

- 1 Plants annual or biennial; mid-cauline leaves sessile or petiolate, either the base of the blade or the base of the petiole auriculate-clasping; pappus absent on ray flowers, present on disk flowers *Heterotheca subaxillaris*
 Found in various more or less mesic habitats in west-central to southwestern New Mexico, in sandy habitats of eastern New Mexico, and at scattered sites in between. The lowest cauline leaves, often senesced by flowering, are petiolate with the base of the petiole auriculate-clasping and the blade ovate, 1–1.5 times longer than wide. The middle cauline leaves are sessile and auriculate-clasping at base, oblong to narrowly ovate, 2–4 times longer than wide, sometimes narrowed toward in the basal quarter or so between the auricles and the main body of the blade. The distal cauline leaves are sessile, ovate, cordate to auriculate-clasping at base. Some treatments separate *Heterotheca psammophila* and *Heterotheca subaxillaris* based on features of the leaves. While plants seem to vary somewhat in how far up the stem transition points between the three leaf morphologies described above occur, I don't think separating species is tenable.
- 1 Plants perennial; mid-cauline leaves sessile or petiolate but never auriculate-clasping; pappus present on both ray and disk flowers
- 2 Plants prominently glandular on the stems and leaves, often on the phyllaries as well; eglandular pubescence relatively sparse, not obscuring the glands
- 3 Eglandular pubescence of both stems and leaves almost exclusively strigose, tightly appressed; cauline leaves narrowly oblanceolate, 2–4 mm wide; plants of sandstone outcrops in the northwest corner of the state *Heterotheca polothrix*
 A very distinctive slickrock plant, in many-stemmed clumps with small, widely spaced leaves. Apparently peripheral in New Mexico, more common to the northwest.
- 3 Plants not as above; either eglandular pubescence primarily spreading, or cauline leaves wider, or in different habitats elsewhere in the state
- 4 Stems, leaves, and phyllaries all stipitate-glandular; heads not subtended by leafy bracts equalling or exceeding the phyllaries; plants of cliffs and steep rocky canyons in southwestern New Mexico *Heterotheca viscida*
 Most likely to be confused in habitat and appearance with *Heterotheca arizonica*. That species has clustered, prominently bracteate heads.
- 4 Plants sessile-glandular, or when stipitate-glandular in part then either the heads subtended by leafy bracts equalling / exceeding the phyllaries or at least the phyllaries without stipitate glands; plants of various habitats throughout the state, including rocky areas of the southwest
- 5 Eglandular pubescence of the stems 2-storied, both short, strigose trichomes and longer, spreading trichomes abundant; eglandular pubescence of the leaves loosely strigose; distal cauline leaves not or only very sparingly ciliate; heads not immediately subtended by leafy bracts *Heterotheca hirsutissima*
 The typical form of this species has pubescence predominately eglandular. Nesom mentions a collection from El Malpais, Cibola County with "the habit of *Heterotheca hirsutissima* but atypical vestiture—densely glandular with reduced non-glandular vestiture", and I believe such plants are actually relatively frequent in New Mexico.
- 5 Plants not as above: either the eglandular pubescence of the stems more monomorphic (a secondary trichome type much sparser, if present), eglandular pubescence of the leaves not loosely strigose, distal cauline leaves prominently ciliate, or heads immediately subtended by leafy bracts; usually several of these features
- 6 Stems and leaves strigillose (although leaf margins usually ciliate and stems sometimes with sparse spreading trichomes as well); plants of west-central New Mexico, primarily in grasslands and savannas *Heterotheca nitidula*
 Though usually included with the prominently bracted plants of *Heterotheca fulcrata* s.l., the bracts do not seem to be a consistent feature of this species, at least in plants I have seen in New Mexico. There may be a single leafy bract immediately subtending the head & exceeding the phyllaries, or the cauline leaves may simply diminish in size up the stem, the uppermost relatively small & narrow, a few mm to a cm below the head. When present, the subtending bracts are usually prominently ciliate. The strigillose pubescence of the leaf surfaces is usually sparse enough to place these plants in my first lead of couplet 1. Sometimes the eglandular pubescence is a little denser and the glandular pubescence sparser, so *Heterotheca nitidula* is found under the second lead as well.
- 6 Eglandular pubescence mostly spreading, sometimes very sparse; plants of various habitats, mostly not in west-central New Mexico
- 7 Bracts subtending the heads elliptic to ovate, much longer than the phyllaries, inconspicuously ciliate (with the exception of a few long cilia sometimes found at the bases of the bracts, marginal cilia short and inconspicuous or absent); plants of the Sacramento Mountains / Sierra Blanca area, and Salinas Peak *Heterotheca cryptocephala*
 As the name suggests, the heads are usually much obscured by the bracts. Plants may intergrade with *Heterotheca fulcrata* to the south.

- 7 Bracts subtending the heads usually present but occasionally absent, linear-lanceolate, narrowly oblanceolate, or broadly lanceolate, a little shorter to a little longer than the phyllaries, prominently ciliate or not; plants elsewhere in New Mexico
- 8 Mid-cauline leaves mostly broadly lanceolate to narrowly ovate, base rounded, sessile or abruptly narrowing to a short and inconspicuous petiole; plants of southwestern New Mexico *Heterotheca arizonica*
This species is uncommon in the state. Nesom cites 6 collections, SEINet produces one more. With the exception of one from near the Plains of San Agustin, these are in the Florida Mountains and westward.
- 8 Mid-cauline leaves narrowly oblanceolate to spatulate, base attenuate, gradually tapering to the petiole; plants of the north half of the state, south to the Ladrón Mountains *Heterotheca paniculata*
This species usually has leafy bracts immediately subtending some of the heads, but this feature is unreliable. In general appearance and habitat it is most likely to be confused with *Heterotheca hirsutissima*, but the eglandular pubescence of the leaf surfaces is strigose in that species, hispid-hirsute to short-hirsute in this one. The cauline leaves are often narrow, conduplicate, gently recurved, and more or less contorted.
- 2 Plants prominently eglandular-pubescent on the stems and leaves; glands usually present as well, but more or less obscured or inconspicuous
- 9 Leaves or bracts subtending the heads with revolute margins; trichomes pustulose-based; plants of the eastern plains
- 10 Leaves with revolute margins; leaves loosely strigose, the trichomes long, straight and appressed for most of their lengths (exclusive of marginal cilia) *Heterotheca angustifolia*
- 10 Only the bracts with revolute margins; leaves hispid-strigose, the hairs short and incurved, sometimes intermixed with spreading hairs on the surfaces of the leaves in addition to marginal cilia *Heterotheca scabrifolia*
These plants have been called *Heterotheca stenophylla* in New Mexico, but Nesom uses that name in a narrower sense for plants of Texas. Nesom cites only two questionable records from New Mexico, indicating he has not seen either, so it may or may not truly be present in the state.
- 9 Neither leaves nor bracts with revolute margins; eglandular trichomes pustulose-based or not; plants throughout the state, including the eastern plains
- 11 Heads not subtended by leafy bracts as long as or longer than the phyllaries
- 12 Plants with erect stems, tall (usually > 40 cm); mostly in the southern third of the state and on the eastern plains; plants usually sericeous, often silvery
- 13 Plants rhizomatous, colonial; plants with many, prominent axillary tufts of small, silvery-canescens leaves; east-central and northeastern plains *Heterotheca canescens*
Although the pubescence is mostly appressed and sericeous, usually the leaves are prominently ciliate towards the bases and the stems have long, stiff, sparse trichomes near the bases on the leaves, often giving the impression of a sparse but bright fuzzy halo around the plant.
- 13 Plants not rhizomatous, caespitose; axillary tufts often present but few, not conspicuously silvery; mostly in the southern third of the state and near Santa Fe, not on the east-central / northeastern plains
- 14 Pubescence of the leaves dense, fine, closely strigose; surfaces eglandular or with inconspicuous sessile glands mostly obscured; involucre (5-)6-9 mm wide when pressed, rays (10-)12-20 *Heterotheca zionensis*
Plants can reach 150-200 cm in good conditions. This species is found mostly near roadsides and other disturbed habitats, especially around Las Cruces and Santa Fe, and most populations in the state may be introduced. The leaves are often widely spreading in the basal half and somewhat abruptly bent to become nearly erect in the distal half. Plants are sericeous and usually ± silvery, a feature that may help in uncertain cases.
- 14 Pubescence of the leaves sparser, strigose-hirsute, the trichomes thicker and coarser; surfaces conspicuously sessile-glandular; involucre 7-9 mm wide when pressed, rays 18-25 *Heterotheca loboensis*
This species is likely to be confused with *Heterotheca zionensis*. It is apparently rare in New Mexico; Nesom cites a single specimen in southwestern Chaves County.
- 12 Plants shorter (usually < 40 cm), usually ± hemispherical and at least the outer stems ± sprawling or decumbent; throughout the northern two thirds of the state
- 15 Stems and leaves strigose, eglandular, sometimes with sparse, longer, spreading trichomes as well *Heterotheca pedunculata*

This species is found in the northern third of the state from montane woodlands to subalpine and alpine habitats. At higher elevations it can become sprawling and subrhizomatous, forming depressed mounds.

15 Stems hirsutulous or with 2-storied pubescence, both hirsute and strigose; leaves both strigose and glandular

16 Plants throughout the northern two thirds of the state; plants caespitose, usually many-stemmed, ± hemispherical; stems eglandular; rays 7-11 mm long ... *Heterotheca hirsutissima*
This is probably the most widely distributed and abundant member of the genus in the state. Nesom discusses a number of unusual forms that may be encountered. Plants can, occasionally, have narrow bracts subtending some of the heads. The cauline leaves are often bent or contorted.

16 Plants of the Sierra Blanca / Sacramento Mountains / Guadalupe Mountains region; plants with 1 to a few ± erect stems; stems at least sparsely glandular; rays 10-14 mm long

..... *Heterotheca sierrablancensis*
This species is similar to *Heterotheca hirsutissima*. Although it appears to be a recognizably distinct entity, there don't appear to be good morphological characters that are likely to yield a high success rate without considering geography as well. Some plants are intermediate between this and *Heterotheca cryptocephala*.

11 Heads subtended by leafy bracts equalling or exceeding the phyllaries

17 Bracts and distal cauline leaves oblanceolate, bases long-attenuate; plants alpine or subalpine

..... *Heterotheca pumila*

Apparently rare in New Mexico. Nesom cites a single specimen from the Culebra Range, Taos County.

17 Bracts and distal cauline leaves ± elliptic, bases rounded to cuneate; plants often montane but neither alpine nor subalpine

18 Stems and leaves strigillose, excepting occasional spreading trichomes on the stems and a few marginal cilia toward the bases of the leaves; bracts 0 or 1; plants of west-central New Mexico

..... *Heterotheca nitidula*

Although I do not like to rely on capitular bracts for this species at couplet 10, neither do I wish for it to appear in triplicate. *Heterotheca nitidula* is easily recognizable once its acquaintance has been made, so I hope the reader comes to know it first by plants that key more easily.

18 Stems and leaves usually hirsutulous to hirsute-villous, or occasionally loosely strigose; bracts 1-3; plants of south-central New Mexico and along the southern edge of the state

..... *Heterotheca fulcrata*

Plants intermediate with *Heterotheca cryptocephala* in the Sacramento Mountains are likely to cause occasional confusion.