

NOTES ON *CHAMAESYCE* (EUPHORBIACEAE)
IN FLORIDA

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ABSTRACT

Twenty-three species of *Chamaesyce* are presently known to grow in Florida. A new key to the Florida species is presented along with notes on taxonomically important morphological characters in the genus and a review of the various names applied to each species.

Key Words: *Chamaesyce*, Florida

INTRODUCTION

Species of *Chamaesyce* in Florida are easy to identify once learned, but the learning process is significantly impeded by the available literature. A large part of the confusion has arisen due to a change in the application of several names between 1933 and 1965. In the worst case, the name *C. maculata* is applied to two entirely different species, both very widespread and common, in regional floras frequently used to identify plants collected in Florida. More confusion is created by the specialized vocabulary used in descriptions of species from this group. Finally some of the confusion must be attributed to the continued use of some inappropriate characters in identification keys.

The major purpose of this paper is to provide a unified treatment of the Florida species. Following a discussion of some taxonomic characters of particular importance in the identification of *Chamaesyce* species, a key to the Florida species is presented. Finally, additional notes are provided on the identification of species and a guide to the previous treatment of each species in regional literature.

GENERAL CHARACTERISTICS OF *CHAMAESYCE*

With some exceptions, species of *Chamaesyce* are small, herbaceous plants. They grow best in sunny, sparsely vegetated areas and are often conspicuous weeds where the soil surface is cleared frequently (such as gardens) or competing vegetation is held in check by frequent mechanical disturbance (especially roadsides).



Most of the species in Florida are annuals. Only a few species with West Indian affinities (restricted to southernmost Florida) are perennial. A few of the larger species occasionally develop a small woody base and one coastal species (*C. mesembryanthemifolia*) is a subshrub.

Leaves are opposite (distichous), stipulate and usually have distinctly inequilateral bases. Stipules may be either united or free. Veins are surrounded by specialized sheath cells associated with C4 metabolism.

TAXONOMICALLY IMPORTANT MORPHOLOGICAL CHARACTERS

Small (1933) used growth habit (stems erect versus stems prostrate) as one of the primary characters for distinguishing species in his treatment of the genus. Despite having recognized the limitations of habit in an unpublished dissertation (Burch, 1965), Burch (1966) retained it as an important character in his key to the species. More useful for identification is the differentiation between upper and lower stem surfaces in some pubescent species, a character independent of the habit of an individual plant. (This differentiation is found in species that commonly have prostrate growth form, so it is reasonable to speak of upper and lower surfaces.) When examining specimens, it is important to realize that prostrate growing plants are often mounted on herbarium sheets in such a way that only the lower side of the stems is visible. It may be necessary to search carefully along the sides of the stems on such specimens to find the pubescence characteristic of the upper stem surface.

Leaf shape can often be used to place specimens in small groups of species (Figure 1). The presence of serrate or dentate leaf margins is as important as overall leaf shape. In most cases, the presence of serration is clear, although it may be so only under magnification. In *Chamaesyce blodgettii*, some of the larger leaves on every specimen will have a few dentations but most leaves will have entire margins. Another leaf characteristic of some importance is thickness. Most species have a thin lamina. When such leaves are examined using transmitted light, the bundle sheaths surrounding the veins in the leaves show up as a dark reticulate network in the lamina. In the *C. deltoidea* complex and the *C. garberi* complex, however, the leaf lamina is sufficiently thick that the bundle sheaths do not contrast strongly. This is

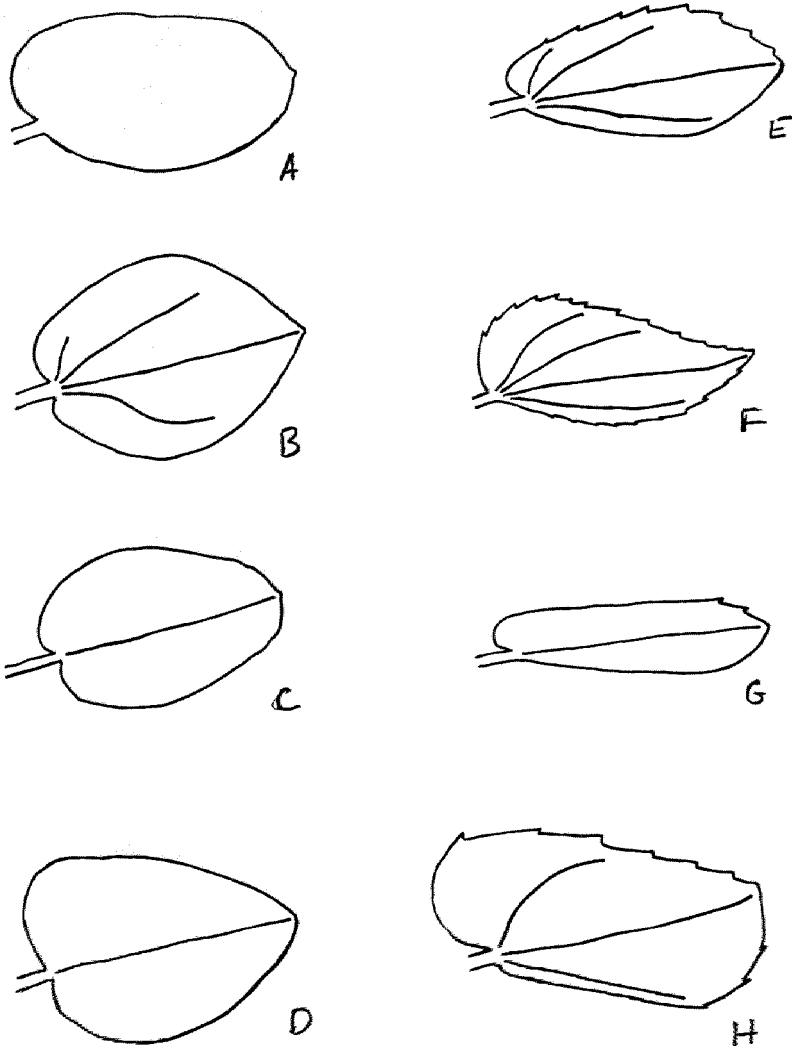


Figure 1. Variation in leaf shape among Florida species of *Chamaesyce*. A-D. Leaves with entire margins. A. *C. blodgettii*, B. *C. mesembryanthemifolia*, C. *C. porteriiana* group, D. *C. deltoidea*. E-H. Leaves with serrate margins. E. *C. hyssopifolia* group, F. *C. hirta* group, G. *C. maculata* group, narrow leaf forms, H. *C. adenoptera* group.

particularly important because it provides an easy way to distinguish *C. blodgettii* from *C. porteriana*. The taxonomic importance of the presence or absence of a cyanic blotch near the center of the leaf blade has been overemphasized. In species possessing this feature, the pigmented area may be present or absent on individual plants. In other words, the absence of this coloration is not informative.

Pubescence provides particularly useful characters for the identification of species. In general, the presence or absence of pubescence on capsules and/or stems is used to separate species, although *Chamaesyce deltoidea*, as treated herein, contains both glabrous and densely pubescent populations and *C. hyssopifolia* includes glabrous and slightly pubescent individuals.

Position and arrangement of groups of cyathia is very useful for the recognition of species. There is, in fact, a continuum in arrangements from solitary cyathia in leaf axils through the production of slightly modified axillary branch systems bearing solitary axial cyathia to highly modified axillary branch systems with dichotomous or pseudo-dichotomous branching and leaves reduced to bract-like structures or completely missing. The important distinction in the key is between the dichotomously branched inflorescences and all other forms.

Glands on most Florida species are elliptic and 2–4 times as long as wide, but some groups show significant variations (Figure 2). Specimens of *Chamaesyce polygonifolia* collected in Florida show irregular gland production with individual cyathia showing variable numbers of glands. Other Florida species produce four glands on each cyathium. Appearance of the petaloid appendages of the glands can be important for the identification of specimens. In the *C. deltoidea* complex and *C. ophthalmica*, these appendages are very narrow or altogether lacking. In the *C. adenoptera* complex, the gland appendages are greatly unequal in size (Figure 2e). In other groups, the gland appendages are conspicuous, at least with a hand lens. Usually, these species show considerable variation in the size of the gland appendages.

Seed structure is more useful for defining related groups of species than for identifying specimens. Most of the Florida species of *Chamaesyce* have dark brown to white, 4-sided seeds. (Immature seeds with a golden brown color generally have the same shape and surface characteristics as mature seed.) However, three Florida species (*C. bombensis*, *C. cumulicola*, and *C. polygoni-*

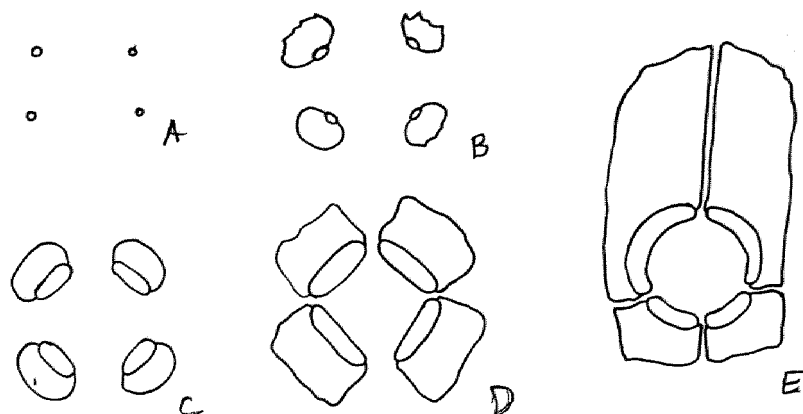


Figure 2. Variation in gland shape among Florida species of *Chamaesyce*. Gland appendages may differ greatly from those depicted. A. Minute circular glands characteristic of *C. hirta* and *C. ophthalmica*, B. Small, elliptic glands characteristic of the *C. polygonifolia* and *C. hyssopifolia* groups, C. Medium size, elliptic glands of the type found on most Florida species of *Chamaesyce*, D. Large, elliptic glands characteristic of the *C. garberi* group, and E. Unequal, lunate glands characteristic of the *C. adenoptera* group.

folia) have rounded seeds without flat sides that are always white at maturity.

Stipules provide useful characters for identifying species of *Chamaesyce* (Figure 3), but they must be used with caution. In most species there is considerable variation in stipule shape from plant to plant, or even from node to node on the same stem, so several stipules must be examined to determine the common shape for a given specimen. It is most important (and difficult) to determine whether the stipules are usually separated or joined. Joined stipules may be completely joined (triangular interpetiolar stipules) or nearly divided and joined only near the base (Figures 3c-3h). Joined stipules can also be torn apart by the expansion of cyathia or branches at their nodes. In some cases, the conspicuousness of the ligule is used as an identification aid. In these cases, the size of the ligule is less important than the contrast between the color of the ligule and the stem.

SYSTEMATIC TREATMENT

Chamaesyce S. F. Gray, Nat. Arr. Bril. Pl. 2: 260. 1821.



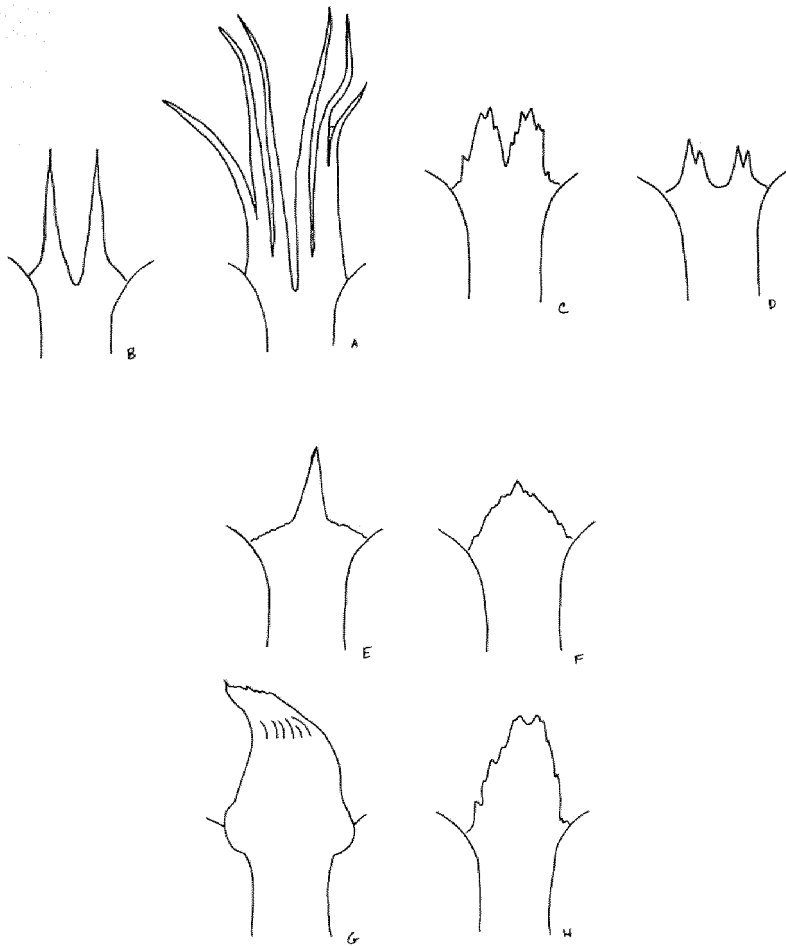


Figure 3. Variation in stipule morphology among Florida species of *Chamaesyce*. Variations in pubescence are not shown. There is often considerable variation in stipules at different nodes of the same plant. A–B. Separate stipules. A. Lacerate stipules characteristic of the *C. polygonifolia* group, B. Long acuminate stipules characteristic of the *C. hirta*, *C. maculata* and *C. adenoptera* groups. C–D. Stipules joined near the base only. C. *C. prostrata*, D. *C. porteri* group. E–H. Stipules joined throughout their length. E. *C. hyssopifolia*, F. *C. mesembryanthemifolia*, G. *C. hypericifolia*, H. *C. blodgettii*.

Herbaceous, occasionally suffrutescent, annuals or perennials (one species in our area a subshrub). Trichomes, when present, simple, multicellular hairs. Leaves opposite, stipulate; the stipules either free or joined; leaf bases usually inequilateral. Inflorescence a cyathium surrounded by 4 glands (rarely fewer) or a 5th gland vestigial; petaloid gland appendages either present or absent. Fruit a trilocular capsule with each locule containing a single seed. The seed ecarunculate but with a distinct linear scar.

The following key assumes that at least immature fruits are present on the specimen.

KEY TO THE SPECIES OF *CHAMAESYCE* IN FLORIDA

1. Capsules glabrous
 2. Cyathia in clusters or in conspicuously reduced, dichotomously branched inflorescences
 3. Plants consistently pubescent on upper part of stem and young leaves . . . *C. nutans* (p. 364)
 - 3a. Plants glabrous throughout or with isolated stems and leaves pubescent
 4. Stipules conspicuous, 1–1.5 mm long, much longer than wide; mature capsules less than 1.3 mm long
 *C. hypericifolia* (p. 364)
 - 4a. Stipules inconspicuous, about .5 mm long, usually not as long as wide; mature capsules more than 1.3 mm long
 *C. hyssopifolia* (p. 364)
 - 2a. Cyathia solitary in leaf axils, terminal, or in reduced, unbranched axillary inflorescences
 5. Stipules separate, lacinate
 6. Seeds more than 2.2 mm long; cyathia evidently terminal on stems
 *C. polygonifolia* (p. 365)
 - 6a. Seeds <1.8 mm long; cyathia either terminal or solitary in leaf axils
 7. Seeds 1.5–1.8 mm long; leaves often appearing somewhat fleshy
 *C. bombensis* (p. 365)
 - 7a. Seeds 1.1–1.4 mm long; leaves not appearing fleshy



- 8. Leaves linear to narrowly elliptic, 4–5 times as long as wide, with a red margin
..... *C. cumulicola* (p. 365)
- 8a. Leaves elliptic, less than 2 times as long as wide, concolorous
..... *C. cordifolia* (p. 365)
- 5a. Stipules united
 - 9. Stipules white, conspicuous
 - 10. Stipules about .5 mm; plants creeping herbs, often rooting at nodes
 - 11. Calyx lobes green, less than 2 mm long, appressed to capsule. . . *C. blodgettii* (p. 361)
 - 11a. Calyx lobes white, more than 2 mm long, free from capsule.
..... *C. serpens* (p. 367)
 - 10a. Stipules about 1 mm; plants erect to reclining subshrubs
C. mesembryanthemifolia (p. 367)
 - 9a. Stipules inconspicuous
 - 12. Stems numerous from enlarged rootstock, wiry, less than 1 mm wide at base *C. deltoidea* (p. 362)
 - 12a. Stems usually 4–5 radiating from a taproot, more than 1 mm wide at base
 - 13. Glands .5–.6 mm long, leaves thick *C. porteriana* (p. 363)
 - 13a. Glands .2–.4 mm long, leaves thin . . *C. blodgettii* (p. 361)
- 1a. Capsules pubescent
 - 14. Pubescence most abundant on the angles of the capsule
 - 15. Gland appendages conspicuous, leaves elliptic, light green *C. mendezii* (p. 366)
 - 15a. Gland appendages inconspicuous, leaves widely elliptic, dark green *C. prostrata* (p. 366)
 - 14a. Pubescence spread over the entire surface of the capsule
 - 16. Cyathia in clusters, or in reduced, dichotomously branched axillary inflorescences

- 17. Gland appendages lacking, inflorescences terminal *C. ophthalmica* (p. 364)
- 17a. Gland appendages present, sometimes small; inflorescences axial or terminal
 - 18. Plants coarsely pubescent, trichomes on stem of two types, the larger 3–5 mm long *C. hirta* (p. 363)
 - 18a. Plants finely pubescent, trichomes to 1 mm long *C. lasiocarpa* (p. 364)
- 16a. Cyathia solitary in leaf axils, or in reduced, unbranched axillary inflorescences
 - 19. Gland appendages greatly unequal in size, the larger pair at least twice as large as the smaller
 - 20. Glands elliptic *C. thymifolia* (p. 365)
 - 20a. Glands lunate
 - 21. Stem trichomes appressed, to .3 mm long; gland appendages white *C. pergamena* (p. 361)
 - 21a. Stem trichomes spreading, .5 mm long; gland appendages reddish *C. conferta* (p. 361)
 - 19a. Gland appendages approximately equal in size
 - 22. Stems pubescent on one side only
 - 23. Adventitious roots formed at middle nodes along the stem *C. humistrata* (p. 365)
 - 23a. Adventitious roots not formed
 - 24. Styles clavate .3–.4 mm long, seeds 1.0–1.1 mm long *C. maculata* (p. 365)
 - 24a. Styles slender, .5–.6 mm long, seeds .7–.8 mm long *C. thymifolia* (p. 365)
 - 22a. Stems pubescent on all sides
 - 25. Stems numerous from an enlarged rootstock, less than 1

- mm thick at base
 *C. deltoidea* (p. 362)
 25a. Stems few to several from a tap-
 root, more than 1 mm thick
 at base .. *C. garberi* (p. 362)

NOTES ON SPECIES

Chamaesyce blodgettii (Engelmann ex Hitchcock) Small

Young plants of *Chamaesyce blodgettii* with large leaves and sparse branching look very similar to plants of *C. porteriana*, but are easily distinguished from that species by the small size of the glands and the more prominent stipules. Also, *C. blodgettii* specimens almost always have some (larger) leaves with dentate margins, but this character is rare on specimens of *C. porteriana*. With fresh specimens, the thickness of the leaf blade provides an easy way of distinguishing between the two species. When a leaf of *C. blodgettii* is examined by transmitted light, the network of bundle sheaths appears dark in contrast to the remainder of the lamina. If a leaf of *C. porteriana* is examined in the same way, the network of bundle sheaths are either invisible or indistinct. Heavily branched plants of *C. blodgettii* with small leaves can be confused with *C. serpens* but *C. blodgettii* has more elliptic leaves and less conspicuous stipules. When necessary, the identification can be confirmed by examination of the structure attached to the base of almost mature capsules. In *C. blodgettii*, and most other species of *Chamaesyce*, this structure is a three-lobed pad. The lobes are green, less than 2 mm long and appressed to the capsule. In *C. serpens* the lobes are white, more than 2 mm long, and free from the capsule. The general appearance of *C. blodgettii* in prostrate plants can be very similar to that of *C. maculata*. These species are easily separated by the pubescence of the latter, but this pubescence is not evident except on close examination. *C. chiogenes* Small, and *C. nashii* Small have been used for some of the more extreme forms of this species.

Chamaesyce dioeca complex

Chamaesyce conferta Small and *C. pergamena* Small are very similar in overall appearance with curved glands, very unequal gland appendages, separate stipules with long acuminate tips and

very unequal leaf bases. Capsules are often not apparent on specimens, being hidden beneath the large pair of gland appendages; they are densely pubescent, with long appressed trichomes.

Chamaesyce conferta is an annual with reddish gland appendages. Compared to *C. pergamena*, it has shaggier pubescence and longer styles. Burch (1965) suggests that Florida populations should be considered conspecific with *C. dioeca*, but the Florida populations have much shorter styles than typical *C. dioeca*.

Chamaesyce pergamena (Small) Small is a perennial plant with a large rootstock. It is usually treated as either *Chamaesyce adenoptera* (Bertolini) Small or *C. adenoptera* (Bertolini) Small ssp. *pergamena* (Small) Burch, but the seed differences cited in Burch (1965) suggest that different species may be involved. I am retaining the name *C. pergamena* for the Florida plants pending a detailed comparison with West Indian specimens. It differs from *C. conferta* in having white gland appendages and shorter, more uniform pubescence.

Chamaesyce deltoidea (Engelmann ex Chapman) Small

A highly variable species with four strongly differentiated subspecies that have all been treated as separate species in the past. It is characterized by many wiry stems radiating from an enlarged woody rootstock, shallowly cordate leaf bases, and gland appendages very small to lacking. Subspecies *deltoidea* has glabrous or sparsely puberulent stems that are appressed to the substrate. Subspecies *adhaerens* has appressed to ascending stems with dense pubescence of irregularly twisted trichomes. Subspecies *pinetorum* has erect stems with a dense pubescence of spreading, straight trichomes. Subspecies *serpyllum* has appressed stems with a dense pubescence of irregularly twisted trichomes that are shorter than those found on subspecies *adhaerens*. A detailed treatment of this group is given in Herndon (1993).

Chamaesyce garberi complex

Chamaesyce garberi (Engelmann ex Chapman) Small, and *C. porteriana* Small have the erect, shrubby-branched growth habit of the *C. hyssopifolia* complex, but are distinguished by their cyathia solitary in leaf axils and thick leaves with entire margins.

Chamaesyce garberi as defined herein includes all populations of the complex with pubescent capsules. This includes *Chamae-*



syce brachypoda Small, *Chamaesyce mosieri* Small, *Chamaesyce keyensis* Small, and *Chamaesyce porteriana* var. *keyensis* (Small) Burch. There is variation within this complex that bears further study. In short, there appear to be three major groups with different pubescence patterns. These groups do not correspond to the species proposed by Small. Plants from the type locality at Cape Sable have long, spreading trichomes on the stem surfaces. The second densely pubescent group has strongly ascending to appressed, twisted trichomes. A final group is sparsely pubescent. In the extreme, the pubescence may be confined to the cyathia and capsules, suggesting a strong relationship with *C. porteriana*.

Small described *Chamaesyce keyensis* as a new species closely related to *C. porteriana* and Burch (1966) recognized the taxon as *C. porteriana* subspecies *keyensis*. An erect growth habit was primary reason for proposing these relationships. However, it escaped Small's notice that early collections of *C. garberi* from the type locality were sometimes erect. In fact, in both the *C. garberi* and *C. porteriana* groups, the basic growth habit of all plants seems to be erect. Often plants in both groups are found with a trailing growth, but these cases seem to be associated with litter that weights down the upper portions of the stems.

Chamaesyce porteriana Small is distinguished from *C. garberi* by its lack of pubescence. It superficially resembles large-leaved and sparingly branched, erect plants of *C. blodgettii*. See the discussion under the latter species for distinctions.

C. scoparia Small was recognized by Burch (1966) as *C. porteriana* var. *scoparia*. This name is applied to plants from the Lower Florida Keys that have narrow leaves and numerous, strictly ascending secondary branches. As currently defined, this presumptive variety grows sympatrically with plants that would be identified as *C. porteriana* var. *porteriana*, and cannot be upheld. There is a weak differentiation between mainland and keys populations of this species, and it is possible that all Keys populations should be recognized as var. *scoparia*. Small also recognized *C. adicioides* for highly branched plants with small leaves. I consider these to be no more than extremes of the natural variability in growth form of *C. porteriana*.

Chamaesyce hirta complex

Chamaesyce hirta (Linnaeus) Millspaugh and *C. ophthalmica* (Persoon) Burch are readily recognized by leaf shape and the

presence of two distinct trichome types on the stems. They also share very small, circular glands. The pedicels of the staminate flowers are exerted along the edges of the cyathium alternating with the glands and may be mistaken for gland appendages on superficial examination.

Chamaesyce hirta is the more robust plant with stems branching only at lower nodes, axillary inflorescences and small, but apparent, gland appendages.

Chamaesyce ophthalmica has smaller leaves than *C. hirta* in most cases, and dichotomous branches from the middle and upper nodes, and terminal inflorescences with no gland appendages. This species was called *C. gemella* (Lagasca) Small in most early floras.

Chamaesyce hyssopifolia complex

Chamaesyce hypericifolia (Linnaeus) Millspaugh, *C. hyssopifolia*, *C. lasiocarpa* and *C. nutans* (Lagasca) Small form a group with similar general appearance. Plants are annuals, usually erect, 30–70 cm tall, and shrubby-branched with spreading crowns. The leaves have conspicuously serrate margins and often have a cyanic spot near the center. In *C. hypericifolia* and *C. lasiocarpa*, the cyathia are clustered in essentially leafless axillary glomerules. In *C. hyssopifolia* and *C. nutans*, the cyathia are found in reduced, but recognizable, dichotomous branch systems. Glands are elliptic and small in all of these species. Gland appendages are usually larger than the glands and vary in color from white to pink (rarely red).

Chamaesyce hypericifolia was called *C. maculata* by Small (1933) and *Euphorbia glomifera* by Wheeler (1941). It is distinguished within the group by conspicuous, usually spreading, stipules that are much longer than wide.

Chamaesyce nutans may not occur in Florida. At the very least, Florida specimens referred to *C. hyssopifolia* and *C. nutans* are very closely related and probably not distinct. In particular, they both have a large, dark seed with 2–3 transverse ridges and one longitudinal ridge that give the seed a reticulate appearance. They also share a pattern of finely appressed puberulent stems and long, spreading trichomes on leaf surfaces. The capsule is glabrous in both regardless of pubescence on the stem. *Chamaesyce hyssopifolia* is often totally glabrous and at most has a small proportion



of stems pubescent near the tips. In *Chamaesyce nutans*, all stems are pubescent near the tips. This traditional distinction seems largely arbitrary, but is herein maintained pending a detailed study of the problem.

Chamaesyce lasiocarpa is densely puberulent in all parts. The pubescent capsule, in particular, distinguishes it within the complex. It is a recent introduction to Florida, apparently first collected in 1971.

Chamaesyce maculata complex

Chamaesyce humistrata (Englemann ex Gray) Small, *C. maculata* (Linnaeus) Small and *C. thymifolia* (Linnaeus) Millspaugh form a group apparently allied to the *C. dioeca* complex. They are characterized by long appressed trichomes on capsule, densely pubescent upper stem surfaces, glabrous lower stem surfaces, and separate stipules with long acuminate tips. All these species often have a large cyanic spot near the center of the leaf.

Chamaesyce maculata, called *Euphorbia supina* by Wheeler (1941), is distinctive within the group on account of the short styles that are conspicuously broadened near the tip. *Chamaesyce matthewsii* Small (Small 1933) is applied to plants of this species having internodes longer than the leaves. *Chamaesyce tracyi* is another name applied to some growth forms of these plants.

Chamaesyce humistrata is very similar to *C. maculata*, but more robust and with larger leaves, and longer, filliform styles. The formation of roots on the stems of *C. humistrata* is also distinctive.

Chamaesyce thymifolia is very similar to *C. maculata* in appearance, but has longer, filiform styles and more pointed leaves. In addition, the peduncle of the pistillate flower on this species is shorter than the involucre of the cyathium, so the capsule is not exerted. The involucre is ultimately flattened against the bottom of the capsule. The capsule is not fully exerted in all specimens of *C. maculata*, but the involucre is never crushed in these cases.

Chamaesyce polygonifolia complex

Chamaesyce bombensis (Jacquin) Dugand, *C. cordifolia* (Elliott) Small, *C. cumulicola* Small, and *C. polygonifolia* (Linnaeus) Small

form a group distinguished by their glabrous stems and lacerate stipules. *C. bombensis*, *C. cumulicola* and *C. polygonifolia* are further characterized by a rounded white seed.

Chamaesyce bombensis of this paper is often referred to *C. ammannioides* (H.B.K.) Small, but I believe the association between the former, earlier name and the species is correct. *C. bombensis* has also been treated as *C. ingallsii* Small. *C. bombensis* is the most common member of the complex in Florida and has a branching pattern usually resulting in plants with leaves and short stems concentrated near the distal quarter of the main stems. The cyathia are basically terminal, but often a single branch is produced below a cyathium so they appear to be axillary.

Chamaesyce cordifolia is distinguished within the complex in the more orbicular leaf shape, dense pubescence on the adaxial surface of the stipules and angled seeds.

Chamaesyce cumulicola has a diffuse branching pattern, and the cyathia appear to be axillary rather than terminal. In addition, the leaves are much narrower than those of the other species and have distinctive red margins. A fragmentary specimen from Escambia county was identified as this species by Burch, but the record needs confirmation before it can be accepted.

Chamaesyce polygonifolia, reaching its southern limits on the Northeast coast of Florida, has a distinctive appearance due to the obviously terminal position of the cyathia and the dichotomous appearance of the branching. In contrast to other species, glands are produced irregularly in the specimens of *C. polygonifolia* examined from Florida.

Chamaesyce prostrata complex

Chamaesyce mendezii (Boissier) Millspaugh and *Chamaesyce prostrata* (Aiton) Small share the peculiar pubescence pattern of spreading hairs concentrated on the angles of the capsule, densely pubescent upper stem surfaces, and glabrous lower stem surfaces. However, they differ greatly in seed surface sculpture, and may not be closely related. They are treated together here more as a matter of convenience than conviction.

Chamaesyce prostrata is characterized by small, dark green, orbicular leaves and red stems. Specimens are often mounted with the lower surface facing upward, so stem pubescence will appear



only along the sides of the stems. Called *Euphorbia chamaesyce* by Wheeler (1941).

Chamaesyce mendezii is lighter green and has larger leaves than *C. prostrata*. In addition, the stems of *C. mendezii* are evidently flattened, and there are two types of trichomes on the upper stem surface. Trichomes near the edges of the upper surface are long and spread out to the sides of the stems while trichomes in the middle of the upper surface are shorter and often appressed. This species is a recent introduction to Florida with the first known collection in 1954 (Burch 1965).

Chamaesyce mesembryanthemifolia (Jacquin) Dugand

A shrubby habit, fleshy leaves and conspicuous ligules are diagnostic for this species. Leaves are ascending and overlapping on the branches. This species is referred to *C. buxifolia* (Lamarck) Small by most earlier authors.

Chamaesyce serpens

(Kunth in Humbolt, Bonpland & Kunth) Small

Rooting stems, the small but conspicuous white ligule and the elongated, white perianth lobes are distinctive on this species. The leaf shape and habit of *C. serpens* are similar to *C. prostrata* and some specimens of *C. blodgettii*, but no other Florida species seem to be closely related.

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