to the New World tropics and subtropics and Australia (Clemants 2003, Ortuño-Limario & Borsch 2020, POWO 2025).

This group is mostly diverse in South America (Bolivia, Argentina, Brasil) and Australia (Ortuño-Limarino & Borsch 2020). In North America, 17–20 species are reported (Standley 1917, Clemants 2003, Villaseñor 2016), and about 15 native species were reported for the Mexican flora (Villaseñor 2016, Sandoval-Ortega & Zumaya-Mendoza 2023b).

As part of the ongoing study of the flora of Guerrero (Mexico) (see *e.g.* Fonseca & Medina-Lemos 2012, Fonseca 2022) and the taxonomic revision of the family Amaranthaceae of Mexico (Sandoval-Ortega & Zumaya-Mendoza 2023a, 2023b), we consulted herbarium specimens of *Gomphrena* deposited in the main Mexican Herbaria and noticed that some specimens did not match any of the species previously described for the country. These specimens (collected from central Mexico) are, therefore, ascribed to a new species of *Gomphrena*.

Material and methods

From February 2023 to August 2024, the material of the genus *Gomphrena* deposited in the Herbaria, ENCB, FCME, and MEXU (acronyms follow Thiers (2025 [continuously updated]) was directly observed and examined.

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A distribution map was prepared using QGIS program (QGIS.org 2024), and the coordinates from the specimens, for the material that did not have this information, coordinates were assigned based on the collection location using *Google Earth*.

Results and discussion

Gomphrena medinae Zumaya-Mendoza S. & Sandoval-Ortega M.H., *sp. nov.* (Fig. 1).

Type:—MEXICO. Michoacán, Churumuco, Ejido Llano Ojo de Agua, 18°42'3.84"N 101°38'44.57"W, bosque tropical caducifolio, 431 m, 3 October 2013, *Hernández & Sánchez 98* (holotype MEXU1409246; isotype MEXU1452787).

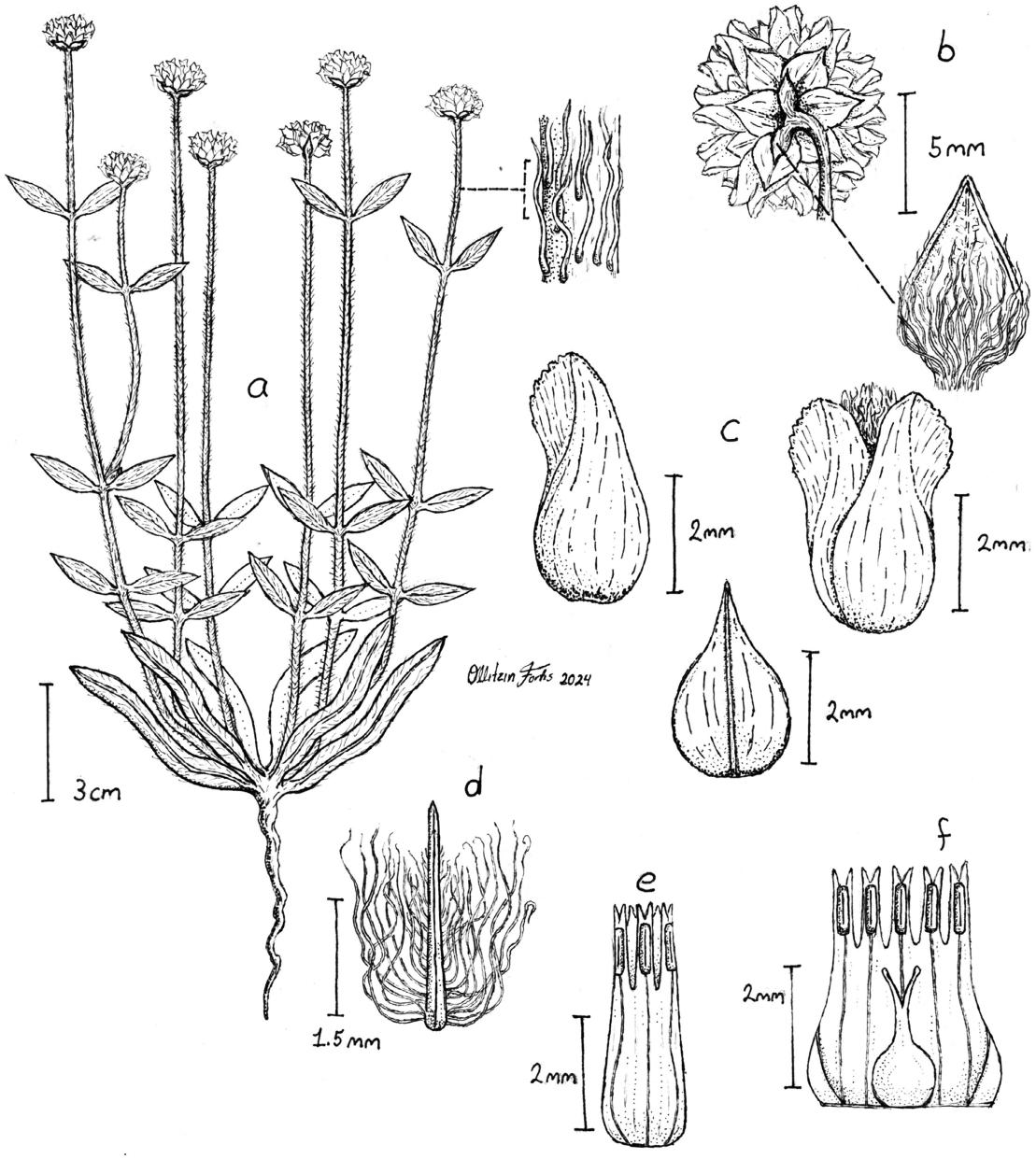

FIGURE 1. *Gomphrena medinae*. **a.** Habit, **b.** Inflorescence with involucral leaves, **c.** Flower with bract and bractlets, **d.** Tepal, **e.** Staminal tube, **f.** Interior view of the staminal tube with gynoecium and stigma. Drawn from the type specimens by Ollitzin Fortis.

Diagnosis:—*Gomphrena medinae* is similar to *G. pringlei* Coulter & Fisher (1892: 349), but it can be distinguished by the oblanceolate-spathulate to lanceolate leaves arranged towards the base, 1.5–4.6 cm long (*vs*. oblong-lanceolate

leaves, 1.0–2.0 cm long), inflorescences reddish to magenta, supported by a long peduncle and subtended by involucral leaves shorter than the inflorescence, 0.2–0.3 cm long (*vs*. involucral leaves equal to slightly longer than the inflorescence, 0.9–1.0 cm long) , bracts close to ½ the size of the bractlets (*vs*. bracts almost the same size of the bractlets), bractlets crest width 0.5–0.6 mm (*vs*. 1.5–2.0 mm).

Description:—Herbs annual, up to 30 cm tall; stems erect, ascending, 8–30 cm long, pilose, trichomes 1.5 mm long, appressed, uniseriate, multicellular, with 3 to 6 cells, the last one towards the apex is the longest, armed. **Leaves** opposite, arranged towards the base, petioles inconspicuous, blades oblanceolate-spatulate to lanceolate, 1.5–4.6 × 0.2–0.6 cm, base long decurrent, margin entire, apex mucronate, adaxial surface pilose to glabrescent, abaxial surface densely hairy, with long appressed trichomes similar to those of the stem. **Inflorescences** globose, terminal, solitary, 1.0–1.5 × 0.5–1 cm, supported by 2 involucral leaves shorter than the inflorescence, 2–3 × 1.0–1.5 mm, light green on the adaxial surface and pale green on the abaxial surface, ovate-lanceolate, sessile, base long excurrent, upper and lower surface pilose with long trichomes, peduncles 3–17 cm long. **Flowers** hermaphrodite, bract 1 broadly ovate, membranous, hyaline and glabrous, reaching more or less half the length of the bractlets, 3 × 1.3–1.8 mm, middle vein evident, long excurrent towards the apex; bractlets 2, crested, cymbiform, lanceolate, membranous, glabrous, reddish to magenta, longer than the tepals, 5.5–6.3 × 2.2–2.6 mm wide, the crest prolonged from the apex to above the middle, 0.5–0.6 mm wide, toothed; tepals 5, unequal, oblong-linear, 3 × 0.2–0.3 mm, scarious to membranous towards margin and apex, margin entire, 1-veined; trichomes white, undulated and simple, arranged from the base and decreasing in size towards the apex, up to 6 mm long; **androecium** with filaments fused into a staminal tube 3.2–4.0 mm long, lobes 5, 1.0 mm long, apex bifid alternating with a cleft, anthers 1.0–1.3 mm long; **gynoecium** with subglobose ovary, 1.0–1.5 mm diameter; style 0.6–1.8 mm long; stigma formed by two filiform branches 0.2–0.7 mm long. **Fruit** a utricle 1.6–2.4 × 1.0–1.8 mm. **Seed** oblong, brown, 1.0–1.2 mm diameter.

Etymology:—The new species is named after Rosalinda Medina Lemos, Mexican botanist, academic technician of the Instituto de Biología de la Universidad Nacional Autónoma de México and editor of "Flora del Valle de Tehuacán-Cuicatlán" who has made great contributions to the study of the Mexican flora (see e.g. Medina-Lemos 2008, 2009, 2013, 2022, Medina-Lemos & Fonseca 2009).

Distribution and habitat:—*Gomphrena medinae* grows in subtropical deciduous forest and secondary vegetation (derived from subtropical deciduous forest) in the Balsas Basin biogeographic province, states of Guerrero and Michoacán (Fig. 2), between 125 to 500 meters a.s.l.

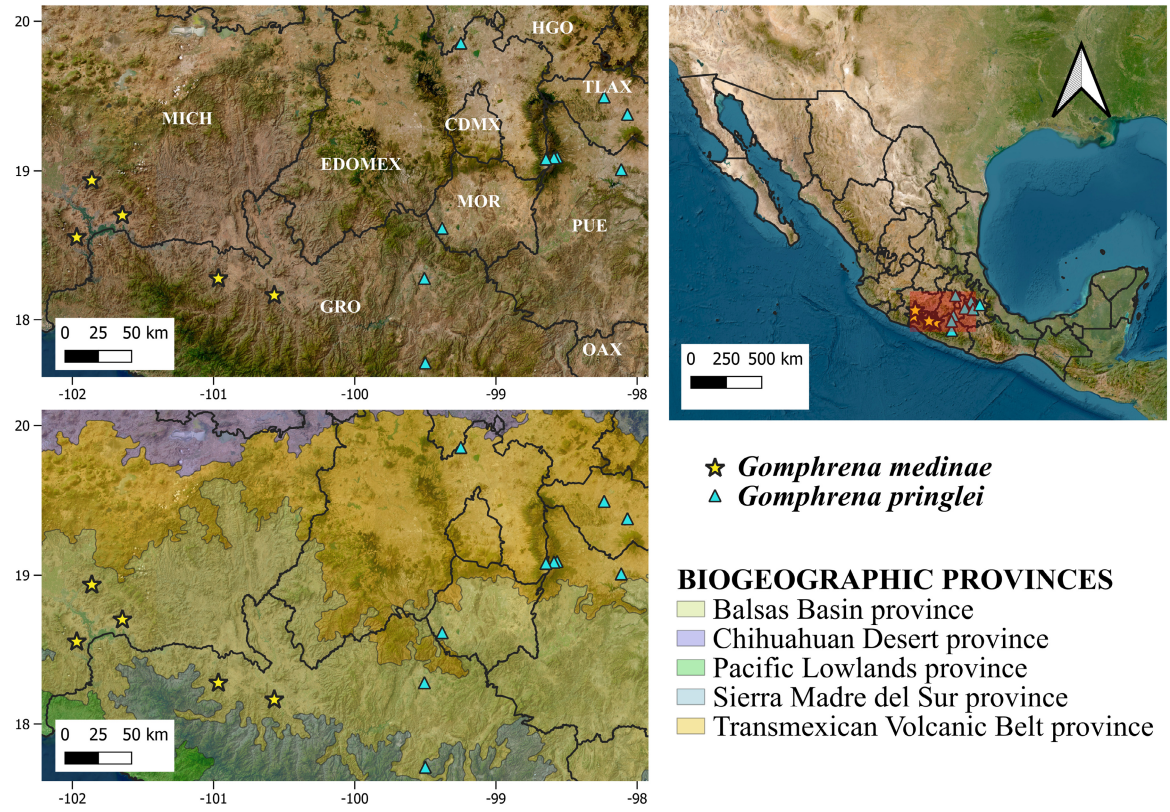

FIGURE 2. Distribution of *Gomphrena medinae* and *G. pringlei*. States: CDMX= Ciudad de México, EDOMEX= Estado de México, GRO= Guerrero, HGO= Hidalgo, MICH= Michoacán, MOR= Morelos, OAX= Oaxaca, PUE= Puebla, TLAX= Tlaxcala.

Phenology:—Flowering and fructifying from July to December.

Conservation status:—*Gomphrena medinae* is known only from five localities between the states of Guerrero and Michoacán, in the Balsas River basin. However, it is possible that this species has a wider distribution, since it occurs in secondary vegetation and even close to urban areas. Anyway, more extensive studies on the species are required to determine its conservation status. Therefore, following the guidelines of the IUCN criteria (IUCN 2025), *G. medinae* is assessed as Data Deficient (DD).

Notes:—Specimens of *Gomphrena medinae* have been identified as *G. pringlei* for a long time. However, after consulting the protologue *G. pringle* (Coulter & Fisher 1892) and the two isolectotypes of *G. pringlei* deposited in MEXU (barcodes MEXU00012331 and MEXU00012330; see Sandoval-Ortega & Zumaya-Mendoza 2023b). We confirm that the material here referred does not correspond to any previously described species. *G. medinae* can be differentiated from *G. pringlei* by several morphological differences (see diagnosis above, as well as Table 1 and Fig. 3).

TABLE 1. Morphological comparison between *Gomphrena pringlei* and *G. medinae*.

	G. pringlei	***G. medinae***
Stems	Procumbent	erect
Number of leaves supporting the inflorescence (bracts)	two to three	two
Inflorescence bracts size (cm)	0.9–1.0	0.2–0.3
Inflorescence length (cm)	0.5–0.8	1.0–1.5
Leaf shape	oblong-lanceolate	oblanceolate-spatulate to lanceolate
Leaf length (cm)	1.0–2.0	1.5–4.6
Bract length (mm)	4.2	3.0
Bractlets length (mm)	4.5–4.8	5.5–6.3
Bractlets crest width (mm)	1.5–2.0	0.5–0.6
Tepals length (mm)	4.0–4.5	3.0
Staminal tube length (mm)	4.0	3.2–4.0

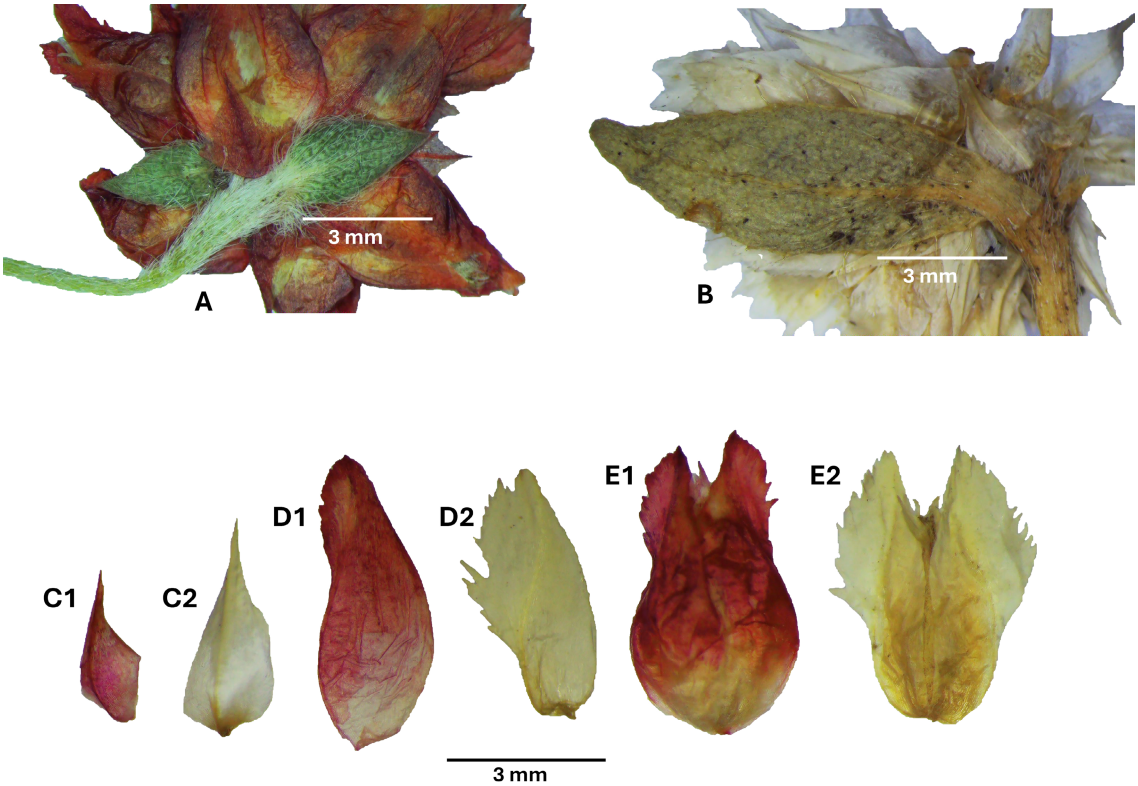

FIGURE 3. Detail of different structures of the inflorescence of *Gomphrena medinae* and *G. pringlei*. A) involucral leaves in inflorescence of *G. mediane*. B) involucral leaf of *G. pringlei*. C1) bract of *G. medinae*. D1) bractlet of *G. medinae* E1) bractlets enclosing the flower of *G. medinae*. C2) bract of *G. pringlei*. D2) bractlet of *G. pringlei*. E2) bractlets enclosing the flower of *G. pringlei*.

Additional examined material (paratypes):—MEXICO. Guerrero: Ajuchitlán del Progreso, Cerro La Parotita de la localidad San Antonio de los libres, 18°9'46.9"N 100°34'11.5"W, 10 July 2014, *Chamu 186* (MEXU1439696); Zirándaro, Placeres del Oro, 8.44 km al N, 18°16'35"N 100°57'57"W, 26 August 1999, *Calónico, Mayorga & Armando 15697* (MEXU1004848). **Michoacán:** Arteaga**,** Carretera Nueva Italia-Playa Azul, en la desviación al infiernillo, 18°33'10.5"N 101°58'07.9"W, 17 September 1979, *Soto & Silva 1625* (MEXU303774); La Huacana, 7 km al W de La Huacana, sobre la carretera a Cuatro Caminos, 18°56'06.1"N 101°51'44.3"W, 18 October 1975, *Rzedowski 33683* (MEXU396272).

***Gomphrena pringlei* examined material:—MEXICO**. **Estado de México:** State of Mexico, 26 August 1890, *Pringle 3152* (MEXU); Huehuetoca, Extremo NE del Cerro Sincoque, 14 August 1986, *Rzedowski 40330* (MEXU). **Guerrero:** Coahuayutla de Guerrero, La Corva, 5.46 km al N, 20 October 1999, *Cálonico 17664* (FCME); Huitzuco de Figueroa, 5 km al W de Tepecoacuilco de Trujano, 2 October 1981, *Perea s.n.* (FCME). **Morelos:** Amacuzac, Al Noreste de Amacuzac, 27 August 1986, *De La Cruz 1255* (MEXU). **Puebla:** Cholula, La Ventana camino lado Poniente de Santiago Xalitzintla, 22 September 1987, *Tlapa & Ubierna 539* (MEXU); Cholula, Villa turistica Buenavista, por el lado Noroeste de Santiago Xalitzintla, 8 September 1987, *Tlapa & Ubierna 369* (MEXU); Cholula, Camino a Paso de Cortes, por el lado Poniente de Santiago Xalitzintla, 15 September 1987, *Tlapa & Ubierna 482* (MEXU); Parque Estatal Gral. Lázaro Cárdenas, 16 August 1994, *Martínez Romero 403* (MEXU); San José Chiapa, Cerro Aproximadamente a 1 km al E del Carmen, por la carretera Acajete-Oriental, 10 November 2006, *Contreras 8518* (FCME). **Tlaxcala:** Domingo Arenas, San José Techopa, 26 September 1988, *Santacruz 428* (MEXU).

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