

# A NEW SPECIES OF *CHAPTALIA* (ASTERACEAE: MUTISEAE) FROM MEXICO AND REDISCOVERY OF *CHAPTALIA MEXICANA*

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## ABSTRACT

A new species, ***Chaptalia hidalgoensis*** L. Cabrera & Nesom, is described and illustrated. It is known only from the type collection made in Mun. Zimapan, Hidalgo. The occurrence of *Chaptalia mexicana* Burkart is documented here, with description and illustration, apparently for the first time since the type was collected by Ehrenberg in 1840. The recent collection was made in Mun. Pinal de Amoles, Querétaro. Both of these Mexican species appear to be members of sect. *Chaptalia*.

## RESUMEN

Una nueva especie, ***Chaptalia hidalgoensis*** L. Cabrera & Nesom, se describe e ilustra; ésta se le conoce únicamente de la colección tipo del Mun. Zimapan, Hidalgo. También documentamos la existencia de *Chaptalia mexicana* Burkart, proporcionando una descripción completa e ilustración; aparentemente esta especie no se había vuelto a coleccionar desde la colecta tipo de Ehrenberg en 1840. Esta colección reciente es del Mun. Pinal de Amoles, Querétaro. Ambas especies mexicanas parecen ser miembros de la sección *Chaptalia*.

Research by the first author toward a treatment of Mutisieae of the Bajío region of México has brought to light two interesting discoveries in *Chaptalia* Vent. A new species is described, and the first known collection of *C. mexicana* Burkart since its initial discovery in 1840 is documented.

***Chaptalia hidalgoensis*** L. Cabrera & Nesom, sp. nov. (**Fig. 1**). TYPE: MEXICO. HIDALGO: Mun. Zimapan. Verdosas, bosque de pino, encino y *Juniperus*, 1750 m, 20 Nov 1991, V.M. Huerta 1352 (HOLOTYPE: IEB!).

*Chaptaliae lyratifoliae* et alio sect. *Chaptaliae* similis flosculis centralibus fungenter staminatis—differt ab omnibus coniunctione rhizomatum, scaporum bracteatorum, foliorum coriaceorum lyratorum, flosculorum pistillatorum interiorum numerosorum, et acheniorum non rostratorum; differt a *C. lyratifoliae* scapis bracteatis, phyllariis marginibus glandulosis, flosculis pistillatis exterioribus paucioribus ac flosculis pistillatis interioribus multo paucioribus, et flosculis bisexualibus corollis brevioribus.

**Plants** perennial, fibrous-rooted, rhizomatous. **Leaves** coriaceous, 3–5 cm long, blades 1.5–3.6 cm long, 1.1–2.1 cm wide, elliptic-oblong to ovate, lyrate, with an ovate to ovate-cordate terminal portion and 1(–2) pairs of basal lobes, margins

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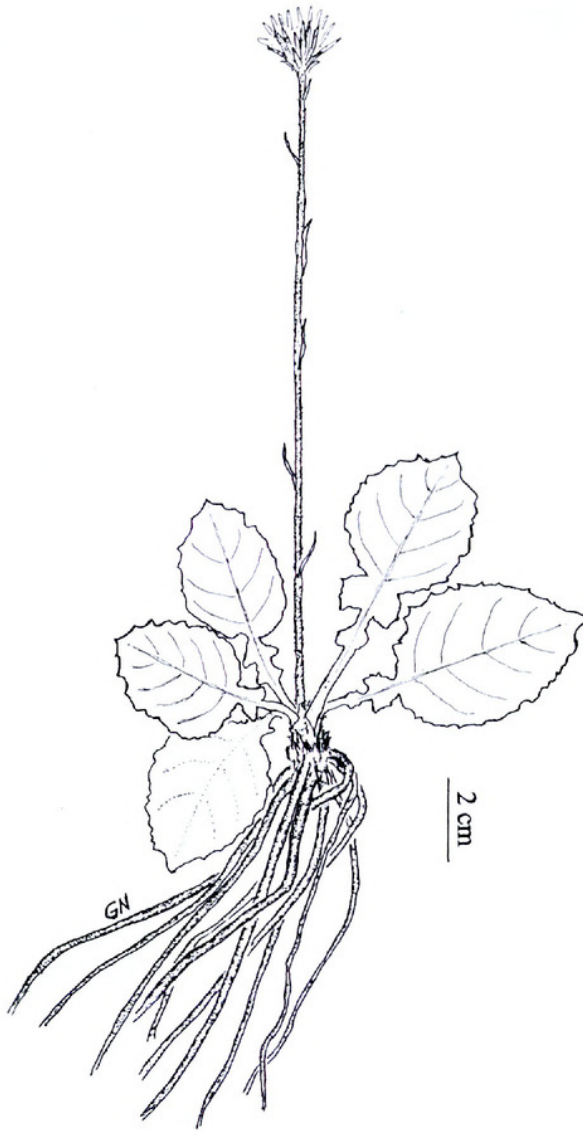


FIG. 1. Habit of *Chaptalia hidalgoensis*, from the type.

crenate to denticulate, revolute, apex acute to obtuse and mucronate, the base cordate, lower surface white-gray tomentose, upper surface villous-arachnoid, glabrescent. **Scapes** 1–3 per plant, 8–12 cm tall, villous to almost glabrous, tomentulose close to the head, 6–9-bracteate, bracts linear-lanceolate, 3–5.2 mm long, also with 3 bract-like phyllaries close to or subtending the involucre (i.e., bracts transitional to phyllaries). **Heads** solitary, 1.1–1.7 cm tall, 1.4–1.8 cm wide; involucre turbinate, 0.8–0.9 cm tall, phyllaries 3-seriate, green, herbaceous, all acute, scarious at the margins, with the distal area usually dark-red, the dorsal surface somewhat arachnoid, soon glabrous, the outermost linear-lanceolate, ca. 2.8 mm long, 0.5–0.7 mm wide, margins sparsely glandular, the central lanceolate, 4–5.2 mm long, 0.8–1 mm wide, margins sparsely glandular, the innermost ca. 8 mm long, ca. 1 mm wide, margins glabrous. **Florets** trimorphic—outer



pistillate and ligulate, *middle* pistillate with reduced ligules, *inner* bisexual and tubular-bilabiate: **outer florets** 15–21 in 1 series, ligules white-cream in color, sometimes somewhat purple with age, with an abaxial purplish midstripe at maturity, 10 mm long, ca. 1 mm wide, the tube 2.8 mm long, the inner lips 1–3, filamentous, 1–1.2 mm long, the style 5.2 mm long, including the branches 0.2–0.3 mm long; **middle florets** ca. 7, ligules ca. 6 mm long, ca. 0.4 mm wide, the tube almost as long as the ligule, inner lip absent; style 6 mm long including the ca. 0.5 mm long branches; **inner florets** ca. 22, corollas bilabiate, creamy in color, 7 mm long, including the 5 mm long tube and the recurved lobes 2–3 mm long; stamens 4.5 mm long, appendage 1.5 mm long, tails ca. 1.2 mm long, thecae ca. 1.8 mm long. **Achenes**: (outer pistillate florets) immature but apparently fertile, ca. 2 mm long, papillose over whole surface, cylindric; pappus biseriate, ca. 5 mm long; (inner pistillate florets) fertile, ca. 2.5 mm long, fusiform, apparently not beaked, papillate; pappus uniseriate, 5–5.5 mm long; (bisexual florets) sterile, ca. 2 mm long, cylindric, with few hirsute hairs; pappus biseriate, 6.2 mm long. Known only from the type collection, where it was reported as scarce.

*Chaptalia hidalgoensis* (as well as *C. mexicana*, below) appears to be a member of sect. *Chaptalia*, as outlined by Nesom (1995)—recognized by the production of functionally staminate (pseudo-bisexual) central florets, ligules of the outer pistillate florets with a purplish, abaxial midstripe at maturity, and heads nodding in bud. Previously, only one of the six species of sect. *Chaptalia* was known to produce consistently bracteate scapes—both of the species discussed in the present manuscript have bracteate scapes. The behaviour of the heads in the two species treated here in detail is inferred from their putative relatives.

Within sect. *Chaptalia*, *C. hidalgoensis* mostly closely resembles *C. lyratifolia* Burkart in its coriaceous and lyrate leaves. One of the plants of the Huerta collection shows production of short rhizomes (the other plant collected without any below-ground parts) and because of the similarities of *Chaptalia hidalgoensis* to *C. lyratifolia*, which characteristically is colonial through production of creeping or stoloniform rhizomes, it seems probable that *C. hidalgoensis* also has a colonial habit. A summary of distinctive contrasts of the new species with *C. lyratifolia* is given in the key below (following comments on *C. mexicana*). The latter species is distributed from central Nuevo León and adjacent Coahuila and Tamaulipas into central San Luis Potosí.

#### **Rediscovery of *Chaptalia mexicana***

*Chaptalia mexicana* Burkart was described and illustrated (Burkart 1944) from a single collection, cited below. A more recent collection from Querétaro is the second known and documents its continued existence, although the species, which was inadvertently omitted in Nesom's review of the North American and Central American species (1995), apparently is rare elsewhere.



**Chaptalia mexicana** Burkart, Darwiniana 6:543. 1944 (**Fig. 2**). TYPE: MEXICO. [No other locality data], 1840, *Ehrenberg 1042* (HOLOTYPE: B, fide Burkart 1944).

Recent collection: **MEXICO. Querétaro:** Mun. Pinal de Amoles, más o menos 2 km al N de Puerto de Tejamanil, bosque de encino, ladera de cerro, cañada, 2400 m, 27 Mar 1989, *E. Carranza 1571* (IEB). The sheet includes three plants.

**Plants** perennial, fibrous-rooted, producing rhizomes at least to 1.4 cm long. **Leaves** 3.5–9.2 cm long, dissected into 5–7 pairs of somewhat retrorse lobules, these increasing in size distally, the terminal lobe 1.6–3 cm long, 1.1–2.1 cm wide, ovate to ovate lanceolate, with the margins retrorse-crenate, the lower surface gray-white tomentose, the upper surface dark-green with red-tinges, lightly villous to glabrous with age, the midvein very prominent, villous-tomentose, dark red, becoming white-tomentose distally; petioles 0.8–1.5 cm long, winged, white-villous. **Scapes** 1–2 per plant, 4–10.5 cm tall, white-tomentose, (2–)4–6[8–10]-bracteate, bracts linear-lanceolate to trullate, 4–5.5 mm long, 0.5–0.8 mm wide. **Heads** solitary, 1.4–2 cm tall, 1.1–1.8 cm wide; involucre 0.9–1.3 cm tall, turbinate-campanulate, phyllaries 3-seriate, acuminate, the outermost red-dark, somewhat herbaceous, linear-lanceolate, 4–5.5 mm long, 0.5–0.8 mm wide, scarious at the margins, arachnoid on the dorsal surface, the central red-dark to green, somewhat scarious, lanceolate, 10–11 mm long, ca. 1 mm wide, scarious on the margins, somewhat villous on the dorsal surface, the innermost more or less scarious to somewhat greenish, lanceolate, 12–13 mm long, ca. 1 mm wide, glabrous dorsally. **Florets** trimorphic—*outer* pistillate and ligulate, *middle* pistillate with reduced ligules, *inner* bisexual and tubular-bilabiate: **outer florets** 15–17 in 1 series, ligules white-cream, with an abaxial purple midstripe when mature, [7]12–14 mm long, 1.1–1.8 mm wide, the tube 3–3.5 mm long tube, the inner 2 lips ca. [1]1.5–2.1 mm long, filamentous; style ca. 5.8–8 mm long, including the [0.6]0.2 mm long branches; **middle florets** 7 mm long, 0.7 mm wide, the tube 2.5–3 mm long, inner lip ca. 0.5 mm long; style 8 mm long including the ca. 0.2 mm long branches; pappus 5 mm long; **inner florets** 17–20, 8.5 mm long, the tube ca. 4.5 mm long, the semi-erect to recurved lobes ca. 4 mm long; stamens ca. 6 mm long, the filaments 2 mm long, the tails ca. 1.2 mm long, the appendage ca. 1.5 mm long, thecae ca. 2.5 mm long, fertile. **Achenes:** (outer pistillate florets) fertile, ca. 3–4 mm long, fusiform, papillose; pappus biseriate, 4–7 mm long; (inner pistillate florets) fertile, 3.5 mm long, fusiform, apparently not beaked, sparsely papillose, pappus 5 mm long; (bisexual florets) sterile, ca. 3 mm long, narrowly cylindric, glabrous; pappus uniseriate, 8 mm long. Square brackets [ ] enclose data from Burkart description.

The scape of the Ehrenberg type of *Chaptalia mexicana* (as illustrated by Burkart) appears to have 8–10 bracts, vs. (2–)4–6 in the recent Carranza collection, and several other measurements in Burkart's description vary from the recent collection, but the combination of bracteate scapes and the highly dis-

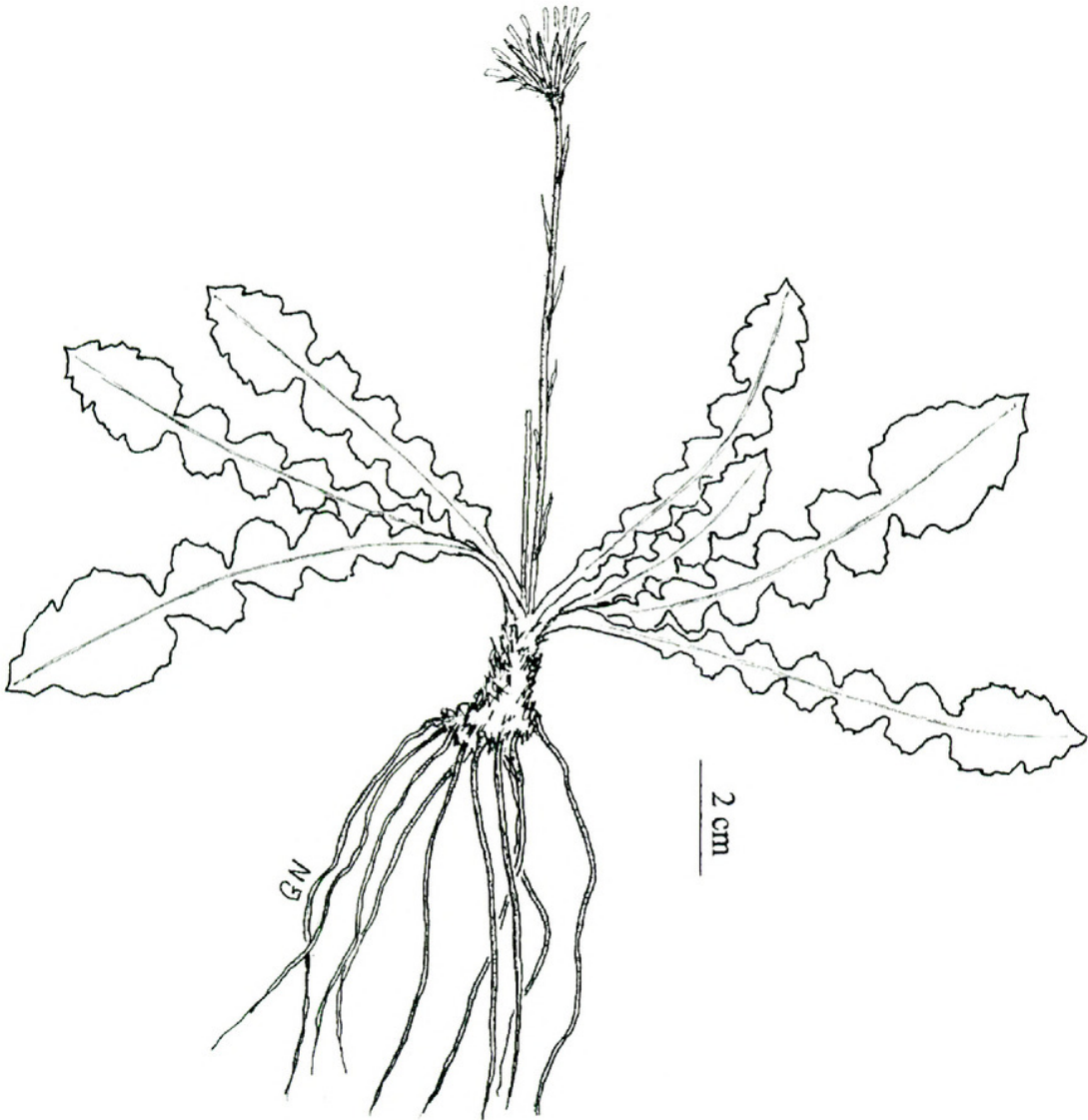


FIG. 2. Habit of *Chaptalia mexicana*, from Carranza 1571.

sected leaves is so remarkable that it is difficult to conclude that these are not the same species.

To arrive at an identification of *Chaptalia mexicana* using Burkart's key (1944, p. 524), which places the species in sect. *Lieberkuhna*, one must follow the choice "Flores centrales hermafroditas" (vs. "Flores centrales del capítulo masculinas, con ovario atrofiado."). His protologue for the species described "flores centrales hermafroditas" (p. 544), but he explicitly noted further down in the description that he did *not* see the achenes (probably meaning mature achenes, since his illustration included essentially similar ovaries at the base of each of the three kinds of corollas). It seems clear that Burkart would have placed this species in his sect. *Euchaptalia* if he had observed central florets



with sterile achenes. Our observation is that ovaries of the central (pseudo-bisexual) florets of *Carranza 1571* are glabrous and remain narrowly cylindric, while those of the pistillate florets are papillose and swell with the production of embryos.

Ehrenberg's type collection apparently did not include rhizomes, and the rhizomes on the Carranza collection are short, but because of the similarities of *C. mexicana* to *C. lyratifolia* and *C. estribensis* (leaves coriaceous and lyrate to cordate; style branches U-shaped, see comments below), it seems likely that the former also is colonial through production of creeping or stoloniform rhizomes.

#### KEY TO THE SPECIES OF SECT. *CHAPTALIA*

1. Leaves basally attenuate, not lyrate; plants without rhizomes, occurring individually.
  2. Scapes bracteate; pistillate florets in 1 series, prominently ligulate; fertile achenes with a short, slightly constricted neck. \_\_\_\_\_ ***Chaptalia pringlei*** Greene
  2. Scapes ebracteate; pistillate florets in 2 series, those of the outer series ligulate, those of the inner series with ligules absent or greatly reduced; fertile achenes with a nearly filiform beak.
    3. Leaves oblanceolate-spatulate, with a narrowly attenuate petiolar region; fertile achenes 6–9 mm long, including the slender neck 1/2–1/2 as long as the achene, sparsely papillate over the whole surface. \_\_\_\_\_ ***Chaptalia madrensis*** Nesom
    3. Leaves elliptic to elliptic-obovate, without a petiolar region; fertile achenes 3.5–5.2 mm long, including the slender neck 1/4–1/5 as long as the achene, glabrous except for the sparsely papillate neck region. \_\_\_\_\_ ***Chaptalia tomentosa*** Vent.
1. Leaves basally cordate and/or distinctly lyrate; plants rhizomatous and colonial.
  4. Leaf blades thin-herbaceous, sometimes reddish. \_\_\_\_\_ ***Chaptalia hintonii*** Bullock
  4. Leaf blades thick-coriaceous, not reddish.
    5. Leaf blades cordate, without lyrate extensions, with orange-tawny vestiture on the abaxial surface. \_\_\_\_\_ ***Chaptalia estribensis*** Nesom
    5. Leaf blades cordate to truncate at base, distinctly lyrate, with white vestiture on the abaxial surface.
      6. Leaves dissected into 5–7 pairs of somewhat retrorse, roughly equal-sized lobules; scapes bracteate. \_\_\_\_\_ ***Chaptalia mexicana*** Burkart
      6. Leaves lyrate, usually with one terminal primary lobe and 0–2(–4) smaller basal lobules; scapes bracteate or ebracteate.
        7. Scapes bracteate; phyllary margins sparsely glandular; outer pistillate florets 15–21, inner lip 1–1.2 mm long; middle florets (pistillate) ca. 7, fewer than outer; corollas of bisexual florets 7 mm long. \_\_\_\_\_ ***Chaptalia hidalgoensis*** Cabrera & Nesom
        7. Scapes ebracteate; phyllary margins eglandular; outer pistillate florets 24–38, inner lip absent or less than 0.5 mm long; middle florets (pistillate) often more than 90, usually 3× more numerous than outer; corollas of bisexual florets 9–12 mm long. \_\_\_\_\_ ***Chaptalia lyratifolia*** Burkart

#### Generic placement

Katinas (1998) transferred *Chaptalia hintonii* to the genus *Gerbera* Gmel., which otherwise (except for one South American species) has been recognized

only from Africa and Asia. Her rationale for the transfer emphasized the production of staminodes on the outer pistillate florets of *C. hintonii*, a feature characteristic of *Gerbera* but usually not of *Chaptalia*, and the “U-shaped” style branches of *C. hintonii*. We acknowledge that generic limits among taxa of the *Gerbera* complex are somewhat ambiguously drawn and may yet require taxonomic adjustments, but it does seem clear that *C. hintonii* is a member of the group of five species within sect. *Chaptalia* (as recognized here) characterized by production of stolons and cordate to lyratifoliate leaves (*C. estribensis*, *C. hidalgoensis*, *C. hintonii*, *C. lyratifolia*, and *C. mexicana*). All species of this group also produce the U-shaped style branches. Style branches are more slender and “V-shaped” in the three species of sect. *Chaptalia* with basally attenuate leaves and without stolons (*C. madrensis*, *C. pringlei*, and the type of the genus, *C. tomentosa*)—the style branch morphology is more like that of species of sect. *Leria* (DC.) Burkart, which includes *C. nutans* (L.) Polak., *C. texana* Greene, and others. The similarities of *C. tomentosa* and its two closest relatives to the five others here placed in sect. *Chaptalia*, and the apparent geographic integrity of the whole group, are taken here as evidence of close evolutionary relationship (Nesom 1995). A more detailed discussion of this problem is presented in a pair of papers by Katinas and Nesom (submitted).

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