

403. ASTERACEAE (Aster Family) [in ASTERALES]

Note *Chaptalia*,
Stokesia & *Berlandiera*
are not yet keyed &
may be others.

A family of about 1500-1700 genera and 20,000-25,000 species, shrubs, herbs, trees, and vines, cosmopolitan in distribution.
References: SE.

Identification Notes: {define liguliflorous, discoid, disciform, radiant, and radiate heads; define various pappus characters. define calyculus. define palea and phyllary}

- 1 Plant a shrub or liana (woody vine), definitely with woody growth well above ground level **Key A**
- 1 Plant an annual, biennial, or perennial, lacking woody growth above ground level.
- 2 Leaves opposite or whorled, at least on the lower stem nodes (the leaves higher on the stem sometimes alternate).
- 3 Heads discoid or disciform **Key B**
- 3 Heads radiate **Key C**
- 2 Leaves either alternate (not opposite even at lower nodes of the stem) or basal only (the heads on scapiform stems).
- 4 Heads liguliflorous (composed of ligulate florets); sap usually milky **Key D**
- 4 Heads discoid, disciform, radiant, or radiate; sap usually clear.
- 5 Heads discoid, disciform, or radiant **This lead applies to key FOV (~F) too.** **Key E**
- 5 Heads radiate **Key G**

Key A - woody composites (shrubs and lianas)

- 1 Leaves strictly alternate; [tribe *Astereae*].
- 2 Heads discoid; dioecious shrubs to 5 m tall; [widespread in our area] **Baccharis**
- 2 Heads radiate (most or all on a plant); bisexual shrub to 1 m tall or scrambling liana; [of se. NC southward, native in the Coastal Plain only].
- 3 Leaves with clasping base, with a midvein and lateral veins and tertiary reticulation; rays pink or rose; sprawling viny shrub to 4 m tall; [of wet habitats of SC (or se. NC) southward, also cultivated] **Ampelaster**
- 3 Leaves with a cuneate base, with a midvein and otherwise minutely pebbled; rays yellow; intricately branched shrub to 1 m tall, with persistent sterile shoots with evergreen leaves and annual flowering shoots (the entire shoot and leaves deciduous); [of xeric sandy barrens, of se. NC southward] **Chrysoma**
- 1 Leaves opposite, at least on the lower stem nodes (the leaves higher on the stem sometimes alternate); [tribe *Heliantheae*].
- 4 Heads radiate, ray florets yellow; disc florets yellow; leaves strictly opposite or in part alternate.
- **Borrichia**
- 4 Heads discoid or disciform, ray florets lacking; disc florets pink, purple, or whitish; leaves opposite, but usually at least in part alternate higher on the stem; [collectively of various habitats, Coastal Plain and inland].
- 5 Heads solitary, axillary in the axils of leaves or leafy bracts; heads nodding, the involucre 2-7 mm high; [collectively widespread in our area, of maritime and inland wetlands or moist disturbed areas]; [tribe *Heliantheae*; subtribe *Ambrosiinae*] **Iva**
- 5 Heads many, terminal on the branches of corymbiform arrays; heads erect, the involucre 4-12 mm high; [of Coastal Plain of FL, s. GA, s. AL, and c. MS, of dry, sandy scrub and pinelands, blackland prairies, or dry, disturbed areas].
- **Palafoxia**

Key B - herbaceous composites with opposite or whorled leaves and discoid or disciform heads (lacking ray florets)

- 1 Pappus present, of 5-60 barbellate bristles; receptacle naked (without paleae or well-developed bristles); [tribe *Heliantheae*; subtribe *Eupatorieae*].
- 2 Plant a twining herb, phyllaries and disk florets 4 per head **Mikania**
- 2 Plant stiffly erect to weakly spreading but never twining, phyllaries and disk florets usually > 4 per head.
- 3 Leaves in whorls of 3-7, > 2 cm wide **Eutrochium**
- 3 Leaves opposite, rarely alternate or whorled, if whorled, < 2 cm wide.
- 4 Achenes (and ovaries) 8-10-ribbed; outer phyllaries longitudinally striate **Brickellia**
- 4 Achenes (and ovaries) (3-) 4-5-ribbed; outer phyllaries not noticeably longitudinally striate.
- 5 Heads pink to blue.
- 6 Heads pink (rarely bluish); receptacles flat; florets 18-25 per head **Fleischmannia**
- 6 Heads blue; receptacles conic; florets 25-70 per head.
- **Conoclinium**
- 5 Heads white to cream or, rarely, pale lilac.
- 7 Florets 3-7 per head **Eupatorium**
- 7 Florets at least 9 per head.
- 8 Phyllaries not strongly imbricate, with the principal ones subequal and sub-biseriate; petioles 0.5-10 cm **Ageratina**
- 8 Phyllaries clearly imbricate, in 3+ series; some species epetiolate **Eupatorium**
- 1 Pappus absent, or of scales, setae, or awns; receptacle either naked, or with paleae or well-developed bristles
- 9 Leaves whorled, linear, < 2 mm wide; head solitary; [aquatic herb growing in shallow stagnant water] **Sclerolepis**
- 9 Leaves opposite (or alternate in part), broader in shape and > 5 mm wide; heads typically not solitary; [terrestrial or wetland plants].
- 10 Receptacle naked.

- 11 Pappus of 4-10 scales; heads white, pink, or blue.
 12 Heads with 20-125 florets; leaves serrate; [rarely naturalized aliens in our area] *Ageratum*
 12 Heads with 10-30 florets; leaves entire; [natives, of FL, s. GA, and MS in our area] *Palafoxia*
 11 Pappus none, or of a few bristles or irregular coroniform lobes; heads green to yellow.
 13 Heads bright yellow, closely aggregated into corymbiform arrays of flat-topped to dome-shaped glomerules *Flaveria*
 13 Heads greenish or greenish yellow, borne in spiciform, racemiform, or panicleform arrays.
 *Iva*
 10 Receptacle with paleae or well-developed bristles.
 14 Heads small, less than 1 cm in diameter at anthesis (the female heads enlarging in *Xanthium*); disc florets dull white or suffused with green or purple; florets mainly unisexual (either in the same heads and then males central and females peripheral, or in separate female and male heads); female florets 0-8 per head; [tribe *Heliantheae*; subtribe *Ambrosiinae*]
 15 Heads unisexual; cypselas shed within an indurated bur or "nut" with hooked or straight spines developed from the phyllaries and/or paleae. "achenes" hard
 16 Involucre of the female heads with tubercles or straight spines developing from the phyllaries; burs 1-8 mm long. ragweed
 *Ambrosia*
 16 Involucre of the female heads with hooked spines developing from the phyllaries/paleae; burs 10-35 mm long *Xanthium*
 15 Heads bisexual, with functionally male and female flowers in the same head; cypselas shed individually, not enclosed. cocklebur
 *Iva*
 14 Heads larger, mostly > 1 cm in diameter at anthesis; disc florets conspicuously white, yellow, pale yellow, or purple; florets mainly bisexual; female florets > 12 per head (except 2-8 in *Polymnia*).
 17 Disc flowers maroon-purple; leaves mainly basal *Helianthus radula*
 17 Disc flowers white, pale yellow, or bright yellow; leaves mainly or strictly cauline. rayless sunflower
 18 Disc flowers bright yellow.
 19 Involucre of phyllaries not subtended by a calyculus *Acmella*
 19 Involucre of phyllaries subtended by a calyculus of bracts obviously different in color, texture, and shape than the phyllaries *Bidens*
 18 Disc flowers bright white or pale yellow.
 20 Disc flowers bright white; leaves unlobed or with 2 basal lobes *Melanthera*
 20 Disc flowers creamy or pale yellow; leaves prominently pinnately lobed, with 5-many lobes *Polymnia*

Key C - herbaceous composites with opposite leaves and radiate heads

double keying

- 1 Involucre of phyllaries subtended by a calyculus of bracts obviously different in color, texture, and shape than the phyllaries; [tribe *Heliantheae*; subtribe *Coreopsidinae*].
 2 Cypselas beaked, not strongly flattened, 7-30 mm long, with 1 groove per face; leaves highly dissected *Cosmos*
 2 Cypselas beakless, more or less strongly flattened and also often winged, 1.2-16 mm long, with 0 or 2 grooves per face; leaves simple to highly dissected.
 3 Cypselas 2.5-16 mm long, usually not winged; pappus awns (if present) usually retrorsely barbed *Bidens*
 3 Cypselas 1.2-8 mm long, usually winged; pappus awns (if present) barbellate or antorsely barbed *Coreopsis*
 1 Involucre of phyllaries not subtended by a calyculus (or subtended by a calyculus of narrowly linear segments bearing oil glands in *Dyssodia* and *Thymophylla*).
 4 Ray florets white, pink, or purple (rarely pale yellow or lavender).
 5 Ray flower persistent on the achene and becoming papery and bleached. *Zinnia*
 5 Ray flower articulate from the achene and falling.
 6 Pappus of a minute crown; disk florets white or whitish *Eclipta*
 6 Pappus either lacking, or of numerous scales, or of retrorsely barbed awns; disk florets yellow.
 7 Annual of disturbed habitats; leaves usually < 1 dm long; phyllaries < 5 mm long *Galinsoga*
 7 Perennial of native habitats; leaves > 1 dm long; phyllaries > 6 mm long *Polymnia*
 4 Rays predominantly yellow, orange, or red (sometimes with some brown, maroon, or purple coloration as well).
 8 Receptacle naked, epaleate.
 9 Leaves and phyllaries with large, scattered, embedded oil glands, translucent in living plants, usually golden-brown or blackish in herbarium specimens, making the plants strongly aromatic; annual plants, decumbent and much branched from the base (except *Tagetes*, annual and generally erect and sparingly branched); [tribe *Heliantheae*; subtribe *Pectidinae*].
 10 Leaves unlobed, entire (though with marginal setae) *Pectis*
 10 Leaves pinnately lobed, the margins also often serrate. *Tagetes*
 9 Leaves and phyllaries lacking embedded oil glands, though smaller punctate glands sometimes present; perennial or annual plants, upright and little or moderately branched below the inflorescence.
 11 Phyllaries 6 (-9), in 1 series; disc florets 1-15 *Flaveria*
 11 Phyllaries 12-26, in 2-3 series; disc florets 20-150.
 12 Phyllaries 12-18; rays usually 8-16; leaves mainly basal or basally disposed (a few pairs low on the stem); [on various, usually acid substrates, in the Coastal Plain and Piedmont from NJ and PA south to n. and Panhandle FL] *Arnica*
 12 Phyllaries broadly ovate, squarrose, in several imbricate series; rays usually 8; leaves cauline; [on calcareous substrates in n. ATL] *Jamesianthus alabamensis*
 8 Receptacle paleate, with paleae, bristles, or scales.
 13 Disk florets functionally staminate ("sterile", not producing cypselas), the style undivided, their ovaries much smaller than those of the ray flowers (which are functionally pistillate).
 14 Inner phyllaries prickly with straight or uncinat prickles, and each enveloping a cypselas and swelling into a bur-like structure ...
 *Acanthospermum*

- 14 Inner phyllaries unarmed, not becoming bur-like (though those of *Melampodium* do invest the fruit).
 15 Slender, small plants, the stems to 5 dm long, often trailing; pappus persistent, forming a crown *Chrysogonum*
 15 Taller, robust plants, the stems usually 5-40 cm long at maturity, erect; pappus absent or of 2 awns.
 16 Cypselas strongly flattened, borne in 2-3 series from the 2-3 series of ray florets *Silphium*
 16 Cypselas thick, not flattened, borne in 1 series from the 1 series of ray florets *Smallanthus*
 13 Disk florets functionally bisexual ("fertile", producing cypselas), the style divided, their ovaries as large as, or larger than, those of the ray florets (which may be either functionally pistillate or completely neuter).
 17 Ray corolla persistent on the achene and becoming papery and bleached.
 18 Plant a perennial; cypselas subterete, 4-5 mm long *Heliopsis*
 18 Plant an annual; cypselas 3-angled or flattened, 6-10 mm long *Zinnia*
 17 Ray corolla articulate from the achene and falling after flowering.
 19 Paleae flattened, not notably clasping the cypselas; cypselas usually notably flattened in the same plane as the phyllaries and the paleae, i.e. at a right angle to the radii of the head; heads small, the receptacle 3-8 mm in diameter.
 *Calypocarpus vialis*
 19 Paleae conduplicate (V-shaped in cross section), the 2 sides of the V partially clasping the cypselas; cypselas either subterete, multi-angled in \times -section, or flattened parallel to the radii of the head; heads mostly larger.
 20 Phyllaries apparently 4 (the 4 outer foliaceous phyllaries forming a quadrangle which hides the much smaller and narrower inner phyllaries) *Tetragonotheca*
 20 Phyllaries not as above (5 or more phyllaries readily visible).
 21 Cypselas (of at least the disk florets) strongly flattened and generally also winged.
 22 Cypselas 1-2.5 mm long; herb to 2 dm tall (erect or creeping) *Acmella*
 22 Cypselas 3-7 mm long; herb to 1-40 dm tall (erect) *Verbesina*
 21 Cypselas subterete, quadrangular, variously angled, or diamond-shaped in \times -section, not winged.
 23 Ray florets pistillate ("fertile").
 *Pascalina glauca*
 23 Ray florets completely neuter.
 *Helianthus*

**Key D - herbaceous composites with leaves alternate or basal,
liguliflorous heads (composed of ligulate florets), and sap usually milky**

- 1 Cypselas (at least of the inner florets of the head) beaked.
 2 Heads solitary and terminal at the end of a stem unbranched to its base.
 3 Leaves basal and cauline, grasslike (untoothed and unlobed); stem leafy *Tragopogon*
 3 Leaves basal only, variously toothed to pinnately lobed; stem scapiform (leafless).
 4 Pappus of bristles *Taraxacum*
 4 Pappus either of outer scales and inner bristles or entirely of aristate scales.
 *Leontodon*
 2 Heads several per stem, in various corymbiform, umbrelliform, spiciform, or paniculiform arrays (rarely solitary and terminal in the smallest and most depauperate individuals in a population).
 5 Achenes distinctly flattened *Lactuca*
 5 Achenes terete or prismatic.
 6 Pappus of plumose bristles, at least the inner series; plant an annual or biennial.
 *Hypochaeris*
 6 Pappus of simple capillary bristles; plant an annual, biennial, or perennial.
 7 Beak of the cypselas with a ring of soft white reflexed hairs at the summit (just below the pappus) *Pyrrophappus*
 7 Beak of the cypselas lacking a ring of hairs as described.
 8 Pappus of 80-150 barbellulate bristles; plant an annual or biennial *Crepis*
 8 Pappus either of 40-50 (or more) smooth bristles or of 20-30 barbellulate bristles; plant a perennial
 *Chondrilla*
 1 Cypselas beakless.
 9 Leaves basally disposed (stem leaves few or none, if present generally smaller in size than the basal leaves, which are persistent into flowering and fruiting); corollas yellow, orange, or red.
 10 Pappus absent or of both scales and barbellulate bristles *Krigia*
 10 Pappus of bristles only (these barbellulate or plumose). minimum 10X mag. See slide 6.
 11 Leaves with entire margins; plants perennials, either from long to short rhizomes or from a short caudex with fibrous roots
 *Hieracium*
 11 Leaves coarsely toothed or pinnately lobed; plants annuals, from a taproot.
 12 Involucre 5-12 mm high; achenes usually > 2.5 mm long; pappus bristles distinct, 3-7 mm long *Crepis*
 12 Involucre 3-5 mm high; achenes 1.5-2.5 mm long; pappus bristles basally connate, 2.5-3.5 mm long *Youngia*
 9 Leaves basal and cauline (plant often beginning with a basal rosette, but by flowering bearing well-developed stem leaves about as large as the basal leaves, the basal rosette often withering prior to flowering and fruiting); corollas yellow, orange, red, blue, pink, white, or lavender.
 13 Pappus absent or of scales.
 14 Corollas pale blue (rarely pink or white) *Cichorium*
 14 Corollas yellow (rarely orange).
 15 Cypselas 1.2-2.8 mm long; heads borne single at the ends of scapiform stems that are unbranched (rarely few-branched near the base); plants to 7 dm tall *Krigia*
 15 Cypselas 3-5 mm long; heads borne in corymbiform or thyriform arrays; plants to 15 dm tall *Lapsana*

- 13 Pappus of numerous smooth, barbellate, or plumose bristles.
 16 Cypselas more or less strongly flattened. *Sonchus*
- 16 Cypselas terete or prismatic slightly or not at all flattened.
 17 Corollas pink, purple, lavender, white, or creamy-yellow.
 18 Leaves linear, entire, < 3 mm wide, or reduced to scales; cypselas 11-14 mm long; [of the Coastal Plain of GA and se. AL south to s. FL] *Lygodesmia*
 18 Leaves broader, of various shapes, usually hastate, irregularly lobed, and/or serrate; cypselas 3.5-10 mm long; [collectively widespread in our area, south to n. FL] *Nabalus*
- 17 Corollas bright yellow, orange, or red.
 19 Plants taprooted annuals and biennials (rarely perennials); pappus bristles white and soft in texture *Crepis*
 19 Plants fibrous-rooted perennials; pappus bristles white, light to medium tan, or sordid, stiff.
 20 Cypselas (2-) 2.5-7 mm long; pappus of (30-) 40-80 white, tan, or sordid bristles, in 1-2+ series; plants caespitose; corollas yellow *Hieracium*
 20 Cypselas 1-2.5 mm long; pappus of 25-40+ white to sordid bristles, in 1 series; plants stoloniferous (caespitose in a few species); corollas yellow or orange *Pilosella*

Key E - . Herbaceous composites with leaves spiny, leaves alternate or basal, and heads discoid

- 1 Stem winged, the wings armed with spines. *Carduus*
- 1 Stem not winged.
 2 Disk flowers pink (rarely white) *Cirsium*
 2 Disk flowers yellow.
 3 Pappus of numerous plumose bristles *Cirsium*
 3 Pappus absent or of scales or barbellulate bristles. *Centaurea benedicta*
- Yellow flws.**

Key from FOV - for editing and augmentation:

- Flora of Virginia** **Ask me where is the "real" F?**
- 1 Receptacles with paleae or bristles.
 2 Pappus lacking or of scales or awns.
 3 Pappus lacking.
 4 Involucre of dentate or fimbriate phyllaries *Centaurea*
 4 Involucre of the pistillate heads a bur with hooked prickles *Xanthium*
 3 Pappus present.
 5 Phyllaries dentate or fimbriate *Centaurea*
 5 Phyllaries entire *Marshallia*
- 2 Pappus of bristles.
 6 Phyllaries fimbriate, dentate, or spiny; leaves often prickly or spiny *Centaurea*
 6 Phyllaries entire, leaves not prickly or spiny.
 7 Phyllaries hooked at tip; heads forming burs at maturity *Arctium*
 7 Phyllaries not hooked at tip; heads not forming burs at maturity.
 8 Heads larger, the involucre 6-15 mm high, with 15-40 phyllaries; leaves with conspicuous (at least at 10× magnification) resin dots *Carphephorus*
 8 Heads small, the involucre 3.5-6 mm high, with 5-12 phyllaries; leaves without shining punctate glands (except punctate-glandular in *Litrisa*, of the FL peninsula). *Trilisa*
- Weakley does not say or use radiant head probably because it is a special type of discoid head, but it applies to *Marshallia* & some spp. of *Centaurea*.**
- 1 Receptacles naked.
 9 Pappus lacking or of scales or awns.
 10 Disk florets blue or purple.
 11 Heads few-flowered, aggregated into secondary heads with leafy bracts *Elephantopus*
 11 Heads many-flowered, not aggregated into secondary heads *Vernonia*
 10 Disk florets yellow to yellowish green or reddish to reddish brown.
 12 Cypselas winged and spined; heads sessile in the branch forks *Soliva*
 12 Cypselas not winged and spined; heads not sessile in the branch forks. *Artemisia*
- 9 Pappus of capillary bristles.
 13 Heads yellow.
 14 Perennial; leaves remotely toothed to entire; [of shale barrens] *Packera*
 14 Annual; leaves irregularly toothed to pinnatifid; [weed of disturbed soil] *Senecio*
- 13 Heads white, whitish, pink, purple, red,
 15 Florets all perfect. **arrow-head shaped, basal lobes turned outward**
 16 Larger leaves hastate; heads whitish *Senecio*
 16 Leaves not hastate; heads whitish to red or pink to violet or deep purple.
 17 Phyllaries in essentially one series; leaves palmately veined, ovate to reniform *Arnoglossum*
 17 Phyllaries in several series; leaves variously veined, linear to broadly ovate.
 18 Heads white or whitish; [of uplands] *Brickellia*

- 18 Heads pink to red or violet to deep purple or, rarely, white; [of uplands or wetlands].
 19 Pappus bristles of one length *Liatris*
 19 Pappus double with inner bristles long and the outer very short *Vernonia*
- 15 Some or all florets pistillate.
 20 Leaves not white-woolly.
 21 Phyllaries in essentially one series; fresh plants not strongly scented *Erechtites*
 21 Phyllaries in several series; fresh plants with a strong, aromatic fragrance *Pluchea*
- 20 Leaves white woolly, at least beneath.
 22 Plants dioecious.
 *Antennaria*
- 22 Plants not dioecious.
 23 Blooming Mar-Jul; pappus bristles united at base *Gamochaeta*
 23 Blooming mostly Jul-Nov; pappus bristles distinct.
 *Pseudognaphalium*

use of P in
HIPDAD

Key G - Herbaceous composites with the leaves alternate or basal and the heads radiate

- 1 Ray florets yellow to orange.
 2 Receptacles chaffy.
 3 Disk florets sterile with style undivided *Silphium*
 3 Disk florets fertile with style bifurcate.
 4 Leaves decurrent down the stem; cypselas strongly flattened and often winged *Verbesina*
 4 Leaves not decurrent; cypselas moderately compressed, not winged.
 5 Receptacles flat *Helianthus*
 5 Receptacles conical or columnar *Rudbeckia*
- 2 Receptacles naked, rarely with bristles.
 6 Pappus of scales or a crown.
 *Helenium*
- 6 Pappus of bristles, sometimes also with shorter outer scales.
 7 Phyllaries in one series.
 *Packera*
- 7 Phyllary in 2+ series.
 8 Pappus double.
 9 Ray florets without pappus *Heterotheca*
 9 Ray florets with pappus (similar to that of disk florets).
 10 Leaves pinnately veined, usually broader and not grasslike *Chrysopsis*
 10 Leaves parallel-veined, linear and grasslike *Pityopsis*
- 8 Pappus simple.
 11 Plants taprooted [of dry Coastal Plain sands from se. VA southwards] ... *Pappus tan or brown.* *Croptilon*
 11 Plants not taprooted [widespread].
 12 Inflorescences flat-topped corymbs; leaves resinous-punctate, narrow, entire, sessile or subsessile *Euthamia*
 12 Inflorescences rarely flat-topped; leaves not resinous-punctate, usually not linear, often toothed and petiolate *Solidago*
- 1 Ray florets white or whitish to pink or purple.
 13 Receptacles chaffy.
 14 Phyllaries dry, scarious-margined.
 15 Ray florets 1–5 mm long; heads small in corymbiform arrays *Achillea*
 15 Ray florets > 5 mm long; heads large, terminating the branches *Anthemis*
- 14 Phyllaries herbaceous, not scarious on margins.
 16 Ray florets < 2.5 mm long; disk florets sterile, with an undivided style *Parthenium*
 16 Ray florets > 5 mm long; disk florets fertile, with a divided style.
 17 Ray florets pink or light purple, > 15 mm long; heads single *Echinacea*
 17 Ray florets white, 5–10 mm long; heads 20–100 in a compound corymb. *See Fig. 311 in H & Harr.* *Verbesina*
- 13 Receptacles naked.
 18 Pappus lacking.
 *includes some Chrysanthemums - mums - ox eye daisy* *Leucanthemum*
- 18 Pappus present.
 19 Taprooted annuals; ray florets 1–7 mm long.
 20 Leaves and stems not fleshy, rarely glabrous; cypselas < 1.4 mm long *Conyza*
 20 Leaves and stems fleshy, mostly glabrous; cypselas > 1.4 mm long *Symphotrichum*
- 19 Not taprooted and mostly perennials; ray florets > 3 mm long.
 21 Ray florets usually > 60; blooming Apr-Oct *Erigeron*
 21 Ray florets rarely > 60; blooming late May-Nov.
 22 Receptacles hemispheric to conic; pappus often with 2–4 awns *False Aster - has awns on pappus, not capillary bristles.* *Boltonia*
 22 Receptacles flat to slightly convex; pappus lacking awns.
 23 At least the basal and lower leaves both petiolate and cordate/subcordate at base.
 24 Often colonial; inflorescence corymbiform, flat-topped or rounded; outer phyllaries > 1 mm broad *Eurybia*
 24 Not colonial; inflorescence paniculiform, often elongate; outer phyllaries < 1 mm broad *Symphotrichum*
 23 Basal and lower leaves not both petiolate and cordate/subcordate at base.

- 25 Leaves sessile and auriculate or cordate-clasping *Symphyotrichum*
 25 Leaves petiolate or epetiolate but not auriculate or cordate-clasping.
 26 Cypselas glandular; pappus double *Oclemena*
 26 Cypselas not glandular; pappus single or double or in four series.
 27 Leaves silvery-silky on both sides (at least when young), entire *Symphyotrichum*
 27 Leaves not silvery-silky, entire or toothed.
 28 **Pappus double** with inner bristles distinctly longer than outer bristles.
 29 Leaves not rigid, veiny, lanceolate to elliptic or ovate, > 6 mm wide *Doellingeria*
 29 Leaves rigid, 1-nerved, linear to linear-spatulate, < 5 mm wide *Ionactis*
 28 **Pappus simple** with all bristles often about the same length.
 30 Ray florets white, few (usually 3–8); cypselas densely silky *Sericocarpus*
 30 Ray florets white to pink or blue or purple, more numerous (usually 8–30); cypselas glabrous to pubescent but not densely silky.
 31 Ray florets white; involucre < 6 mm long; phyllaries < 1 mm wide *Symphyotrichum*
 31 Ray florets white or pink to blue or purple; involucre 7–12 mm long; phyllaries usually > 1 mm wide.
 32 Phyllaries glandular *Eurybia*
 32 Phyllaries not glandular.
 33 Phyllaries long-attenuate or loose and spreading *Symphyotrichum*
 33 Phyllaries appressed, not long-attenuate.
 34 Plants coarse-hairy; lowest leaves > 5 cm wide *Aster*
 34 Plants glabrous to hairy; lowest leaves < 3 cm wide *Eurybia*

The exotic *Aster tataricus* (Tartarian aster) is rare in NW GA.

Acanthospermum Schrank 1820 (Paraguay Bur)

A genus of about 6 species, herbs, of tropical America. References: SE; Strother in FNA21 (2006c).

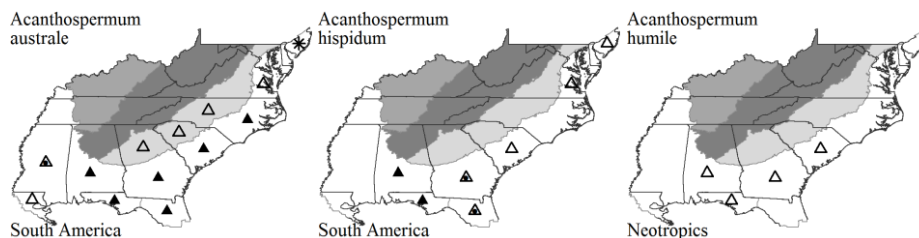
The "cloud" has the Asters of "old."

- 1 Stems prostrate and rooting at the nodes; bur 7-9 mm long, slightly compressed, strongly 5-7-ribbed *Acanthospermum australe*
 1 Stems erect; bur 2-6 mm long, obviously compressed, obscurely ribbed or 3-ribbed.
 2 Leaves (2-) 4-12 (-15) cm long, sessile or subsessile; bur with prickles on all surface *Acanthospermum hispidum*
 2 Leaves 1-3 (-4.5) cm long, petiolate, the petiole 4-18 mm long; bur unarmed or nearly so on the side faces, the prickles along the ribs and around the tip *Acanthospermum humile*

* *Acanthospermum australe* (Loefling) Kuntze, Paraguay Bur, Sheep Bur. Disturbed areas; native of South America. May-Nov. [= C, F, FNA9, G, K, RAB, S, SE, Va, WH3]

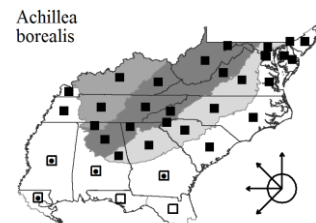
* *Acanthospermum hispidum* A.P. de Candolle, Hispid Starbur. Disturbed areas, soybean and peanut fields, gardens; native of n. South America. Jul-Nov. First reported from SC by Hill & Horn (1997). [= FNA9, K, S, SE, WH3]

* *Acanthospermum humile* (Swartz) A.P. de Candolle, Low Starbur. Disturbed areas; native of the West Indies. Reported for SC by Nelson (2003). [= FNA9, K, S, SE, WH3; = *Melampodium humile*]



Achillea Linnaeus 1753 (Yarrow, Milfoil, Thousand-leaf)

A genus of about 115 species, herbs, primarily Eurasian. References: Arriagada, J.E. & N.G. Miller (1997); SE; Guo, Y.-P., F. Ehrendorfer, & R. Samuel (2004); Guo, Y.-P. et al. (2005); Ramsey, J., A. Robertson, & B. Husband (2008); Trock in FNA19 (2006a).



Achillea borealis Bongard, American Yarrow, American Thousandleaf. Grassy balds, meadows, pastures, roadsides, disturbed areas. Apr-Nov. Widespread in North America. The *Achillea millefolium* aggregate is a taxonomically very complex entity, with races of different ploidies, and both introduced and native genotypes in e. North America. Ramsey, Robertson & Husband (2008) have recommended treating native North American races as *A. borealis*; most eastern North American populations represent native North American races, most closely allied to e. Asian taxa, with only a few collections of European races from near old port cities (Ramsey, pers. comm.; Ramsey 2011; Levin 2011). [= Ramsey, J., A. Robertson, & B. Husband (2008); = *Achillea lanulosa* – Arriagada, J.E. & N.G. Miller (1997), F; = *Achillea millefolium* ssp. *lanulosa* – C, G, W;