The Status of the Genus *Chamaesyce* in New Mexico

Eugene Jercinovic
6285 Algodón Rd. SW
Deming, NM 88030

The genus *Chamaesyce* contains between 250 and 300 species worldwide. The United States has roughly 90 species. The Southwest has the greatest species diversity. Texas leads the nation with over 40 species, followed by Arizona with about 30, and New Mexico with 27. Plants in the genus utilize the $\mathbf{C_4}$ photosynthetic pathway with the leaves displaying Kranz anatomy (Steinmann & Felger, 1997). The group is best collected in late summer. Seeds are extremely important in classification. In New Mexico the group has not been thoroughly collected and is often overlooked in the quest for more interesting and spectacular plants. This paper is an effort to elucidate the group in the state, to develop a state specific key, and to illustrate the range of each species.

In 1941, Louis Cutter Wheeler produced his classic monograph of *Euphorbia* subgenus *Chamaesyce*. However, controversy has swirled around this treatment. Since Wheeler considered *Chamaesyce* as a subgenus rather than a genus, the following discussion will employ his designations. Wheeler's characterization of *E. maculata* has been the subject of much confusion. As detailed by Burch (1966), Wheeler, in his analysis of Linnaean specimens, selected the wrong plant as the type of *E. maculata*. The correct type for *E. maculata* is that described by Wheeler as *E. supina*. Wheeler's description of *E. maculata* corresponds to *E. nutans.* Burch also indicates: "… there seems little room for argument against maintaining *E. chamaesyce* L. as the name for a Mediterranean plant not so far found in the New World, and *E. prostrata* Ait. as the name for a weed of the Old and New World tropics."

The case of *E. vermiculata* is also of interest. Wheeler states: "In Arizona and New Mexico it [*E. vermiculata*] may be native and represent the fringes of a puzzling Mexican complex centering around *E. maculata* [*E. nutans*]. Most of the Arizonan and New Mexican plants approach or even intergrade with *E. maculata* [*E. nutans*]. To identify plants of Arizona and New Mexico with those of New England when they are not found between may seem fantastic but even worse is the fact that some Argentinian specimens seem identical." Wheeler depicts the western boundary of the species along the shore of Lake Michigan with the exception of the anomalous specimens in Arizona and New Mexico. Victor Steinmann (1997, p.45) also indicates that the presence of *E. vermiculata* in New Mexico and Arizona is unlikely and that these specimens might be better treated as part of *E. nutans*. Few specimens of either species appear in local herbaria making careful assessment difficult. Existing specimens appear separable on the basis of seed details, so pending a clearer picture of the relationship of these two species, both are included here.

It has been suggested (Patrick Alexander, New Mexico State University, personal communication) that the separation of *E. nutans* and *E. hyssopifolia* may not be simple. The range of *E. nutans* has classically been considered to be from Texas eastward and northward, while that of *E. hyssopifolia* has been southern Florida, the southwestern U.S. and Mexico (see range maps below). However, the two species can intergrade with respect to the usual features used to differentiate them, namely, overall pubescence and the presence or absence of distinct transverse ridges on the seeds. Recent studies of material from Mexico (Johnston, 1975; Steinmann & Felger, 1997) show that both are present in both Chihuahua and Sonora. Careful study of both taxa in the U.S. and particularly Mexico will most certainly be required to determine their relationship. The two treatments above of Mexican Euphorbiaceae both use traditional criteria to distinguish *E. nutans* and *E. hyssopifolia*. This is observed here as well. The presence of *E. nutans* in New Mexico hinges on two specimens, one from Hidalgo County and one from Eddy County.

E. villifera has long been considered a part of New Mexico's flora. Wheeler's treatment does not show any specimens from New Mexico. In fact, Wheeler shows that in the United States the species is present only in the state of Texas. Correll and Johnston (1996) also indicate that the species does not exist in the United States outside of Texas. No New Mexico specimens of this species appear in herbaria in the state, nor at UTEP, nor in the Institute of Natural Resource Analysis and Management (INRAM) database. As a result, *E. villifera* is not treated here.

Below is a list of taxa treated, utilizing the taxonomy of A Working Index of New Mexico Vascular Plant Names (Allred, 2006), followed by a state specific key. A description of each species is provided, with an illustration, a nationwide range map, and a New Mexico range map by county. The key is based on the work of Wheeler and augmented from other sources and herbarium observations. Descriptions were prepared by this author from multiple sources and observations. With the exception of *Chamaesyce carunculata,* line drawings and national range maps of all species are taken from Wheeler's presentation with permission from the editors of Rhodora. The *Ch. carunculata* map and drawing were prepared by this author. Due to resizing of the line drawings required for proper formatting, the size ratios on the originals were no longer accurate and were removed. All line drawings were prepared by Gordon W. Dillon except for *Ch. fendleri* (Frances M. Fay), *Ch. carunculata* and *Euphorbia rayturneri* (Eugene Jercinovic). Ranges of variation of individual species may result in some inconsistencies between descriptions and line drawings. New Mexico range maps were prepared from examination of specimens at UNM, NMC, NMCR, SJNM, SNM, and UTEP and by consulting the INRAM database, and represent current documented distributions. Site data of specimens were often incomplete limiting precise locations of collections. Hence, New Mexico ranges are by county. In the case of *Ch. fendleri*, distributions of both varieties are illustrated on the same range map, with var. *fendleri* shown in gray and var. *chaetocalyx* shown with the letter **C**. Intergrades occur and are not represented. In 2012, as a result of extensive molecular analysis, it appears that the genus *Chamaesyce* will ultimately be returned to sub-generic status in the genus *Euphorbia.* Consequently, a recently discovered new species in this group is included here under the genus *Euphorbia*.

Included Taxa

Chamaesyce abramsiana (L.C. Wheeler) Koutnik
Chamaesyce acuta (Engelmann) Millspaugh
Chamaesyce albomarginata (Torrey & Gray) Small
Chamaesyce arizonica (Engelmann) Arthur
Chamaesyce capitellata (Engelmann) Millspaugh
Chamaesyce carunculata (Waterfall) Shinners
Chamaesyce dioica (Kunth) Millspaugh
Chamaesyce fendleri Torrey & Gray var. ***chaetocalyx*** (Boissier) Shinners
Chamaesyce fendleri (Torrey & Gray) Small var. ***fendleri***
Chamaesyce geyeri (Engelmann) Small
Chamaesyce glyptosperma (Engelmann) Small
Chamaesyce hirta (Linnaeus) Millspaugh
Chamaesyce hyssopifolia (Linnaeus) Small
Chamaesyce lata (Engelmann) Small
Chamaesyce maculata (Linnaeus) Small
Chamaesyce micromera (Bossier ex Engelmann) Wooton & Standley
Chamaesyce missurica (Rafinesque) Shinners
Chamaesyce nutans (Lagasca) Small
Chamaesyce parryi (Engelmann) Rydberg
Chamaesyce prostrata (Aiton) Small
Chamaesyce revoluta (Engelmann) Small
Chamaesyce serpens (Humboldt, Bonpland, & Kunth) Small
Chamaesyce serpyllifolia (Persoon) Small
Chamaesyce serrula (Engelmann) Wooton & Standley
Chamaesyce setiloba (Engelmann ex Torrey) Millspaugh ex Parish
Chamaesyce stictospora (Engelmann) Small
Chamaesyce theriaca (L.C. Wheeler) Shinners var. ***spurca*** (M.C. Johnston) Mayfield
Chamaesyce vermiculata (Rafinesque) House
Euphorbia rayturneri Steinmann & Jercinovic

A Key for Chamaesyce in New Mexico

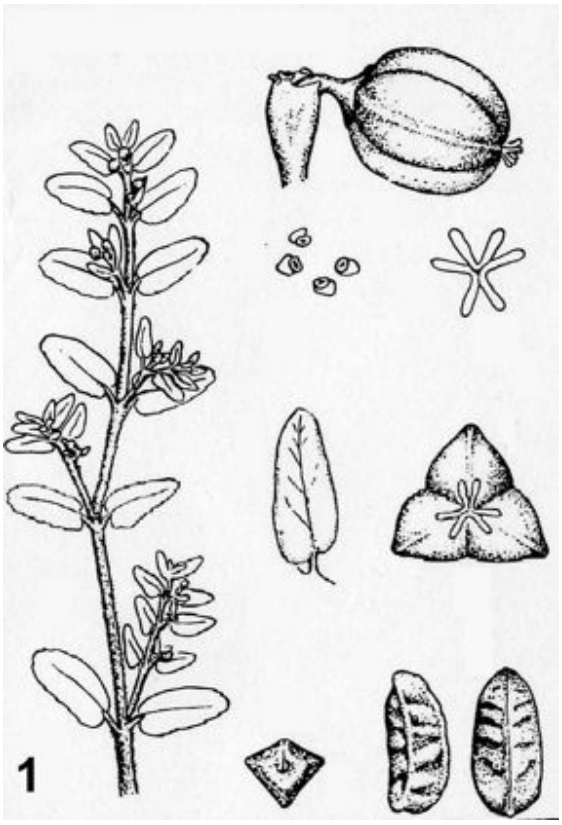
(Adapted from L. C. Wheeler)

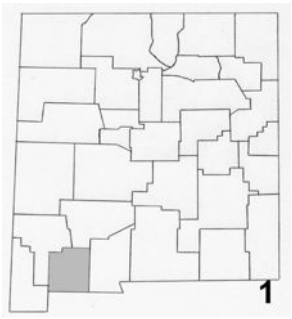
1 Ovary and capsule glabrous
- 2 Stipules united into a white, glabrous membranous scale
  - 3 Annual; staminate flowers 5-10; seeds *ca.* 1 mm long . . . . . ***Ch. serpens***
  - 3 Perennial; staminate flowers 12 or more; seeds 1.2-1.7 mm long . . . . . ***Ch. albomarginata***
- 2 Stipules not as above
  - 4 Delicate, thin-stemmed, erect annual with linear leaves nearly symmetric at the base and capsules 1.3-1.4 mm long; seed faces with a few transverse, rounded ridges . . . . . ***Ch. revoluta***
  - 4 Perennials or annuals not as above
    - 5 Capsules 5-6 mm long; plants annual, leaves entire, internodes 2-12 cm usually much exceeding subtending leaves . . . . . ***Ch. carunculata***
    - 5 Capsules less than 3 mm long
      - 6 Annual; glands without appendages or with a slight rudiment; leaves always entire, never linear, never more than 10 mm long . . . . . ***Ch. micromera***
      - 6 Glands with appendages; leaves sometimes serrate, sometimes more than 10 mm long
        - 7 Robust, erect annuals with larger leaves mostly over 15 mm long, margins serrate, capsules 1.6-2.3 mm long
          - 8 Stems usually crisply hairy, at least on the young tips, rarely pilose; seeds finely wrinkled . . . . . ***Ch. nutans***
          - 8 Stems mostly glabrous, sometimes pilose; seeds with broad, very shallow depressions separated by low smooth ridges . . . . . ***Ch. hyssopifolia***
        - 7 Small prostrate to erect annuals or perennials with largest leaves less than 15 mm long
          - 9 Perennial. Cyathia in leafless terminal cymes, a few in addition sometimes in the upper bifurcations; stems not pilose . . . . . ***Ch. capitellata***
          - 9 Cyathia solitary, or if in leafy cymes, stems pilose
            - 10 Seeds with definite transverse ridges; plants annual
              - 11 Stipules 0.7-1.0 mm long, ventral mostly united into a scale, dorsal mostly distinct, subulate, entire; leaf margins entire . . . . . ***Ch. theriaca***
              - 11 Stipules distinct, 2- to several-parted or dissected; leaf margins usually serrulate at least at the apex
                - 12 Stipules less than 0.5 mm long; involucral lobes divided into 2-4 slender segments, proximal greatly exceeding glands; herbage (at least stems) often pubescent . . . . . ***Ch. abramsiana***
                - 12 Stipules 0.4-1.4 mm long; involucral lobes triangular, shortly attenuate, slightly exceeding glands; herbage glabrous . . . . . ***Ch. glyptosperma***
            - 10 Seeds smooth to rugulose, but never with regular transverse ridges
              - 13 Herbage variously hairy; plants annual
                - 14 Stems prostrate, pilose; capsules triangular in cross -section, 2.1-2.6 mm long; seeds smooth, chalky white . . . . . ***Ch. serrula***
                - 14 Stems prostrate to suberect, sparsely pilose; capsules1.6-1.9 mm long; seeds smooth to slightly wrinkled, dark grayish brown to pale gray. . . . . ***Ch. vermiculata***
              - 13 Herbage glabrous, except stipules sometimes with cilia
                - 15 Seeds smooth, plump; leaves always entire; plants annual, mostly drying yellowish green
                  - 16 Leaves linear to linear-oblong, more than 6 times as long as broad
                    - 17 Petaloid appendages narrow and more or less ascending , ... ***Ch. parryi***
                    - 17 Petaloid appendages mostly longer than glands are wide, ovate, more or less spreading . . . . . ***Ch. missurica***
                  - 16 Leaves not linear, oblong to ovate-oblong or elliptic-oblong, 4-10 mm long, about twice as long as wide; plants prostrate . . . . . ***Ch. geyeri***

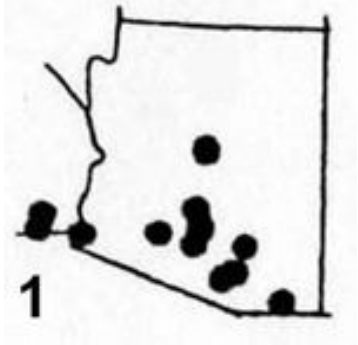
15 Seeds often wrinkled, if smooth, mostly slender; leaves sometimes serrulate; plants mostly drying brownish to green
18 Perennial; capsules more than 2 mm long; leaves entire . . . . . ***Ch. fendleri***
18 Annual; capsules less than 2 mm long; leaves mostly serrulate; seed faces smooth to slightly punctate or rugulose . . . . . .***Ch. serpyllifolia***

1 Ovary and capsule hairy
19 Perennials; staminate flowers 16-60; involucres never urceolate
20 Cyathia borne in dense cymose glomerules, or a few in addition sometimes solitary in the upper bifurcations; leaves often serrate . . . . . ***Ch. capitellata***
20 Cyathia solitary at the nodes and at the tips of the branches; leaves always entire; capsules with short, appressed hairs.
21 Leaves acuminate, median mostly over 1 cm long; capsules *ca.* 3 mm long; seeds 2.2 -2.5 mm long . . . . . ***Ch. acuta***
21 Leaves mostly blunt, never more than subacute, rarely as much as 1 cm long; capsules *ca.* 2.5 mm long; seeds *ca.* 2 mm long . . . . . ***Ch. lata***
19 Annuals (except *Ch. arizonica*); staminate flowers up to 12 (sometimes to 15 in *Ch. dioica*); capsules less than 2 mm in diameter
22 Involucre urceolate
23 Perennial; appendages entire or crenate; hairs mostly clavate, glandular. . . . . ***Ch. arizonica***
23 Annual; appendages deeply parted into a few attenuate segments; hairs tapering . . . . . ***Ch. setiloba***
22 Involucre obconic to campanulate
24 Cyathia borne in dense axillary and terminal leafless glomerules . . . . . .***Ch. hirta***
24 Cyathia solitary or on short leafy lateral branchlets
25 Proximal appendages greatly prolonged, often concealing the capsule . . . . . ***Ch. dioica***
25 Proximal and distal appendages without marked disparity in size
26 Cyathia mostly on congested, short, densely leafy lateral branches, some solitary at nodes; styles entire or emarginate; seeds punctately pitted and mottled . . . . . .***Ch. stictospora***
26 Cyathia mostly solitary at nodes (appearing clustered by shortening of internodes); seeds not punctately pitted nor mottled
27 Glands without appendages or with only a slight rudiment
28 Seeds smooth; leaves entire, not over 8 mm long . . . . . ***Ch. micromera***
28 Seeds with 2 well-defined ridges; leaves serrulate, 5-11 mm long; styles undivided . . . . . ***E. rayturneri***
27 Glands appendiculate
29 Capsules strigose; seeds with low rounded subregular transverse ridges; styles bifid one-third or less of their length . . . . . .***Ch. maculata***
29 Upper stems crisply hairy; capsules with crisped hairs on the backs of the carpels, but more or less deciduous on the sides; seeds with 5-7 low sharp irregular transverse ridges; styles bifid nearly to the base . . . . . ***Ch. prostrata***

1 *Chamaesyce abramsiana* Prostrate annual; stems few to several, 5-30 cm long, 1 mm or less thick, finely pubescent to rarely glabrate; leaves opposite, oblong-lanceolate to oblong or elliptic, 2-12 mm long, sparsely puberlent to glabrate, obtuse to rounded at the apex, inequilateral at base, revolute, larger finely serrulate at the apex and on the lower margin, petioles *ca.* 1 mm long; stipules distinct, *ca.* 0.5 mm long, 2- to several-parted, sparsely ciliate to glabrous; cyathia commonly in groups of 5-10 on congested lateral branchlets, or solitary at the nodes; involucres obconic, 0.6-0.8 mm long, 0.6-0.7 mm wide, glabrous outside, lobes parted into 2-4 slender segments, proximal greatly exceeding glands, distal slightly exceeding glands; glands 4, orbicular to transversely elliptical, 0.1-0.2 mm long; appendages white 0.3-0.5 mm long, entire to 2-lobed; staminate flowers 3-5 per cyathium, styles of pistillate flowers 3, about 0.3 mm long, bifid to the middle; capsules ellipsoid-oblong 1.3-1.7 mm long, 3-angled, glabrous; seeds oblong-ovate to oblong, sharply quadrangular, 1-1.4 mm long, widest at the middle, all facets with 4-6 transverse ridges.







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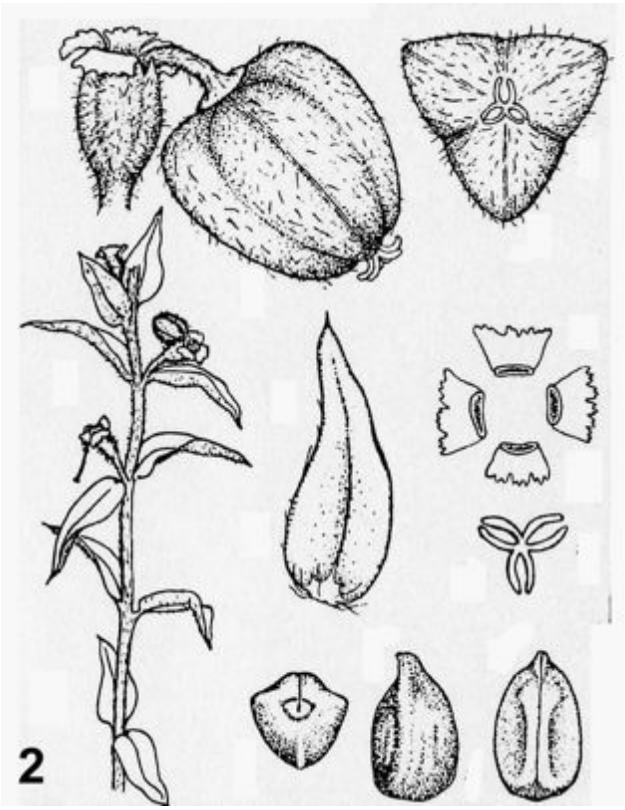
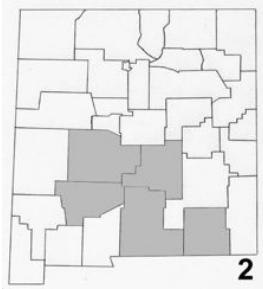
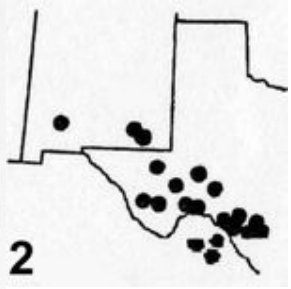
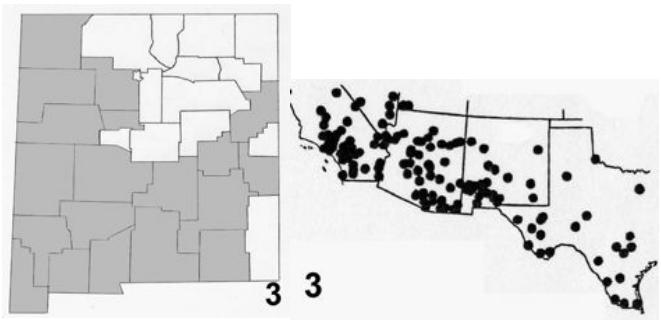
2 *Chamaesyce acuta* Ascending to erect perennial from a starchy taproot; stems several to many from a woody crown, 10-30 cm long, woolly with long weak hairs when young, partly deciduous in age; leaves opposite, ovate-lanceolate to lanceolate, 10-20 mm long, 3-8 mm wide, sparsely villous to densely appressed tomentose below, less pubescent to glabrate above, base subequilateral, rounded to truncate, apex acuminate, margins entire, often revolute, sessile to subsessile; stipules obsolete or absent; cyathia solitary at the nodes; involucres turbinate to urcelolate, 1.8-2.2 mm long, 1.7-2.5 mm wide, sparsely to strongly villous outside; glands 4, oblong-elliptic, slightly concave, ochroleucous; appendages white, as long or longer than glands are wide, margins crenate to erose; staminate flowers 20-25 per cyathium; styles of pistillate flowers 3, *ca.* 1 mm long, bifid about half their length; capsules 3 mm long and broad, sharply 3-lobed,with short, appressed white hairs; seeds ovoid, quadrangular, 2.2-2.5 mm long, 1.5 mm thick, surfaces white, finely reticulate.

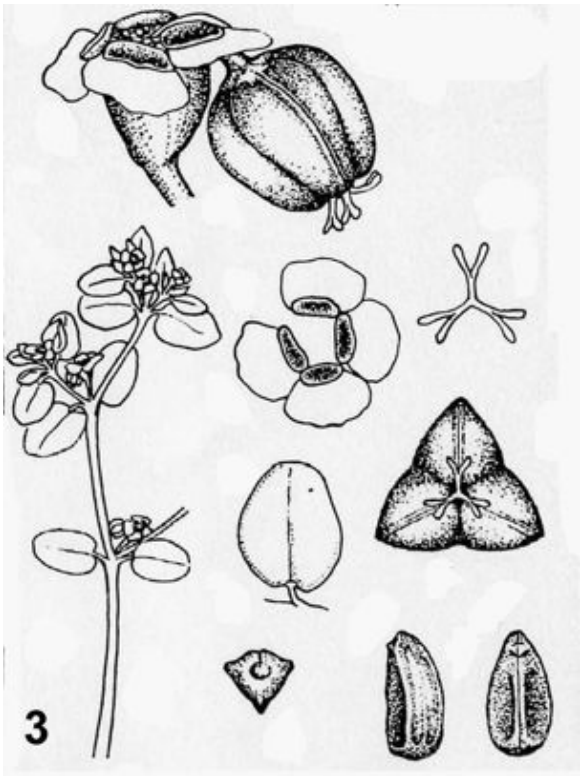






3 ***Chamaesyce albomarginata*** Prostrate perennial from a taproot (becoming woody in age); stems several to numerous, 5-40 cm, glabrous, often rooting at nodes; leaves opposite, orbicular to oblong, 3-8 mm long, sometimes bearing a red spot on middle of adaxial surface, margin entire, petioles 0.5-1.2 mm long; stipules united into a deltoid, membranous, white scale with entire to erose or lacerate margins; cyathia solitary at the nodes; involucres campanulate to obconic or turbinate, 1-1.5 mm long, 1.5-2 mm wide, glabrous; glands 4, transversely oblong 0.5-1 mm long, shallowly cupped, ochroleucous or maroon; appendages conspicuous, white, usually wider and longer than glands, margins entire to crenate; staminate flowers 15-30 per cyathium; styles of pistillate flowers 3, 0.5-0.7 mm long, bifid half or more of length; capsules ovoid, sharply 3-angled, glabrous, 1.7-2.3 mm long; seeds oblong to oblong-ovate, quadrangular, 1.2-1.7 mm long, 0.7-0.9 mm thick, whitish, smooth or finely reticulate in transverse lines.





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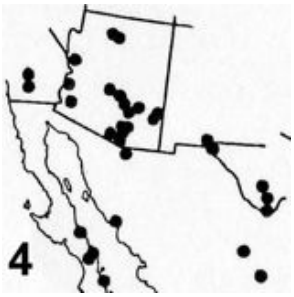
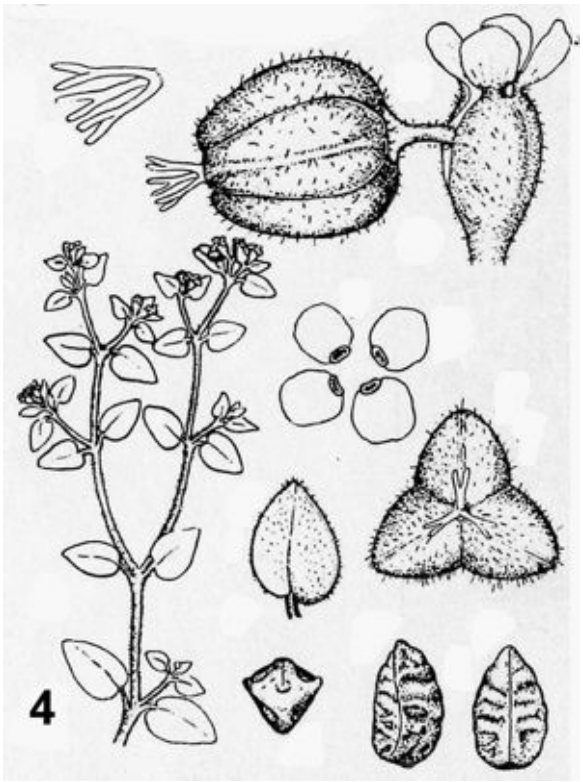
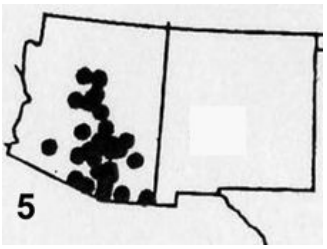
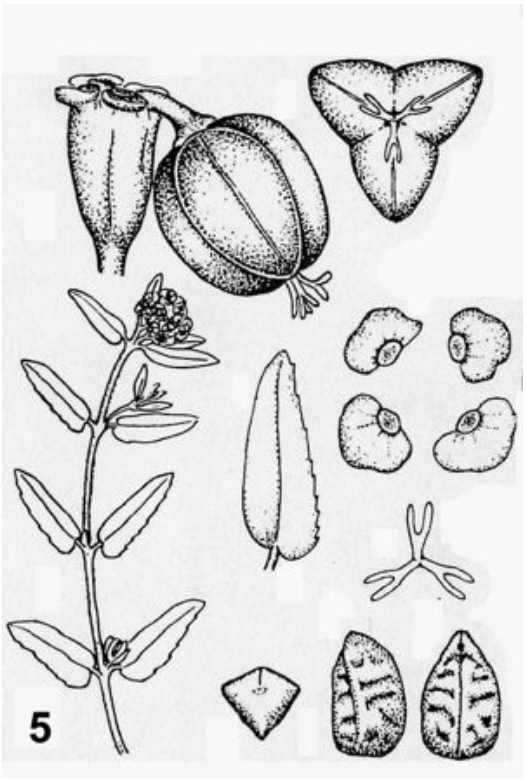
4 ***Chamaesyce arizonica.*** Prostrate to ascending or suberect perennial from a woody taproot; stems several to many, 5-30 cm long, much branched, with fine, spreading, clavate, glandular hairs; leaves opposite, deltoid-ovate to ovate or uppermost ovate-oblong, 1-10 mm long, rounded at the apex, rounded and oblique at the base, margins entire, often slightly revolute, mostly with fine, spreading hairs, at least on lower surface, petioles 1-2 mm long; stipules minute, upper distinct, lower united; cyathia solitary at nodes and in the forks; involucres long turbinate to urceolate, 1.2-1.5 mm long, 0.6-0.8 mm wide, with sparse, short, spreading hairs outside; glands 4, transversely oblong, 0.3-0.4 mm long, red, concave; appendages white to rosy tinged, oval, 0.5-1 mm long, usually entire; staminate flowers 5-10 per cyathium; styles of pistillate flowers 3, *ca.* 0.5 mm long, bifid to the middle; capsules subglobose, obtusely triangular, *ca.* 1.5 mm long, with spreading hairs; seeds oblong or ovoid quadrangular, 1-1.2 mm long, *ca.* 0.6 mm thick, facets with rounded, low, often anastomosing transverse ridges.





5 ***Chamaesyce capitellata*** Ascending to erect perennial; stems few to several, 5-40 cm long, 0.5-1.5 mm thick, puberlent to glabrous; leaves ovate to linear-lanceolate, 4-25 mm long, pubescent to glabrous, base strongly inequilateral, usually sharply and coarsely serrate on lower margin, entire on upper, sometimes alike on both margins; stipules usually distinct, subulate-attenuate, 1.5-2 mm long, ciliate to pubescent, divided into a few linear segments; cyathia rarely solitary, usually in cymose glomerules; involucres campanulate to broadly obconic, 1.3-1.7 mm wide, glabrous to pubescent on the outside; glands orbicular to transversely oval, 0.2-0.45 mm wide, on long stalks; appendages white to pink, entire, glabrous, usually significantly larger than glands; staminate flowers 28-41 per cyathium; styles of pistillate flowers 3, 0.6-0.7 mm long, bifid one-half to two-thirds the length; capsules 1.3-1.9 mm long, glabrous to pubescent, subacutely 3-lobed; seeds quadrangular 1.2-1.4 mm long, 0.6-0.8 mm thick, narrowly ovoid, surfaces with small depressions or faint, transverse wrinkles.





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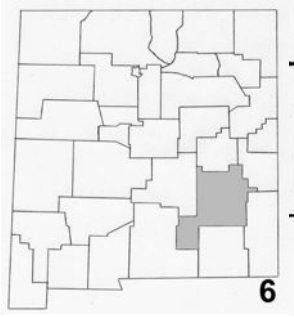
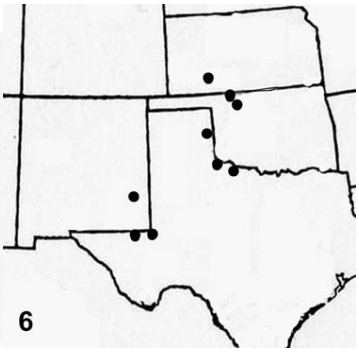
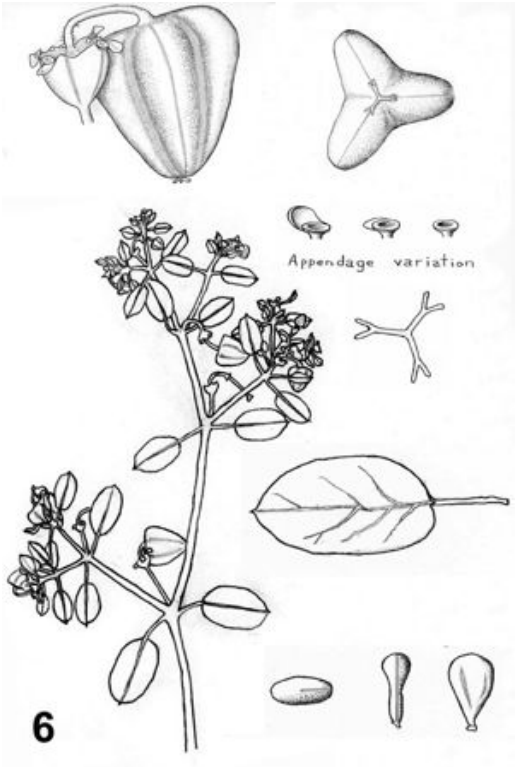
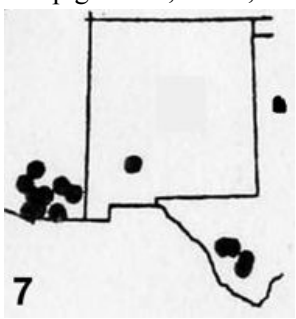
6 ***Chamaesyce carunculata*** Prostrate annual; stems several to many, 10-100 cm or more long, 2-4 mm thick, glabrous, branched, internodes 2-12 cm long, usually much longer than the subtending leaves; leaves ovate to oblong-elliptic, 10-25 mm long, 5-15 mm wide, glabrous, acute and mucronate at the apex, base truncate to sometimes subcordate, slightly inequilateral, margins entire, petioles 2-8 mm long; stipules distinct, lanceolate, 1-2 mm long, usually bifid; cyathia solitary in the forks and at the upper nodes; involucres campanulate, ca. 2 mm long and wide, glabrous outside; glands 4, elliptic to suborbicular 0.3-0.8 mm across, short-stalked, usually cupped; appendages white to yellowish, from narrower that to much wider than glands, margins entire or erose; staminate flowers 16-26 per cyathium; styles of pistillate flowers 3, 0.7-0.8 mm long, bifid ca. one-third of their length; capsules ovoid, 4.5-7 mm long, 4-5 mm wide, deeply 3-lobed, glabrous; seeds laterally compressed, never angulate, 4-5 mm long, 0.7-0.9 mm x 1.5-2 mm near base, narrowing acuminately to apex, grayish-white or mottled reddish-brown. Plants of sand dunes.

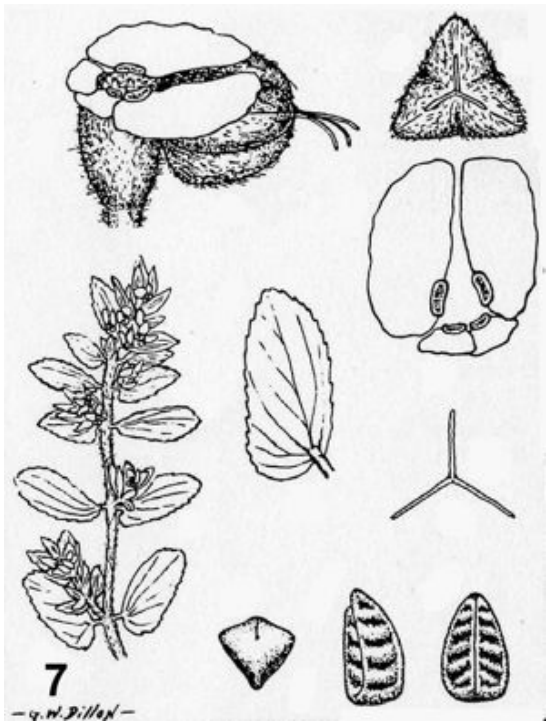






7 *Chamaesyce dioica* Prostrate annual; stems few to several, 5-25 cm long, 0.5-1 mm thick, crisply pilose towards tips, less so at the base, internodes shortened towards tips producing crowded leaves and cyathia; leaves opposite, ovate-deltoid to oblong, 5-8 mm long, 1.5-4 mm wide, apex acute, base strongly inequilateral, serrulate, mostly glabrate above, sparsely crisp-pilose below; stipules distinct, linear-subulate, 1-1.5 mm long, entire, with short crisped hairs; cyathia solitary at distal nodes; involucres cylindrical-campanulate, *ca.* 1 mm long and wide, pubescent outside; glands 4, transversely oval to oblong, 0.2-0.6 mm long, proximal glands about twice as long as distal; appendages white to reddish, wavy margined, distal symmetrical, 0.2-0.3 mm long, proximal asymmetrical, greatly prolonged, 1-1.5 mm long; staminate flowers 5-15 per cyathium; styles of pistillate flowers 3, 0.7-1.3 mm long, entire or slightly bifid; capsules somewhat pear-shaped, 1.4-1.6 mm long, 3-lobed, base truncate, strigose; seeds narrowly ovate to oblong, quadrangular, 0.9-1.2 mm long, 0.4-0.6 mm thick, surfaces with 3-5 transverse ridges separated by deep grooves, white, finely wrinkled.





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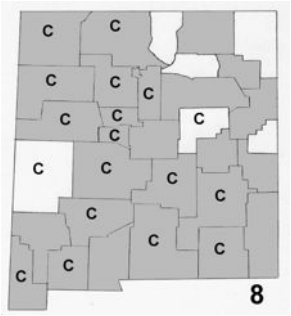
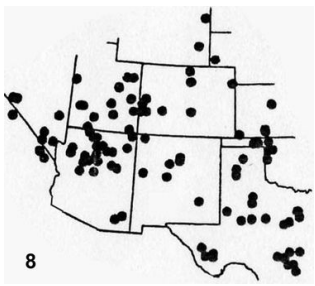
8 *Chamaesyce fendleri* Decumbent to erect perennial from a taproot (becoming woody in age); stems several to numerous, 5-15 cm. long; leaves opposite, ovate-orbicular to ovate-lanceolate, 3-11 mm long, glabrous, margins entire, base inequilateral, petioles *ca.* 1 mm long; stipules distinct, 0.5-1 mm long, linear, mostly entire; cyathia solitary at the nodes; involucres turbinate to campanulate, 1.2-1.8 mm long, glabrous outside; glands 4, transversely elliptical, reddish, 0.5-1 mm long, 1.5-4 times as long as wide; appendages white, about as wide as glands, obtuse and crenate or entire and narrowly deltoid; staminate flowers 25-35 per cyathium; styles of pistillate flowers 3, 0.3-0.7 mm long, bifid at least half their length; capsules ovoid, 3-angled, glabrous, 2.2-2.5 mm long; seeds ovoid-quadrangular, 2-2.2 mm long, 1-1.2 mm thick, front facets smooth, back facets slightly wrinkled, pinkish-brown to whitish.

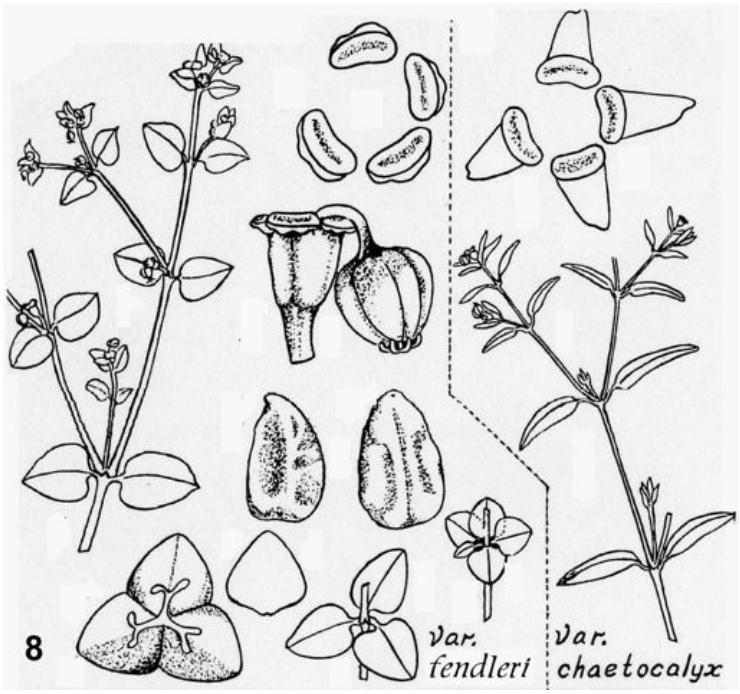
Key to Varieties:

Plants decumbent to erect; leaves ovate-orbicular to ovate-lanceolate; appendages obtuse and crenate.
…….var. ***fendleri***

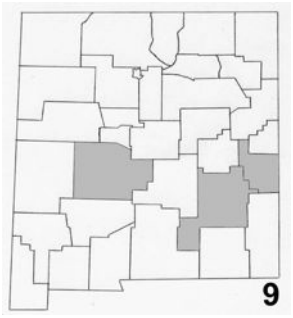
Plants erect and leaves lanceolate; appendages narrowly deltoid and entire. . . . . .var ***chaetocalyx***

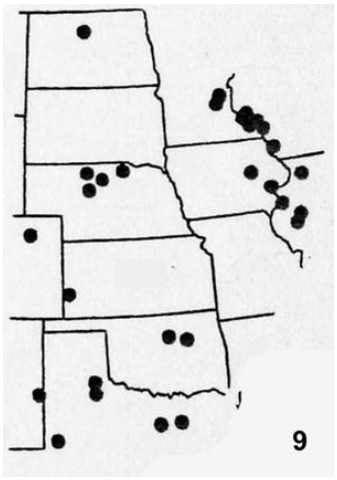


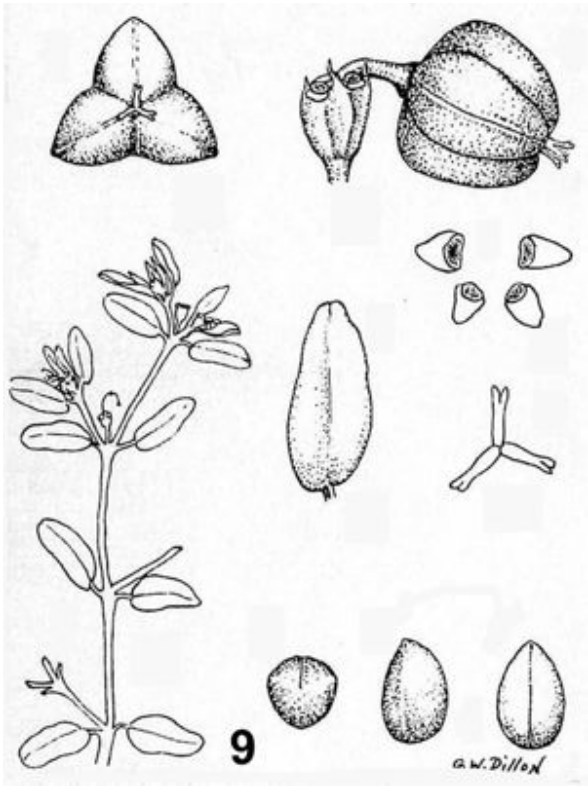




9 *Chamaesyce geyeri* Prostrate annual; stems several, glabrous, 5-40 cm long, 0.4-1.4 mm thick; leaves opposite, glabrous, oblong to ovate-oblong to elliptic-oblong, 4-10 mm long, about twice as long as broad, oblique and obtuse to rounded at the base, apex obtuse or emarginate, often mucronate, petioles 1-2 mm long; stipules distinct or the ventral sometimes united, glabrous, 1.0-1.5 mm long, often divided into three filiform segments; cyathia solitary in upper forks; involucres campanulate to turbinate, 0.9-1.5 mm long, glabrous outside; glands 4, oval to subcircular, 0.2-0.6 mm long; appendages white, half to twice as wide as the gland; staminate flowers 5-17 per cyathium, anthers ochroleucous to whitish; styles in pistillate flowers 3, 0.2-0.6 mm long, ⅓-½ bifid; capsules roundly and deeply 3-lobed, *ca.* 2 mm long and 2.5 mm broad, base truncate; seeds 1.3-1.6 mm long, ovoid to subtriangular, acute at apex, pale brown to nearly white, plump, smooth; plants of sand dunes or sand barrens.







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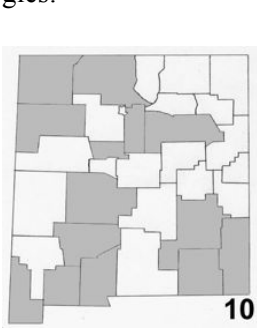
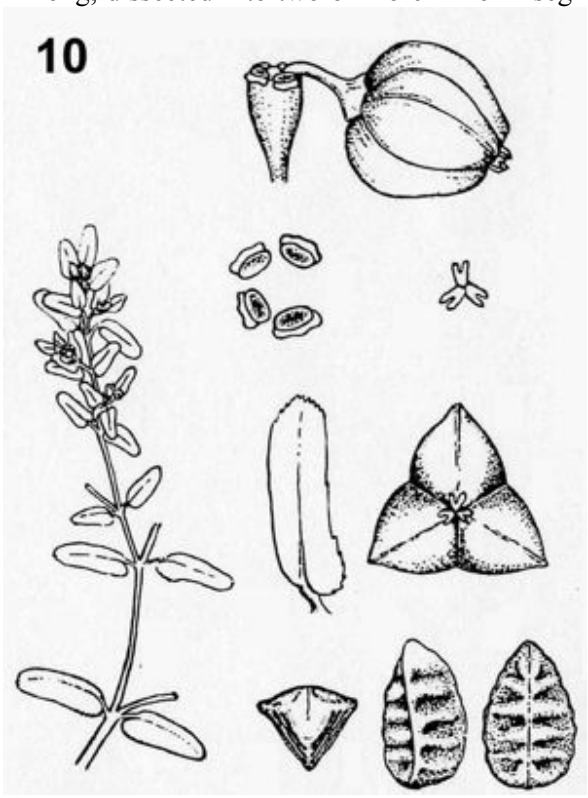
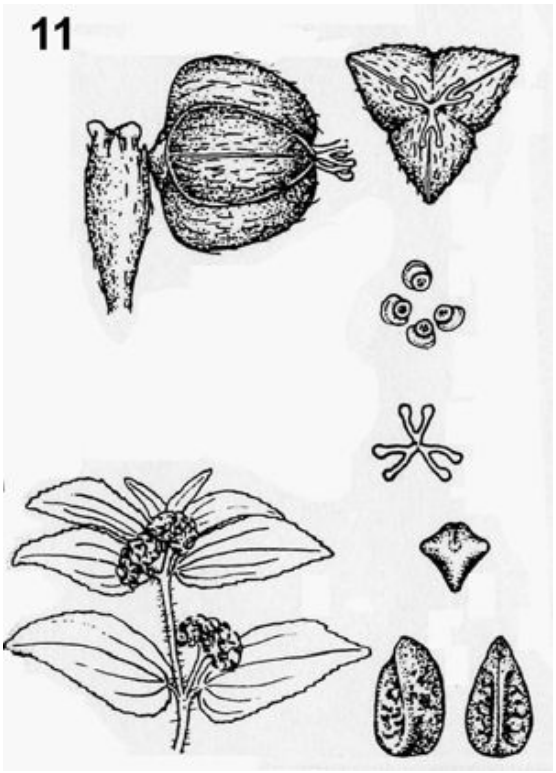
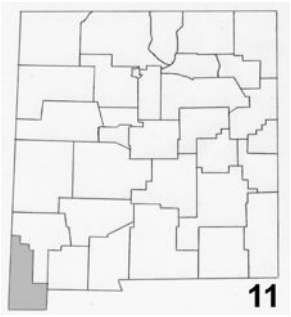
10 *Chamaesyce glyptosperma* Prostrate annual; stems several to numerous, 5-30 cm long, 0.5-1.5 mm thick, glabrous, much branched; leaves opposite, glabrous, oblong to obovate-oblong (sometimes ovate-oblong), 2-10 mm long, 3-4 times as long as wide, base strongly inequilateral and rounded to truncate, margins often serrulate at the rounded apex, petioles 0.3-1 mm long; stipules distinct, 0.4-1.4 mm long, dissected into two or more filiform segments; cyathia solitary at the nodes; involucres obconic to turbinate, 0.5-0.8 mm long, 0.6-0.9 mm wide, glabrous outside, lobes triangular, shortly attenuate, slightly exceeding glands; glands 4, small, oblong, 0.1-0.2 mm wide, cupped; appendages white, from shorter than to about as wide as gland is long, subentire to crenulate; staminate flowers 1-5, mostly 4, per cyathium; styles of pistillate flowers 3, 0.15-0.3 mm long, bifid one-third to one-half their length; capsules ovoid, sharply 3-angled, 1.4-1.7 mm long, wider below the equator, glabrous; seeds ovate, quadrangular, 1-1.3 mm long, widest below the middle, all facets with 3-6 definite transverse ridges which often pass through the angles.

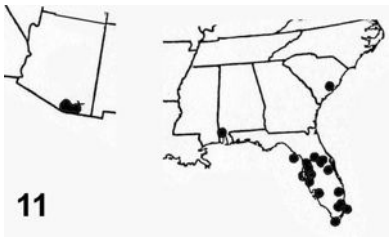




11 ***Chamaesyce hirta*** Mostly erect to decumbent annual from a taproot; stems few 2-60 cm long, 1-1.5 mm thick, strigose and often pilose with long yellow tapering hairs, internodes 1-4 (-7) cm; leaves varying from narrowly lanceolate to ovate, mostly broadly rhombic-lanceolate, 4-40 mm long, sparsely strigose or glabrate above, below with appressed to spreading crisped hairs, base markedly inequilateral, apex acute, margins sharply to bluntly serrate, petioles 1-2 mm long; stipules distinct or slightly united at base, triangular, attenuate, about 1 mm long, usually with linear lobes below and with short scattered hairs; cyathia in dense pedunculate clusters; involucres obconic-campanulate, 0.6-0.9 mm wide, upwardly strigose outside; glands 4, stalked, cup- to disk-shaped, circular to elliptic, 0.15-0.3 mm long; appendages white, from obsolete to twice as wide as glands, glabrous; staminate flowers 2-8 per cyathium; styles of pistillate flowers 3, 0.2-0.4 mm long, bifid one-half to two-thirds of length; capsules sharply 3-angled, 1-1.2 mm long, antrorsely short-strigose, base truncate; seeds sharply quadrangular, 0.7-0.9 mm long, 0.5-0.6 mm thick, with subregular to irregular, low, smooth, wrinkles.







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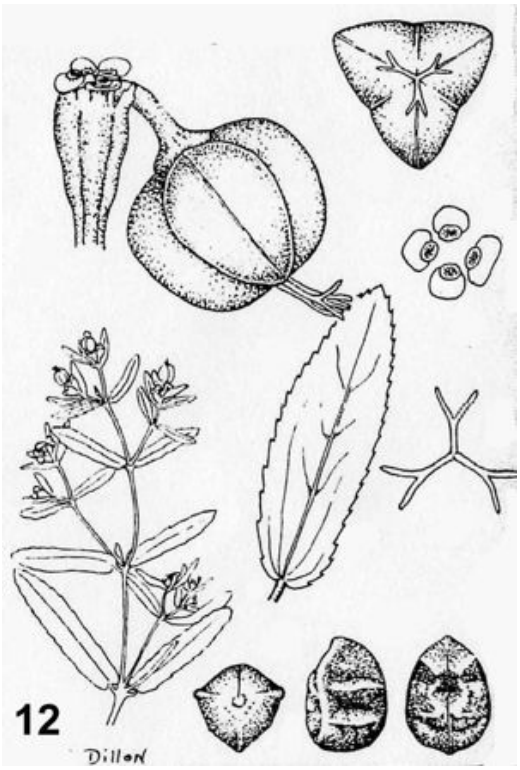
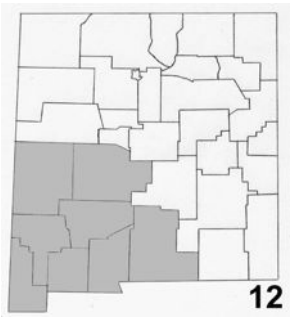
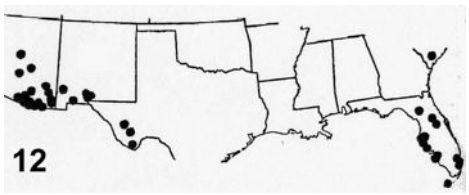
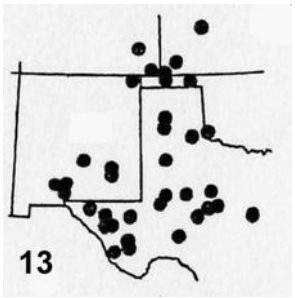
12 ***Chamaesyce hyssopifolia*** Erect annual 10-60 cm tall; stems mostly simple below, with ascending branches above, mostly glabrous, sometimes sparsely pilose; leaves opposite, lanceolate to oblong, often falcate, 5-30 mm long, base rounded to truncate, inequilateral, mostly glabrous, sometimes sparsely pilose at the base, margins serrate, petioles 1-1.5 mm long; stipules mostly united, triangular, as broad as high, *ca.* 1 mm long, margins entire to slightly ciliate or lacerate; cyathia solitary in forks or appearing clustered by shortened internodes; involucres obconic to turbinate, 1.2-1.7 mm long, 0.7-0.9 mm broad, glabrous outside; glands 4, circular to broadly elliptical, 0.15-0.3 mm long, yellowish to maroon; appendages white, reniform from shorter than to twice as long as the glands are wide, entire; staminate flowers 4-15 per cyathium; styles in pistillate flowers 3, 0.5-0.9 mm long, bifid one-half to two-thirds; capsules glabrous, broadly ovoid, 1.6-2.1 mm long, subacutely angled; seeds ovoid-quadrangular, 1-1.4 mm long, 0.7-1.1 mm thick, larger two facets with 2 or 3 shallow depressions separated by rounded ridges, surface brownish to grayish-white.

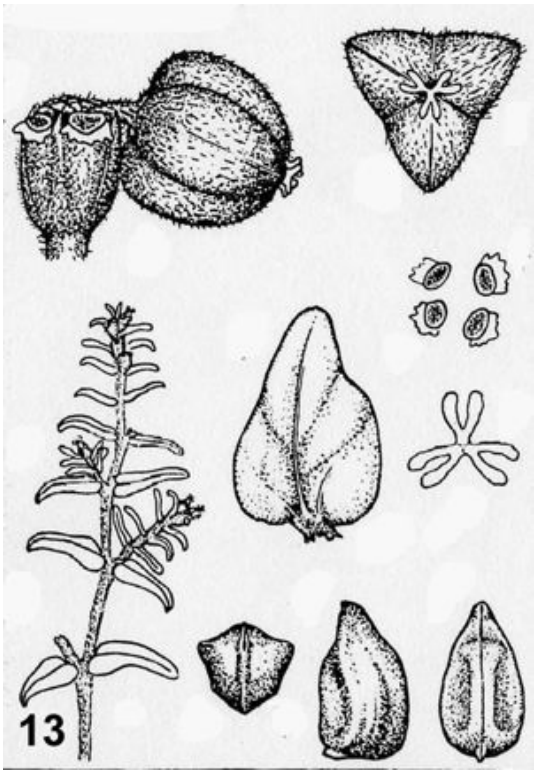






13 *Chamaesyce lata* Ascending to erect perennial 5-15 cm tall from slender, shallow rhizomes; main stems solitary to several, 1-3 cm long, 0.5-1 mm thick, crisply white hairy to glabrate, forking pseudodichotomously above into branches with short, appressed hairs; leaves opposite, ovate to deltoid, falcate, often appearing narrower due to revolution of margins, 4-12 mm long, 2-9 mm wide, minutely crisply hair above, white-strigose below, margins entire, petioles *ca.* 1 mm long, white-strigose; stipules united, subulate, *ca.* 1 mm long, white-strigose; cyathia solitary at the nodes; involucres turbinate to campanulate, 1-1.5 mm long, crisply white-hairy; glands 4 transversely oblong, 0.5-0.8 mm long; appendages ochroleucous, from obsolete to about as wide as gland is long, margins crenate to erose; staminate flowers 25-35 per cyathium; styles of pistillate flowers 3, 0.4-0.8 mm long, bifid to about the middle; capsules sharply 3-lobed, 2-2.5 mm long, white-strigose; seeds oblong, somewhat quadrangular, 1.7-2 mm long, brownish to white, facets smooth.





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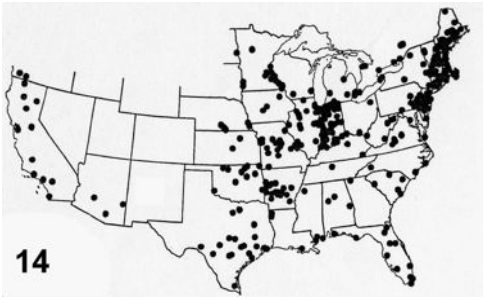
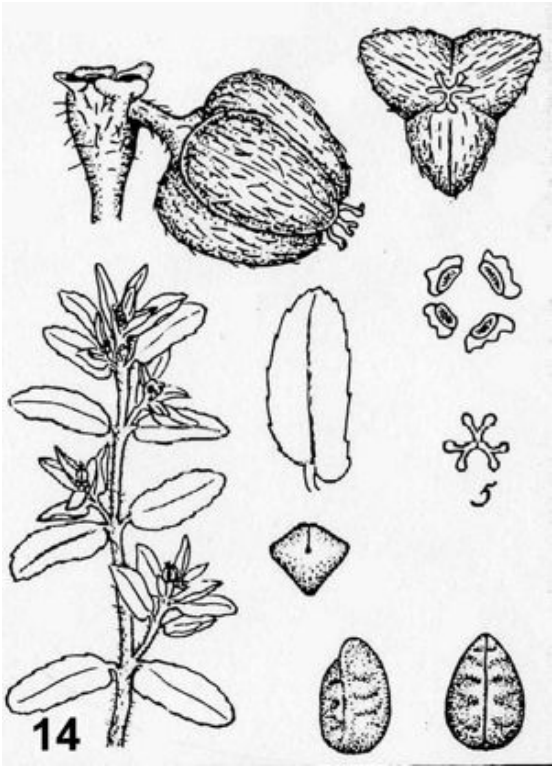
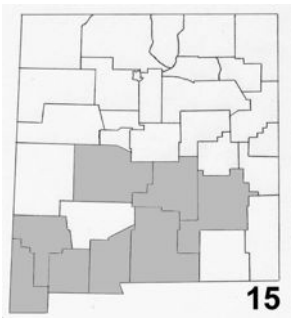
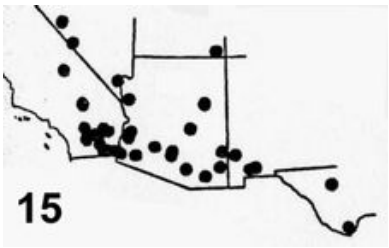
14 *Chamaesyce maculata* Prostrate to decumbent annual; stems several, 10-45 cm long, glabrate to pubescent at the base, increasingly shaggy pubescent towards tips; leaves opposite, elliptic-ovate or oblong-ovate to linear-oblong, 4-17 mm long, truncate and inequilateral at the base, sparsely villous to glabrate, especially above, margins serrulate to entire, larger leaves often with 1 or 2 red spots above, petioles 1-1.5 mm long; stipules 1 mm long or less, linear-subulate to narrowly triangular, sometimes 2 or 3 parted; cyathia solitary at the nodes, but often crowded into condensed, leafy clusters by shortened internodes; involucres turbinate to obconic, 0.5-1 mm long, *ca.* 0.8 mm wide, villous; glands 4, oblong, 0.15-0.25 mm wide, often reddish; appendages white, equaling or slightly surpassing the width of the glands, margins irregularly crenulate; staminate flowers 2-5 per cyathium; styles of pistillate flowers 3, 0.3-0.4 mm long, bifid one-fourth to one-third their length; capsules ovoid-triangular, sharply 3-angled, 1.2-1.5 mm long, strigose; seeds quadrangular-oblong, *ca.* 1 mm long, surfaces with subregular, low, transverse ridges.

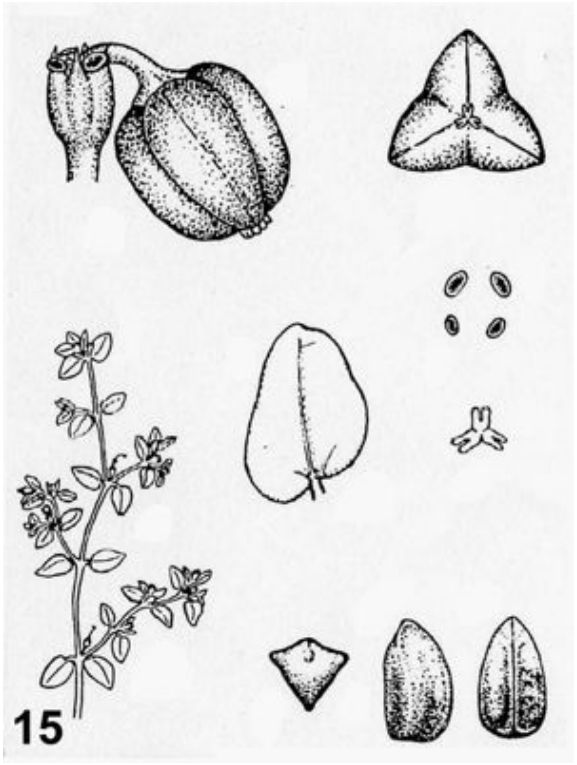




15 ***Chamaesyce micromera*** Prostrate annual; stems glabrous to puberlent, 5-20 cm long, much branched; leaves opposite, 2-7 mm long, ovate to oblong, glabrous to puberlent, base strongly oblique in larger leaves, slightly oblique in smaller leaves, margins entire, petioles *ca.* 0.5 mm long; stipules distinct to partially united, 0.5-0.8 mm long, subulate to triangular, short ciliate, at least at tip; cyathia solitary in the axils; involucres campanulate, slightly constricted above, *ca.* 1 mm long, 0.9 mm wide, glabrous to pubescent outside; glands 4, discoid to transversely oblong, 0.1-0.2 mm long, pink to red; appendages absent or sometimes present as a thin white margin on glands; staminate flowers 2-5 per cyathium; styles of pistillate flowers 3, 0.2-0.3 mm long, notched or bifid; capsules globglobular, 3-angled, 1.2-1.4 mm long, glabrous to pubescent; seeds oblong, quadrangular, 1.1-1.3 mm long, *ca.* 0.5 mm thick, white to brownish, facets smooth to faintly wrinkled.







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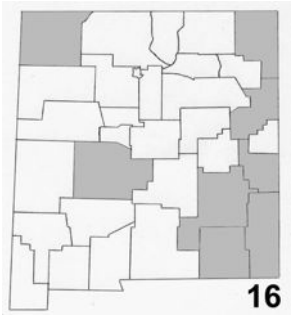
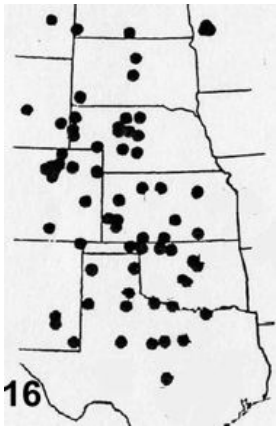
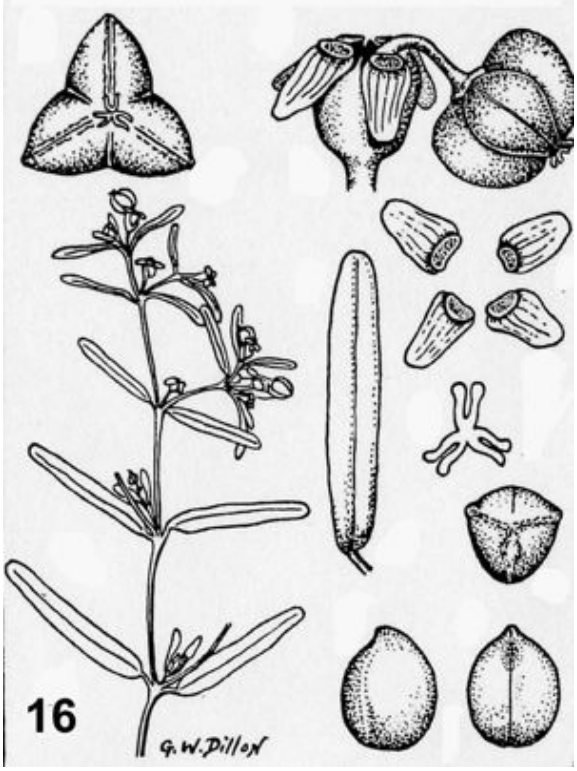
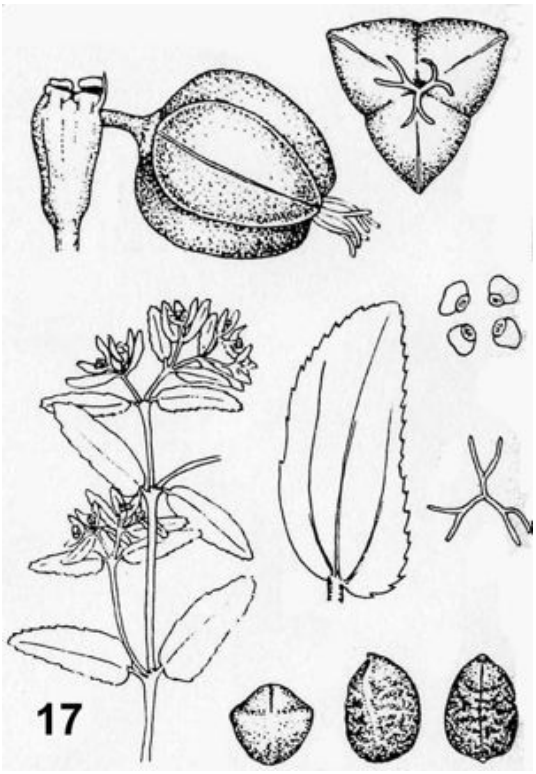
16 ***Chamaesyce missurica*** Ascending to erect annual; stems several 10-80 cm long, glabrous, much branched; leaves opposite, glabrous, linear, 1-3 cm long, 1.5-5 mm wide, glabrous, apex truncate to emarginate, base symmetrical to slightly asymmetrical, margins entire; stipules distinct to somewhat united, triangular-subulate to linear, glabrous, 1-1.5 mm long, entire to parted; cyathia solitary or appearing clustered by shortened internodes; involucres campanulate, 1.2-1.7 mm long, 1.7-1.9 mm broad, glabrous outside; glands 4, elliptic to subcircular, 0.3-0.6 mm long, cupped or folded; appendages white to pink, ovate, entire to slightly emarginate, from somewhat to as much as three times as long as glands are wide; staminate flowers 29-50 per cyathium; styles in pistillate flowers 3, 0.7-1.0 mm long, bifid half their length; capsules 2-2.5 mm long, globose-ovoid to roundly triangular, or more deeply 3-lobed, glabrous; seeds ovoid to broadly ovoid-triangular, 1.5-2 mm long, 1.2-1.4 mm thick, brownish white, angles evident but blunt.







17 ***Chamaesyce nutans*** Erect annual, 10-80 cm tall; stems simple for first few centimeters, pseudodichotomously forking into long, erect or ascending branches, distal internodes often crisply pubescent on a line or on one or two sides; leaves opposite, oblong-lanceolate to oblong or falcate-lanceolate, 8-35 mm long, mostly glabrous above, usually pilose below at least at the base, base rounded or truncate, inequilateral, margins serrate, petioles 1-1.5 mm long; stipules mostly united, sometimes distinct at distal nodes, triangular to subulate up to about 1 mm long, ciliate to lacerate marginally; cyathia solitary or in cymose clusters; involucres obconic to turbinate 0.7-1.0 mm long and wide, glabrous outside; glands 5, stalked, circular to elliptical, 0.1-0.3 mm in diameter; appendages rudimentary to 0.5 mm long, oval, entire or somewhat lobed; staminate flowers 5-11 per cyathium; styles of pistillate flowers 3, 0.6-1.0 mm long, bifid one-third to one-half their length; capsules glabrous, broadly ovoid, 1.9-2.3 mm long, subacutely lobed; seeds ovoid, 1.1-1.6 mm long, 0.9-1.1 mm thick, grayish white, irregularly wrinkled or faintly rippled.



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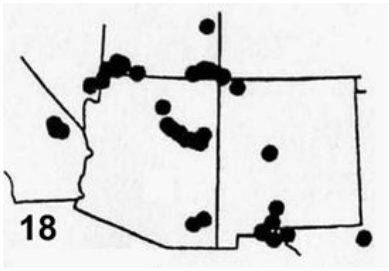
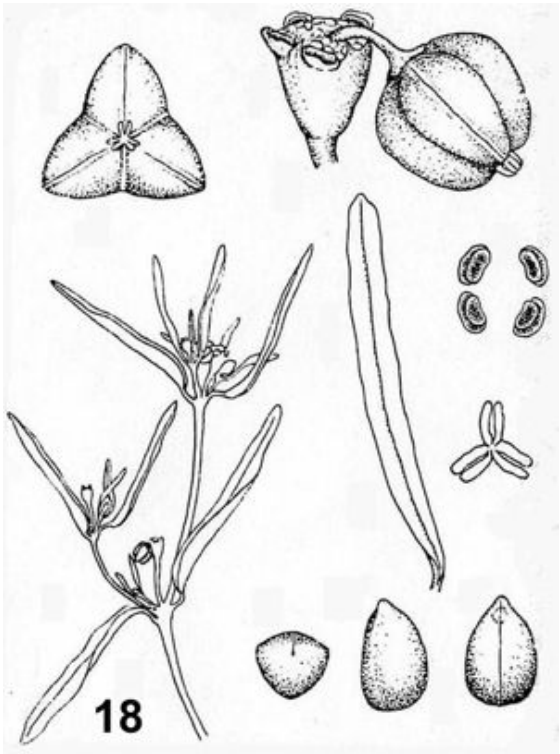
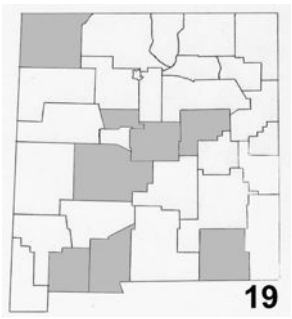
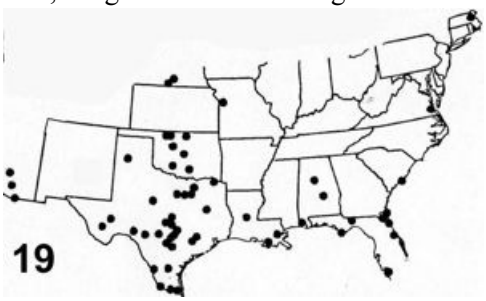
18 ***Chamaesyce parryi*** Erect to prostrate annual; stems several, glabrous 5-70 cm long; leaves opposite, linear, 5-28 mm long, entire, glabrous, base slightly inequilateral, apex rounded, often mucronate, petioles 1-2 mm long; stipules distinct, inconspicuous, up to 1 mm long, subulate to bifid or cleft into slender segments; cyathia solitary and terminal in stem forks; involucres cupulate-campanulate, 1-1.7 mm long; glands 4, 0.3-0.5 mm long, elliptic, cupped; appendages white to ochroleucous, entire, narrow, generally narrower that the gland is wide; staminate flowers 40-55 per cyathium; styles in pistillate flowers 3, 0.7-0.8 mm long, bifid one-third to two-thirds their length; capsules deeply 3-lobed to triangular or globose, *ca.* 2 mm long, glabrous; seeds plumply ovoid, obscurely and roundly triangular, 1.4-1.8 mm long, smooth or inconspicuously roughened, mottled brown and white; plants of sand dunes or very sandy soil.

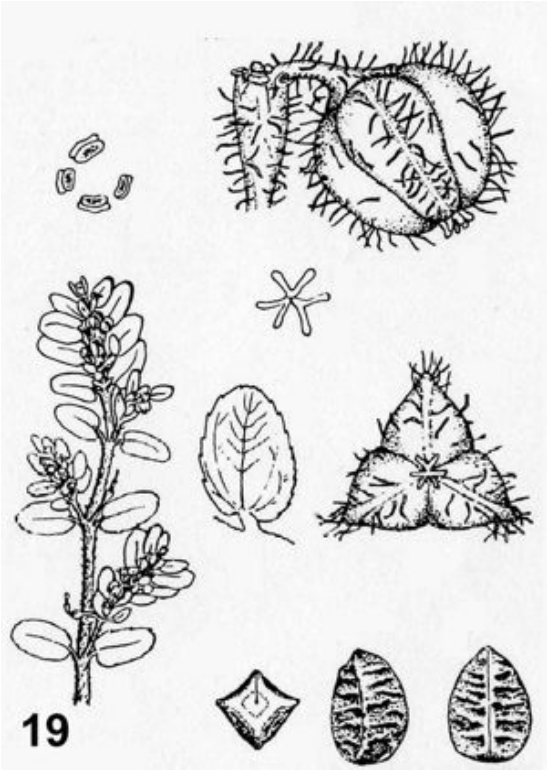




19 *Chamaesyce prostrata* Prostrate to decumbent annual; stems several to many, 5-30 cm long, 1-1.5 mm thick, much branched, crisply short-villous to glabrate; leaves opposite, elliptic or elliptic-oblong to obovate-spatulate or ovate, 3-11 mm long, 4-8 mm wide, short crisply villous below, glabrate above, margins serrulate, especially at the apex, base inequilateral, petioles 0.5-1 mm long; stipules narrowly triangular-subulate, short pubescent, sometimes lacerate, distinct on dorsal side of stems, often united on ventral side; cyathia solitary at distal nodes, mostly on lateral branches with shortened internodes; involucres obconic, 0.8-1 mm long, 0.6-0.9 mm wide, sparsely villous; glands 4, transversely oval or oblong to subcircular, 0.15-0.3 mm wide, cupped, sometimes maroon; appendages mostly as narrow or narrower than glands are wide, white to pinkish, denticulate or erose to subentire; staminate flowers 2-5 per cyathium; styles of pistillate flowers 3, 0.1-0.3 mm long, bifid nearly to the base; capsules ovoid-triangular, 1-1.4 mm long, widest below the equator, with crisped hairs on the angles, more or less deciduous between; seeds oblong to ovate, sharply quadrangular, 0.9-1 mm long, 0.6-0.7 mm thick, facets with low, narrow, irregular transverse ridges.







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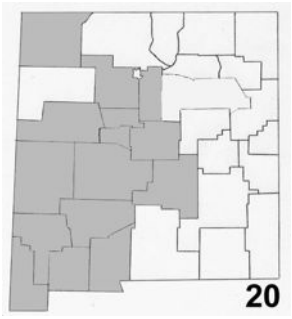
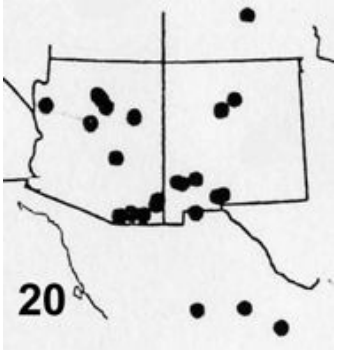
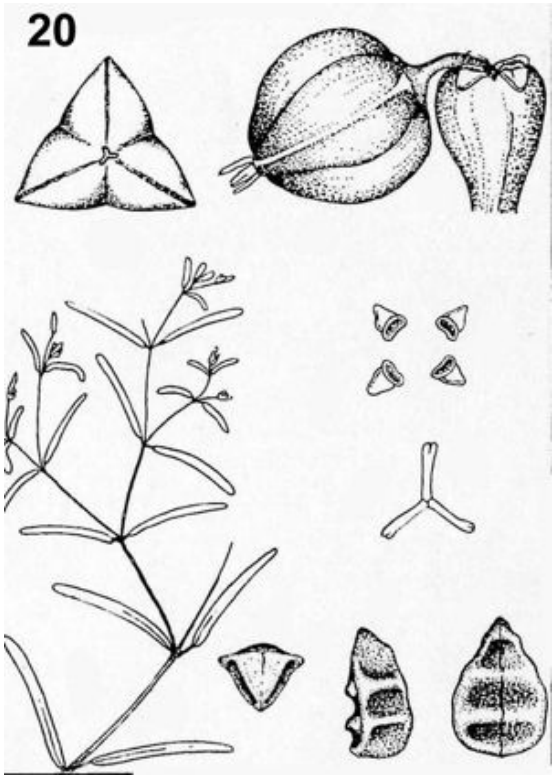
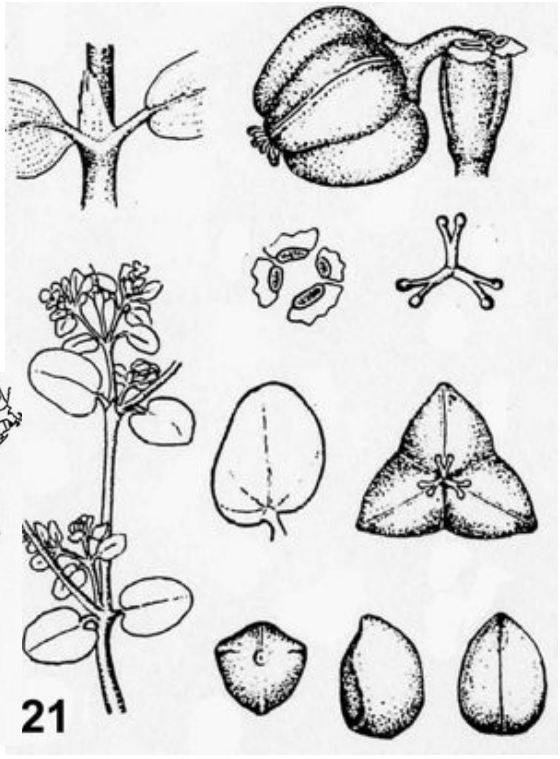
20 *Chamaesyce revoluta* Erect annual 3-20 cm tall; main stem 2-6 cm tall, up to 2 mm in diameter, glabrous, forking repeatedly into glabrous branches, progressively finer, ultimately 0.15-0.25 mm thick; leaves opposite, linear 2.5-25 mm long, 1-1.2 mm wide, petiolate, glabrous, nearly equilateral at base, margins entire, revolute; stipules distinct, glabrous, entire, linear-subulate, 0.3-0.8 mm long; cyathia solitary in branch forks, sometimes appearing clustered due to shortened internodes, peduncles 0.5-1.4 mm long; involucres obconic to campanulate, glabrous, 0.7-0.9 mm long; glands 4, subcircular 0.15-0.3 mm in diameter, lightly cupped; appendages white to purple, ranging from almost obsolete to shortly ovate and somewhat longer than gland is wide, margins entire; staminate flowers 3-10 per cyathium; ovary glabrous, 3-angled; styles 3, 0.3-0.5 mm long, entire or shortly bifid; capsules glabrous, sharply 3-angled, 1.3-1.5 mm long, basally truncate; seeds ovoid, sharply angled, 1-1.3 mm long, 0.7-0.9 mm thick, surfaces traversed by 2-3 transverse ridges, not or scarcely involving the angles, coat white over brownish testa.

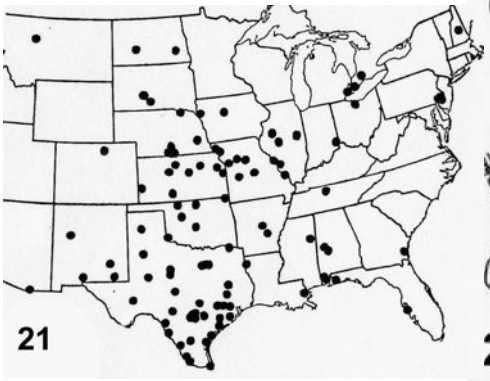






21 ***Chamaesyce serpens*** Prostrate, glabrous annual; stems numerous, up to 50 cm long, 0.1-1.1 mm thick, moderately to densely leafy, sometimes rooting at nodes; leaves opposite, ovate-orbicular to oblong, 2-8 mm long, bases mostly inequilateral, margins entire, petioles mostly less than 1 mm long; stipules united into a glabrous, white membrane 0.5-1 mm long, margin entire to erose or lacerate; cyathia solitary at the nodes; involucres turbinate, about 1 mm long and wide; glands 4, oblong, ochroleucous, cupped, *ca.* 0.2 mm wide; appendages slightly wider than glands, white, margins crenate to erose; staminate flowers 5-10 per cyathium; styles of pistillate flowers 3, *ca.* 0.5 mm long, notched; capsules ovoid, glabrous, acutely 3-angled, 1-1.3 mm long; seeds narrowly ovoid, with rounded angles, 0.8-1 mm long, brownish with a white coat, facets smooth to finely wrinkled.





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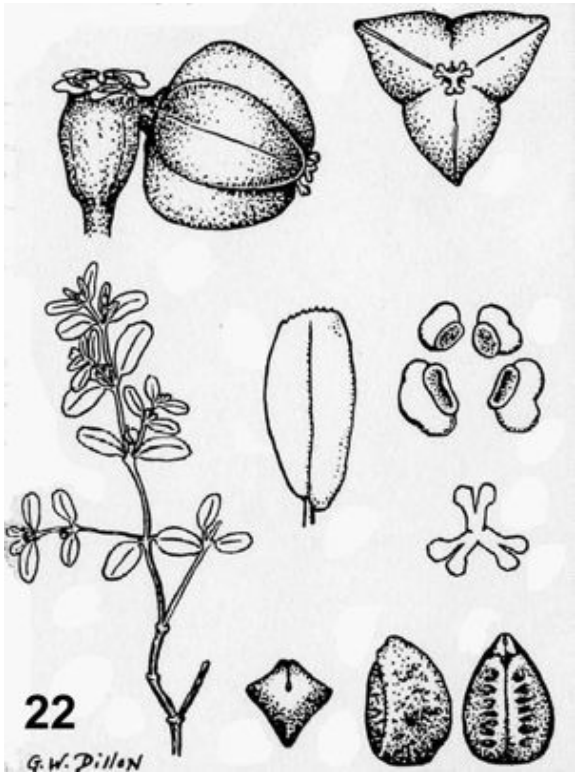
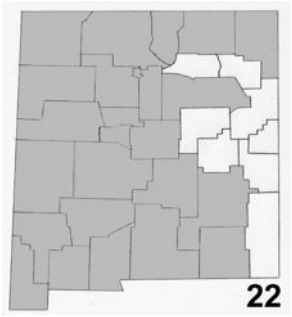
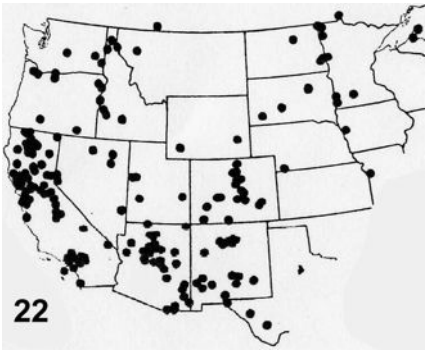
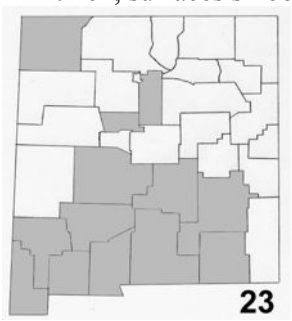
22 ***Chamaesyce serpyllifolia*** Prostrate to ascending annual; stems few to numerous, 5-35 cm long, 0.5-1.5 mm thick, glabrous, much branched, upper nodes sometimes winged; leaves opposite, quite variable in shape, linear-oblong to oblong, elliptic or obovate-oblong, glabrous, 3-15 mm long, 1.5-4 times as long as wide, base inequilateral, apex rounded, marginally toothed at least at the apex, glabrous; stipules distinct, linear, entire or few parted, 1-1.5 mm long; cyathia solitary at the nodes; involucres obconic-campanulate to turbinate, 0.5-1 mm long, 0.8-1.2 mm wide, mostly glabrous; glands 4, sessile to short-stalked, transversely oblong 0.2-0.5 mm long; appendages white, from shorter than to as long as gland is wide, margins entire to crenulate or subdentate; staminate flowers 5-18 per cyathium; styles of pistillate flowers 3, 0.2-0.5 mm long, notched or shortly bifid; capsules ovoid, 3-angled, 1.3-1.8 mm long, broadest below, glabrous; seeds quadrangular-ovoid, 1-1.4 mm long, surfaces smooth to slightly punctuate or indistinctly wrinkled.

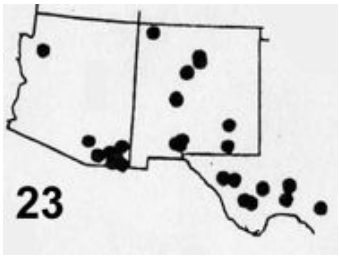


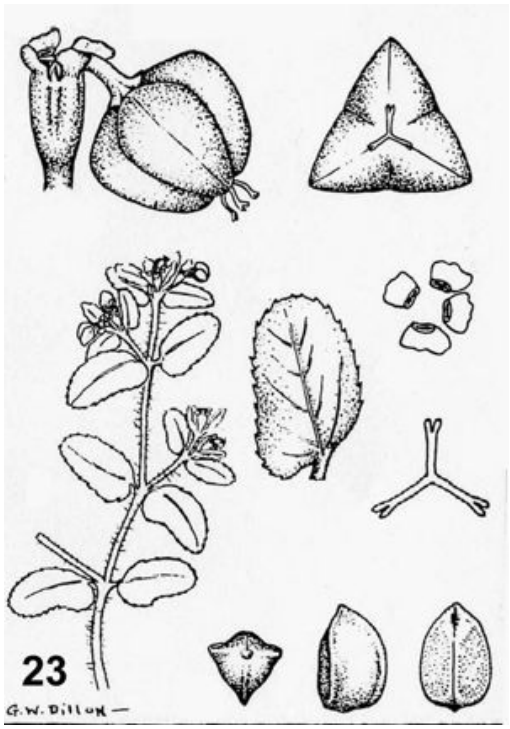




23 *Chamaesyce serrula* Prostrate annual; stems few to many, 5-25 cm long, 0.5-1 mm thick, pilose with spreading hairs; leaves opposite, oblong to oblong-lanceolate or oblong-obovate, 3-11 mm long, 2-8 mm wide, pilose below, sparsely pilose to glabrate above, rounded at the apex, strongly inequilateral at the base, margins of larger leaves sharply serrate, smaller less so to subentire, petioles 0.5-1 mm long; stipules distinct, deltoid-attenuate, 1-2 mm long, laciniate to 3-lobed, the central lobe often longer than lateral lobes; cyathia solitary at nodes, but sometimes appearing clustered due to shortened internodes; involucres obconic-campanulate, 0.5-1 mm long, *ca.* 1 mm wide, glabrous to sparsely pilose outside; glands 4, oblong to subcircular, 0.1-0.5 mm wide, slightly concave; appendages white, 1-3 times as long as glands are wide, rounded, margins entire to crenulate or sometimes erose; staminate flowers 7-13 per cyathium; styles of pistillate flowers 3, 0.3-0.4 mm long, bifid from half to nearly entire length; capsules broadly ovoid, obtusely triangular, 2-2.5 mm long, 3-3.5 mm broad, glabrous; seeds ovate to oblong-ovate, sharply quadrangular, 1.5-2 mm long, *ca.* 1 mm thick, surfaces smooth, chalky-white to grayish-white.







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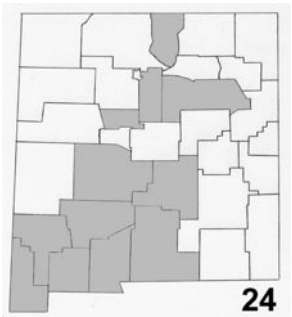
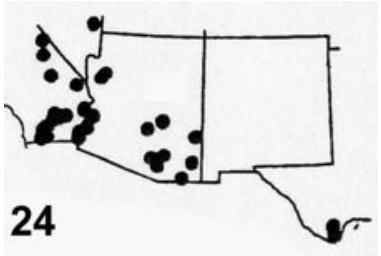
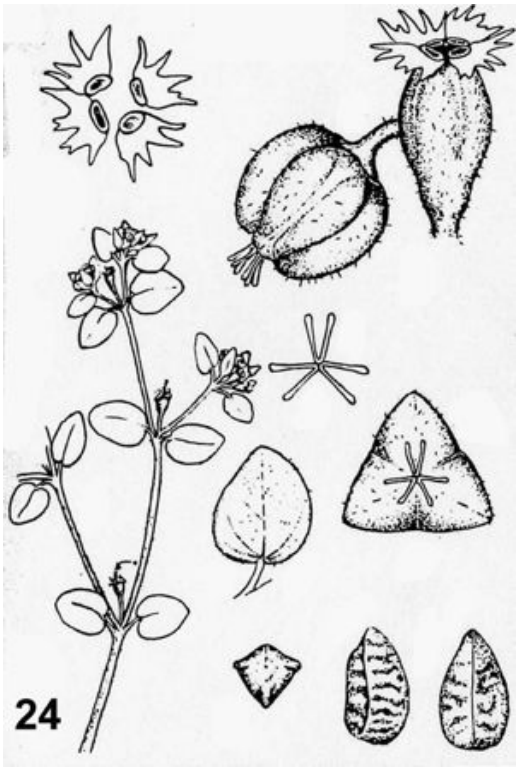
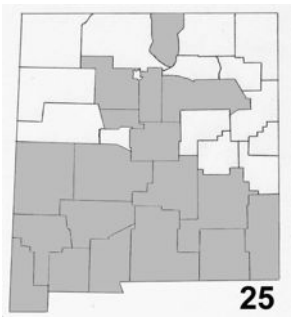
24 *Chamaesyce setiloba* Prostrate annual; stems several, 5-20 cm long, 0.5-1 mm thick, with white, spreading, microscopically tapering hairs, distal internodes often much reduced to form headlike clusters of leaves and involucres; leaves opposite, ovate to oblong-ovate, 2-7 mm long, 1.5-4 mm wide, rounded at apex, base oblique, margins entire, surfaces with hairs as stem, less dense on upper sides, petioles 0.5-1 mm long; stipules minute or obsolete; cyathia solitary at the nodes; involucres long turbinate to urcelolate, 1-1.3 mm long, 0.8-1 mm wide, shortly hairy outside; glands 4, red, transversely elliptic, 0.1-0.2 mm long, concave; appendages white to pinkish, 0.5-1 mm long, parted into 3-5 narrow attenuate segments; staminate flowers 3-7 per cyathium; styles of pistillate flowers 3, 0.2-0.5 mm long, bifid nearly or quite to the base; capsules ovoid to subglobose, sharply 3-angled, 1-1.4 mm long, villous; seeds oblong-quadrangular, *ca.* 1 mm long, facets with low irregular wrinkles, whitish.

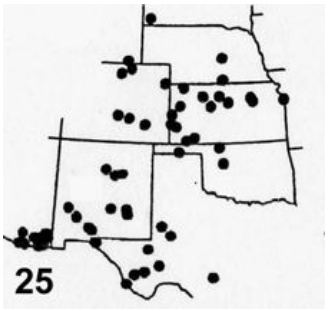


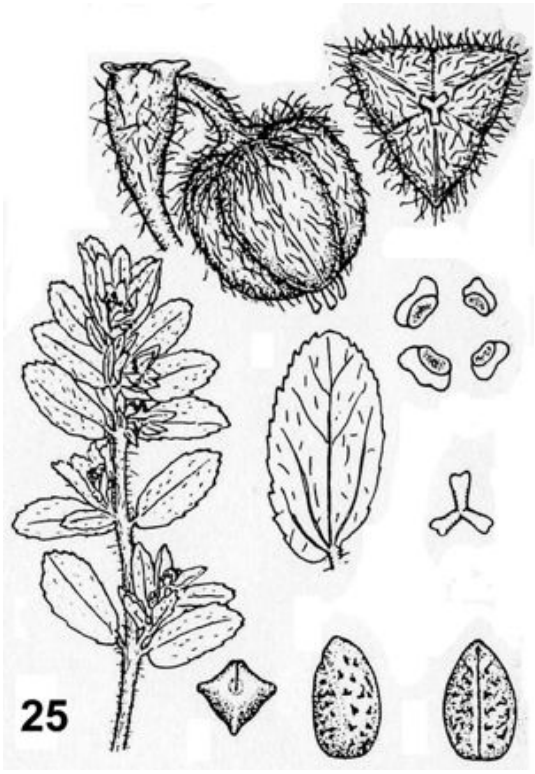




25 *Chamaesyce stictospora* Prostrate to ascending annual; stems several, 5-25 cm long, 0.5-1.5 mm thick, crisply villous, internodes 1-2 cm long; leaves opposite, suborbicular or ovate to oblong or obovate, 3-10 mm long, 2-5.5 mm wide, short crisply villous below, less so to glabrate above, marginally sharply serrate, at least at the apex, base inequilateral, petioles *ca*. 1 mm long; stipules distinct or united, triangular to deltoid, ca. 1 mm long, attenuate to sometimes laciniate; cyathia mostly on short, leafy, congested, lateral branches, sometimes solitary at nodes; involucres turbinate to obconic, 0.7-0.9 mm long, 0.7-1 mm wide, pubescent outside; glands transversely elliptical, oblong or suborbicular, 0.1-0.3 mm wide, often red; appendages from shorter than to somewhat longer than the glands are wide, white to pinkish, margins subentire to crenulate or toothed; staminate flowers 3-7 per cyathium; styles of pistillate flowers 3, *ca.* 0.2 mm long, entire to emarginate; capsules ovoid, roundly triangular, 1.4-1.9 mm long, strigose or with some spreading hairs; seeds oblong, sharply quadrangular, 1.1-1.4 mm long, apically acute, base truncate, surfaces shallowly pitted to faintly transversely rugose.







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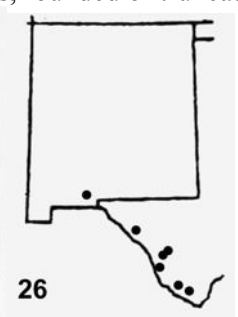
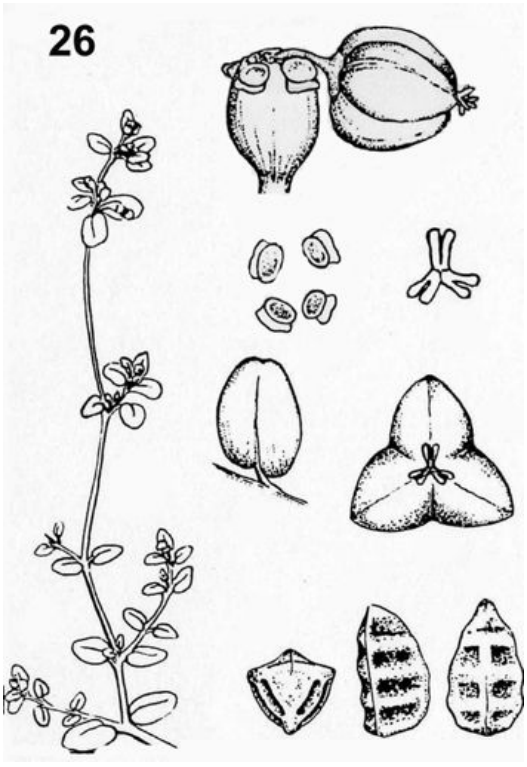
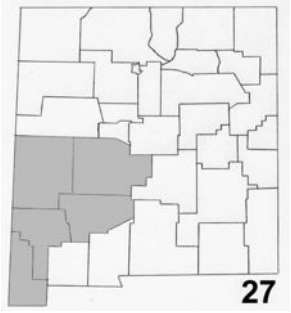
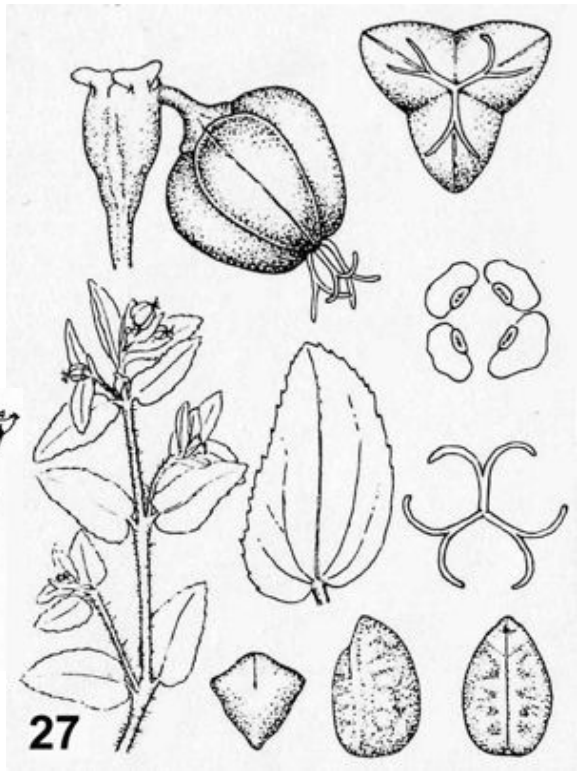
26 *Chamaesyce theriaca* var. ***spurca*** Prostrate to ascending annual; stems several to many, 5-25 cm long, 0.5-1.4 mm thick, glabrous, much branched; leaves opposite, ovate or obovate to ovate-orbicular or shortly oblong, 3-5.5 mm long, glabrous, margins entire, apex rounded or truncate, sometimes emarginate, petioles 0.7-1.0 mm long; stipules 0.7-1.0 mm long, ventral mostly united into an entire or slightly bifid scale, dorsal mostly distinct, subulate, entire; cyathia solitary at distal nodes; involucres turbinate-campanulate to hemispheric, 1.3-1.4 mm in diameter, 1-1.8 mm long, glabrous outside; glands 4, subsessile, 0.3-0.7 mm long, transversely elliptic to sub-orbicular; appendages semilunate to bib-shaped, narrower than gland is long, margins mostly entire; staminate flowers 20-36 per cyathium; styles of pistillate flowers 3, 0.3-0.4 mm long, bifid half or more of length; capsules ovoid, 1.2-1.6 mm long, 1.5-1.7 mm broad, strongly and subacutely 3-lobed, glabrous; seeds oblong-quadrangular, 1-1.2 mm long, 0.7-0.8 mm thick, with 2-4 high rounded ridges passing slightly through the sharp angles, rounded or truncate at the base.





27 *Chamaesyce vermiculata* Prostrate to suberect annual; stems few to several from the base, 10-40 cm long, sparsely pilose; leaves opposite, ovate to lanceolate, 5-18 mm long, upper surface mostly glabrous, lower surface pilose especially towards the base, margins serrulate, petioles about 1 mm long; stipules 0.5-1.0 mm long, distinct or united, margins fimbriate to ciliate or divided into linear segments; cyathia solitary at nodes or terminal on branches; involucres obconic to subcampanulate, *ca.* 1 mm long, 0.7-1.0 mm broad; glands 4, elliptical to subcircular, stalked, 0.2-0.3 mm long; appendages white, *ca.* 0.5 mm long, entire or somewhat lobed or toothed; staminate flowers 5-15 per cyathium; styles of pistillate flowers 3, bifid halfway or more to the base, about 0.5 mm long; capsules broadly ovoid, glabrous, 1.6-1.9 mm long; seeds quadrangular 1-1.4 mm long, *ca.* 1 mm thick, ovoid, surfaces smooth or slightly wrinkled, grayish-brown to pale gray.





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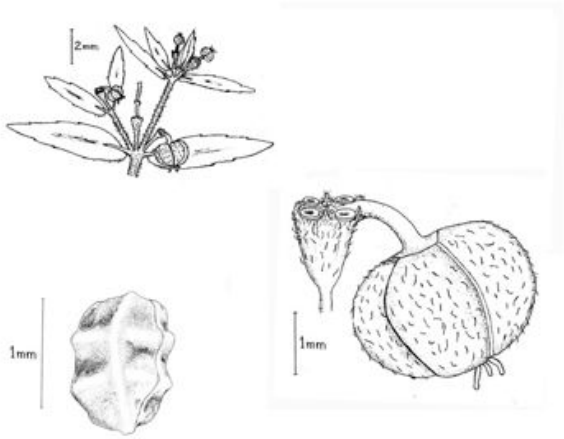
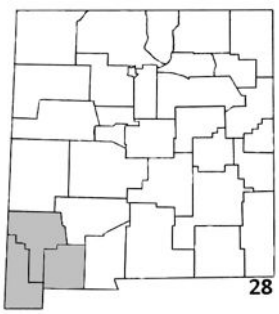
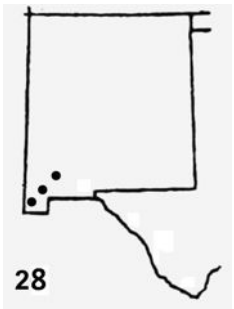
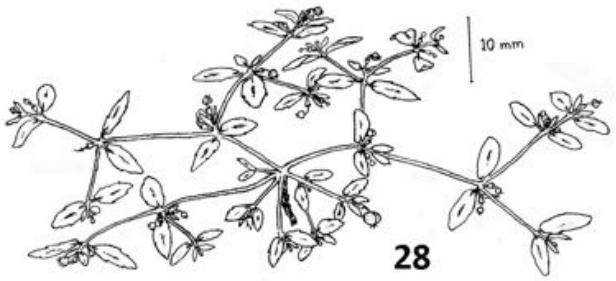
28 *Euphorbia rayturneri* Prostrate annual; stems few to several 5-25 cm long, terete, strigulose with white recurved hairs 0.1-0.2 mm long, internodes 0.6-2.2 cm long, leaves opposite, 0.5-1.1 cm long, 0.2-0.5 cm wide, ovate to elliptic, upper surface glabrescent, lower surface strigulose, base asymmetric, margin serrulate; stipules separate, filiform, 0.6-0.9 mm long, pilose; cyathia solitary, involucre obconical 0.9-1.2 mm long, 0.8-1.2 mm wide, strigulose outside; glands 4 circular to transversely oblong, 0.2 mm long, 0.2-0.3 mm wide, green, yellow or light pink, appendages absent or reduced to a narrow margin; staminate flowers 5-8; styles of pistillate flowers 0.3-0.4 mm long, undivided; capsules oblate, 3-lobed, 1.7-2.0 mm long, 2.2-2.7 mm wide, strigulose; seeds broadly ovoid, triangular in cross-section, 1.2-1.4 mm long, 1.0-1.1 mm wide, with 2 well-defined transverse ridges that do not pass through the dorsal keel.









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Appendix: Representative Specimens

Note: Herbaria are listed for each specimen. (*) indicates the personal herbarium of Roger Peterson, New Mexico Natural History Institute, housed at the Randall Davey Audobon Center, Santa Fe, NM.

Chamaesyce abramsiana

Luna Co.: Jercinovic, 805 (UNM)

Chamaesyce acuta

Eddy Co.: Worthington, R. 27548 (UTEP). Lincoln Co.: Hutchins, R. 8693 (UNM). Otero Co.: Worthington, R. 33825 (UTEP). Sierra Co.: Beals s.n. (US). Socorro Co.: Sivinski, R.C. 4589 (UNM).

Chamaesyce albomarginata

Bernalillo Co.: Dittmer, H.J. 7073 (UNM). Catron Co.: Lambert, S. 979 (UTEP). Chaves Co.: Castetter 7065 (UNM). Cibola Co.: McCallum, Arch 1094 (UNM). DeBaca Co.: Clark, Ora M. 15223 (UNM). Doña Ana Co.: Worthington, R. 13638 (UTEP). Eddy Co.: Worthington, R. 30413 (UTEP). Grant Co.: Worthington, R. 27170 (UTEP). Hidalgo Co.: Worthington, R. 32514 (UTEP). Lincoln Co.: Hutchins, R. 3382 (UNM). Luna Co.: Worthington, R. 24569 (UTEP). McKinley Co.: Camazine, Scott 038 (UNM). Otero Co.: Allred, Kelly W. 8392 (NMCR). Quay Co.: Cully, Anne 1168 (UNM). Roosevelt Co.: Tierney, Gail 89A (ENMU). Sandoval Co.: Robertson, C. 61 (UNM). San Juan Co.: Allred, Kelly W. 6274 (NMCR). Sierra Co.: Martin, William C. 4820 (UNM). Socorro Co.: Martin, William C. 3207 (UNM).

Chamaesyce arizonica

Doña Ana Co.: Worthington, R. 20769 (UTEP). Grant Co.: Peterson, Roger (*). Luna Co.: Jercinovic 715 (NMC).

Chamaesyce capitellata

Grant Co.: (SNM). Hidalgo Co.: Worthington, R. 26356 (UTEP). Luna Co.: Worthington, R. 26528

Chamaesyce carunculata

Chaves Co.: Allred, Kelly W. 9433 (NMCR)

Chamaesyce dioica

Doña Ana Co.: Worthington, R. 6506 (UTEP). Grant Co.: Zimmerman, Dale A. 4587 (SNM). Hidalgo Co.: Worthington, R. 32887 (UTEP). Luna Co.: Worthington, R. 19961 (UTEP). Sierra Co.: Wagner, W.L. 455 (UNM).

Chamaesyce fendleri var. ***fendleri***

Bernalillo Co.: Roeder, Carol s.n. (UNM). Chaves Co.: Worthington, R. 16539 (UTEP). Cibola Co.: McCallum, Arch 1328 (UNM). Colfax Co.: Jones, Craig B. 97 (UNM). DeBaca Co.: Hutchins, R. 8275 (UNM). Doña Ana Co.: VonLoh, J. 53 (UNM). Eddy Co.: Powell & Van Pelt s.n Los Medanos voucher 1491 (UNM). Grant Co.: Fletcher, R. 7415 (UNM). Harding Co.: Spellenberg, R. & R. Fletcher 5343 (UNM). Hidalgo Co.: Worthington, R. 20652 (UTEP). Lea Co.: Martin, Marley, Powell & Knight 1465 (UNM). Lincoln Co.: Sivinski, R.C. 4577 (UNM). Los Alamos Co.: Tierney, G. & T. Foxx 4 (UNM). Luna Co.: Worthington, R. 3427 (UTEP). McKinley Co.: McCallum, Arch 1070 (UNM). Otero Co.: Fletcher, R. & W. Haggren 548 (UNM). Quay Co.: Castetter 7075 (UNM). Roosevelt Co.: Bleakly, D. & DeBruin 36a (UNM). Sandoval Co.: Sivinski, R.C. and P.C. Tonne 4860 (UNM). San Juan Co.: Castetter 7074 (UNM). San Miguel Co.: Fletcher, R. 6792 (UNM). Santa Fe Co.: McKinley J.W. 53 (UNM). Sierra Co.: Fink, Ralph W. 864 (NMCR). Socorro Co.: Mygatt, J. & T. Maddux 2015 (UNM). Torrance Co.: Sivinski, R.C. & Jercinovic 5696 (UNM). Valencia Co.: Riffle, Nancy 1546 (UNM).

Chamaesyce fendleri var. ***chaetocalyx***

Bernalillo Co.: Castetter 7071 (UNM). Catron Co.: Wooton, E.O. 2880 (UNM). Chaves Co.: Manthey, T. & W.L. Wagner 965 (UNM). Cibloa Co.: Riffle W.L. 314b (UNM). Eddy Co.: Knight, P. 2406 (UNM). Guadalupe Co.: Castetter 7064 (UNM). Hidalgo Co.: Worthington, R. 27325 (UTEP). Lincoln Co.: Hutchins R. 8684 (UNM). Luna Co.: Jercinovic 714 (UNM).

McKinley Co.: Wagner, W.L. 2654 (UNM). Otero Co.: Hutchins, R. 3589 (UNM). Rio Arriba Co.: Toll, Clary, & Mongold 15 (UNM). Sandoval Co.: Wagner, W.L. 2063 (UNM). San Juan Co.: Marley, G.A. 1707 (UNM). Santa Fe Co.: Reif, Brian 5864 (UNM). Sierra Co.: Metcalfe, O.B. 1488 (UNM). Socorro Co.: Manthey 427 (UNM). Valencia Co.: Fletcher, R. & T. Manthey 7 (UNM).

Chamaesyce geyeri

Chaves Co.: Allred, Kelly W. 9434 (NMCR). Roosevelt Co.: Bleakly, D. & DeBruin 279 (UNM). Socorro Co.: Worthington, R. 14751 (UTEP).

Chamaesyce glyptosperma

Bernalillo Co.: Dunbar, Terry 320 (UNM). Chaves Co.: Peterson, Roger (*). Doña Ana Co.: Allred, Kelly W. 6334 (NMCR). Eddy Co.: Van Pelt s.n. (UNM). Hidalgo Co.: Worthington, R. 9086 (UTEP). Lea Co.: Martin Powell, Marley, & Knight s.n. (UNM). Luna Co.: Worthington 15022 (UTEP). McKinley Co.: Wagner, W.L. 2612 (UNM). Rio Arriba Co.: Heil, K. & W. Mietty 15482 (SJNM). San Juan Co.: Wagner, W.L. 2380 (UNM). San Miguel Co.: Rose & Fitch 17620 (NY). Santa Fe Co.: Peterson, R.S. 132 (NMCR). Socorro Co.: Jercinovic 717 (UNM). Sierra Co.: Fink, Ralph W. 660 (NMCR).

Chamaesyce hirta

Hidalgo Co.: Allred, Kelly W. 4275 (NMCR).

Chamaesyce hyssopifolia

Catron Co.: Sivinski, R.C. & P.C. Tonne 5111 (UNM). Doña Ana Co.: Worthington, R. 6601 (UTEP). Grant Co.: Zimmerman, D.A. 5003 (SNM). Hidalgo Co.: Allred, Kelly W. 4276 (NMCR). Luna Co.: Worthington, R. 19956 (UTEP). Otero Co.: Hutchins, R. 13137 (UNM). Socorro Co.: Fleetwood s.n. (UNM). Sierra Co.: Worthington 27797 (UTEP).

Chamaesyce lata

Chaves Co.: Clark, Ora 8893 (UNM). DeBaca Co.: Hutchins, R. 8276 (UNM). Doña Ana Co.: Castetter 2327 (UNM). Eddy Co.: Worthington 27552 (UTEP). Lea Co.: Kennemore 2282 (NMCR). Lincoln Co.: Hutchins, R. 1815 (UNM). Otero Co.: Worthington 33754 (UTEP). Quay Co.: Lowrey, T.K. & P.C. Tonne 1799 (UNM). Roosevelt Co.: Allred, Kelly W. 9397 (NMCR). San Miguel Co.: Ivey, R.D. s.n. (UNM). Sierra Co.: Fink, Ralph W. 792 (NMCR). Socorro Co.: Foster, M. 173 (UNM). Torrance Co.: Forbes 285 (NMCR). Valencia Co.: Castetter 2325 (UNM).

Chamaesyce maculata

Bernalillo Co.: Jercinovic 724 (UNM). Doña Ana Co.: Allred, Kelly W. 8175 (NMCR). Hidalgo Co.: Worthington 27005 (UTEP).

Chamaesyce micromera

Chaves Co.: Peterson, Roger (*). Doña Ana Co.: Allred, Kelly W. 8470 (NMCR). Grant Co.: Worthington, R. 27164 (UTEP). Hidalgo Co.: Worthington, R. 11530 (UTEP). Lincoln Co.: Forbes, Adam C. 105 (NMCR). Luna Co.: Jercinovic 616 (UNM). Otero Co.: Worthington, R. 30232 (UTEP). Socorro Co.: Worthington, R. 14750 (UTEP).

Chamaesyce missurica

Chaves Co.: Earle, F.S. & E.S. 279 (NY). Eddy Co.: Martin, Powell, Knight, Marley s.n., Los Medanos Voucher 30 (UNM). Lea Co.: Standley, Paul 40362 (US). Quay Co.: Castetter 7062 (UNM). Roosevelt Co.: Bleakly, D. & DeBruin 436 (UNM). San Juan Co.: Anderson 4340 (NMCR). Socorro Co.: Allred, Kelly W. 7907 (NMCR). Union Co.: Clark, Ora M. 16176 (UNM).

Chamaesyce nutans

Eddy Co.: Peterson, Roger (*). Hidalgo Co.: Allred, Kelly W. 6007 (NMCR).

Chamaesyce parryi

Bernalillo Co.: Dittmer, H.J. 168 (UNM). Catron Co.: Fletcher, R. 1464 (UNM). Chaves Co.: Heil, K. 11237 (SJNM). Doña Ana Co.: Fletcher, R. 5681 (UNM). Eddy Co.: Heil, K. 11255 (SJNM). Grant Co.: Columbus, J. Travis 1850 (NMCR). Luna Co.: Jercinovic 824 (UNM). Otero Co.: Worthington, R. 33843 (UTEP). Rio Arriba Co.: Heil, K. & Wayne Mietty 15502 (SJNM). Roosevelt Co.: Martin, James S. 798 (ENMU). Sandoval Co.: Clark, Ora M. 14047 (UNM). San Juan Co.: McCallum, Arch 1332 (UNM). Sierra Co.: Peterson, Roger (*). Socorro Co.: Hutchins, R. 8483 (UNM). Valencia Co.: Clark, Ora M. 10339 (UNM).

Chamaesyce prostrata

Bernalillo Co.: Sivinski, R.C. 5151 (UNM). Doña Ana Co.: Allred, Kelly W. 8391 (NMCR). Eddy Co.: Worthington, R. 32845 (UTEP). Grant Co.: Huff, C.A. 1814 (SNM). Guadalupe Co.: Bleakley, D.L. 4210 (UNM). Luna Co.: Worthington 12444 (UTEP). Roosevelt Co.: Sanchez, Dorothy 39 (ENMU). San Juan Co.: Heil, K. 15768 (SJNM). Socorro Co.: Durkin, P. & M.P. Bradley 94PD092/F3 (UNM).

Chamaesyce revoluta

Bernalillo Co.: Gordon, S. & K. Norris 28 (UNM). Catron Co.: Fletcher, R. 1577 (UNM). Cibola Co.: McCallum, Arch 1365 (UNM). Doña Ana Co.: Allred, Kelly W. 9487 (NMCR). Grant Co.: Worthington, R. 7664 (UTEP). Hidalgo Co.: Allred, Kelly W. 9020 (NMCR). Lincoln Co.: Hutchins, R. 3736 (UNM). Luna Co.: Worthington, R. 25827 (UTEP). Sandoval Co.: Tonne, P.C. s.n. (UNM). San Juan Co.: Peterson, Roger (*). Santa Fe Co.: Peterson, R.S. 185 (NMCR). Sierra Co.: Fink, Ralph W. 871 (UNM) Socorro Co.: Manthey 517 (UNM). Torrance Co.: Sivinski, R.C., Jercinovic 5660 (UNM). Valencia Co.: Marley, G.A. 941 (UNM).

Chamaesyce serpens

Chaves Co.: Earle, F.S. & E.S. 308 (US). Doña Ana Co.: Wooton, E.O. s.n. (US). Eddy Co.: Tracy, S.M 8170 (US). Grant Co.: Worthington, R. 7673 (UTEP). Santa Fe Co.: Wagner, W.L. 2788 (UNM). Socorro Co.: Jercinovic 718 (UNM). Torrance Co.: Forbes, Adam C. 175 (NMCR). Valencia Co.: Rusby, H.H. 378 ½ (M).

Chamaesyce serpyllifolia

Bernalillo Co.: Barlow-Irick, P. 93-106 (UNM). Catron Co.: Johnson, Susannah B. 598 (NMCR). Chaves Co.: Earle, F.S. 273 (NY). Cibola Co.: McCallum, Arch 1216 (UNM). Colfax Co.: Walter, Dick & Verda 8206 (SJNM). Doña Ana Co.: Allred, Kelly W. 6469 (NMCR). Eddy Co.: Worthington, R. 30202 (UTEP). Grant Co.: Allred, Kelly W. 8374 (NMCR). Hidalgo Co.: Allred, Kelly W. 8560 (NMCR). Lincoln Co.: Allred, Kelly W. 9484 (NMCR). Los Alamos Co.: Foxx & Tierney 569 (UNM). Luna Co.: Columbus, J. Travis 1822 (NMCR). McKinley Co.: McCallum, Arch 1277 (UNM). Otero Co.: Sax, D.F. 118 (UNM).

Rio Arriba Co.: Heil, K. 15830 (SJNM). Sandoval Co.: Hartman, R.L. 73792 (UTEP). San Juan Co.: Spellenberg, R., D.G.Ward & L. Collyer 6125 (UNM). San Miguel Co.: Gordon, S. & K. Norris 507 (UNM). Santa Fe Co.: Peterson, R.S. 135 (NMCR). Sierra Co.: Roalson, E.H. 169 (NMCR). Socorro Co.: Maddux, Troy & Sam Loftin 186b (UNM). Taos Co.: Martin, W.C. 6026 (UNM). Torrance Co.: Sivinski, R.C. & Jercinovic 5665 (UNM). Union Co.: Chauvin, Y. & A. Browder 02CV004-F18 (UNM). Valencia Co.: Osborn, Neal 845 (UNM).

Chamaesyce serrula

Bernalillo Co.: Roeder, Carol s.n. (UNM). Chaves Co.: Earle, F.S. & E.S. 285 (US). Doña Ana Co.: Allred, Kelly W. 7292 (NMCR). Eddy Co.: Mygatt, J. 5 (UNM). Grant Co.: Worthington 27165 (UTEP). Hidalgo Co.: Worthington 27136 (UTEP). Lincoln Co.: Hutchins, R. 2431 (UNM). Luna Co.: Columbus, J. Travis 469 (NMCR). Otero Co.: Worthington, R. 30243 (UTEP). San Juan Co.: Standley, P.C. 7053 (US). Santa Fe Co.: Peterson, R.S. 199 (NMCR). Sierra Co.: Fletcher, R., B. Crowder, K. Clary 6629 (UNM). Socorro Co.: Fletcher, R. 2413A (UNM).

Chamaesyce setiboba

Bernalillo Co.: Castetter 7087 (UNM). Doña Ana Co.: Worthington, R. 17227 (UTEP). Grant Co.: Greene, E.L. 265 (M). Hidalgo Co.: Worthington, R. 15146 (UTEP). Lincoln Co.: Hutchins, R. 3445 (UNM). Luna Co.: Jercinovic 615 (UNM). Otero Co.: Worthington 33910 (UTEP). Santa Fe Co.: Kennedy, Amanda 01AK003-F10 (UNM). Sierra Co.: Peterson, Roger (*). Socorro Co.: Loftin , Sam & Troy Maddux 236 (UNM). Taos Co.: Castetter 7078 (UNM).

Chamaesyce stictospora

Bernalillo Co.: Roeder, Carol s.n. (UNM). Catron Co.: Eggleston 20424 (G). Chaves Co.: Carter, Gail GC26 (ENMU). Doña Ana Co.: Allred, Kelly W. 6496 (NMCR). Eddy Co.: Worthington, R. 32864 (UTEP). Grant Co.: Jercinovic 530 (SNM). Hidalgo Co.: Worthington, R. 27151 (UTEP). Lea Co.: Martin, W.C., Powell, Marley, Knight s.n. (UNM). Lincoln Co.: Hutchins, R. 3445 (UNM). Luna Co.: Worthington, R. 14648 (UTEP). Otero Co.: Allred, Kelly W. 9516 (NMCR). Sandoval Co.: Clark, Ora M. 9888 (UNM). San Miguel Co.: Atwood, N.D. 21409 (UNM). Santa Fe Co.: McKinley, J.W. 54 (UNM). Sierra Co.: Fink, Ralph W. 871 (NMCR). Socorro Co.: Foster, M. 138 (UNM). Taos Co.: Nelson, A. 7078 (UNM). Torrance Co.: Jercinovic 611 (UNM).

Chamaesyce theriaca

Doña Ana Co.: Worthington, R. 14696 (UTEP).

Chamaesyce vermiculata

Catron Co.: Hutchins, R. 9120 (UNM). Grant Co. Maguire, Richards, & Moeller 11982B (G). Hidalgo Co.: Wagner, W. 1393 (UNM). Sierra Co.: Peterson, Roger (*). Socorro Co.: Wooton, E.O. s.n. (US).

Euphorbia rayturneri

Grant Co.: Jercinovic 827 (NMC). Hidalgo Co.: R.M. Turner 96-19 (ARIZ). Luna Co.: Spellenberg 6217 (NMC).