

GOLDEN HILLS RC&D presents
NATIVE ASTER IDENTIFICATION



Online class via Zoom
Monday, January 11
7:00-8:00pm

Learn how to identify common flowers in the genus
Symphyotrichum with Dr. Tom Rosburg

Pre-registration required. \$5 registration fee. Learn more and sign up at
goldenhillsrcd.org/plantID

Open to the public. Project made possible through a grant from
Gilchrist Foundation



Photo credits:

Dr. Thomas Rosburg (border lines)

Minnesota Wildflowers -- <https://www.minnesotawildflowers.info/>

Missouri Plants -- <http://www.missouriplants.com/>

Michigan Flora Online -- <https://michiganflora.net/home.aspx>

Overview of Asteraceae Capitula

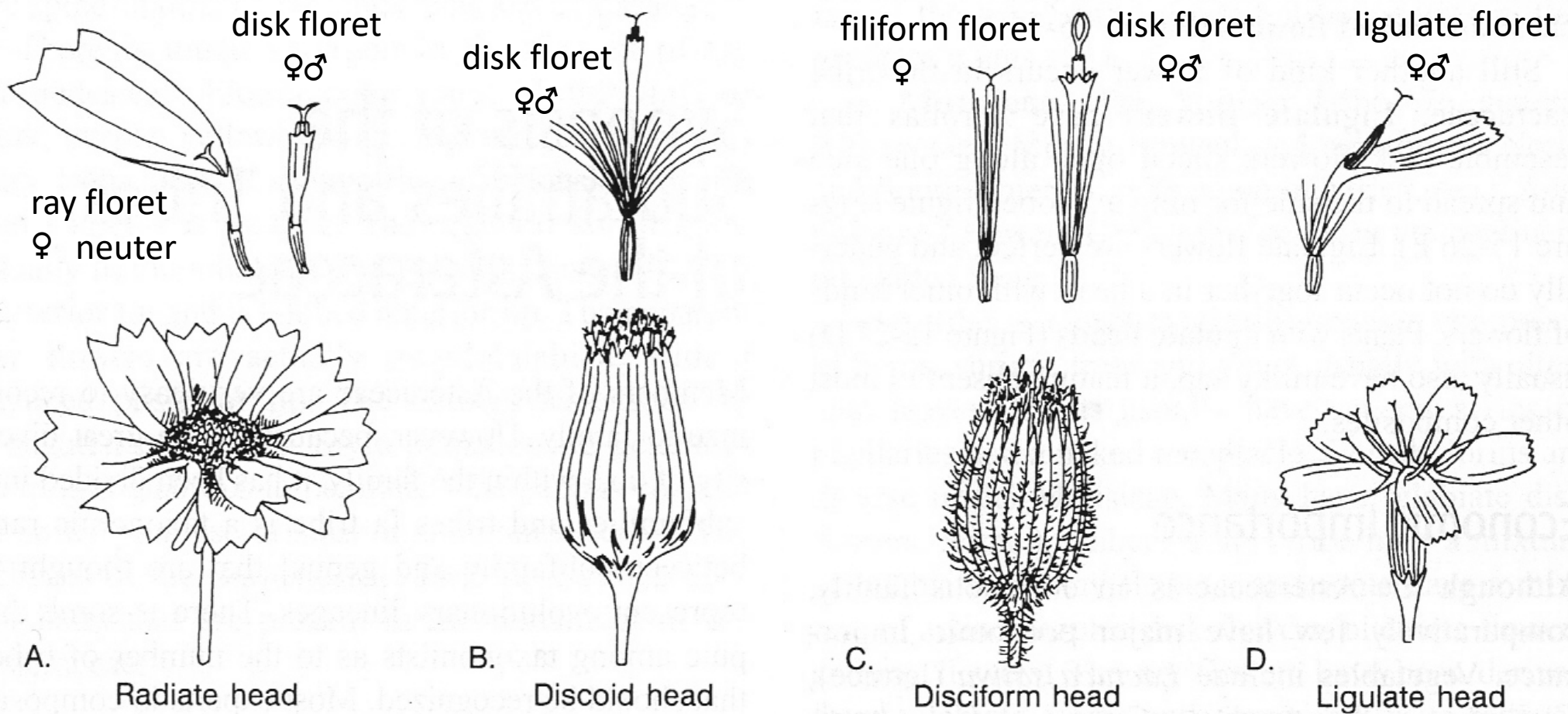


Figure 15-27 Types of heads and the flowers that they contain. A. Radiate head with ray and disk flowers. B. Discoid head with only disk flowers. C. Disciform heads with filiform flowers and disk flowers. D. Ligulate head with only ligulate flowers.

Overview of Asteraceae Involucres

single involucral bract = phyllary
 involucre = all the phyllaries

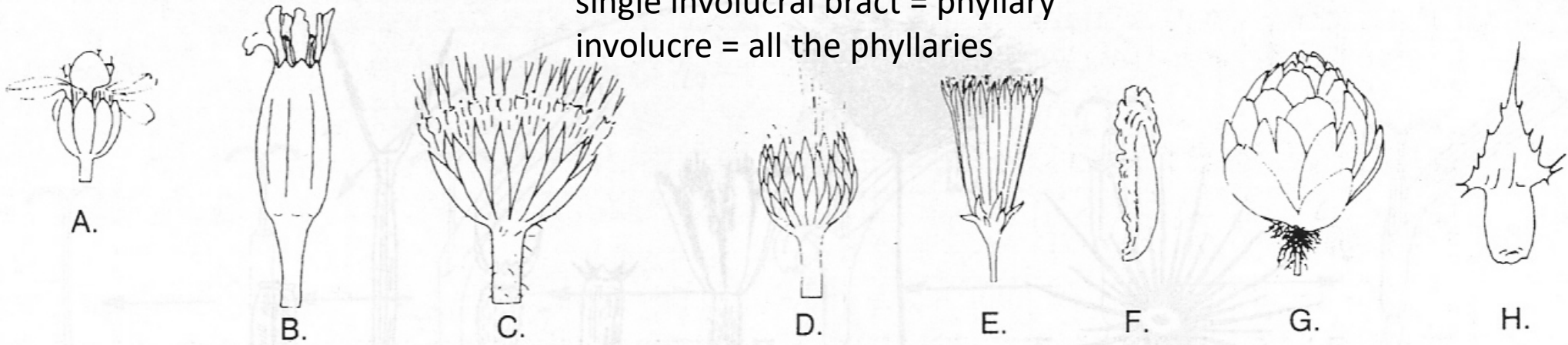


Figure 15-23 Variation in the involucre. A. Uniseriate involucre of distinct phyllaries. B. Uniseriate involucre of connate phyllaries. C. Involucre of 2 series of subequal phyllaries. D. Involucre of strongly imbricated phyllaries in several unequal series. E. Involucre with principal phyllaries in one series and smaller bractlets (calyculum) at base. F. Individual phyllary with scarious margin. G. Involucre of imbricated phyllaries that are wholly scarious. H. Individual phyllary with fringed, spine-tipped terminal appendage.



Symphyotrichum anomalum
<http://www.missouriplants.com/>



Lactuca floridana
<http://www.missouriplants.com/>



Solidago missouriensis
http://www.botany.hawaii.edu/faculty/carr/images/sol_mis.jpg

Overview of Asteraceae Pappi

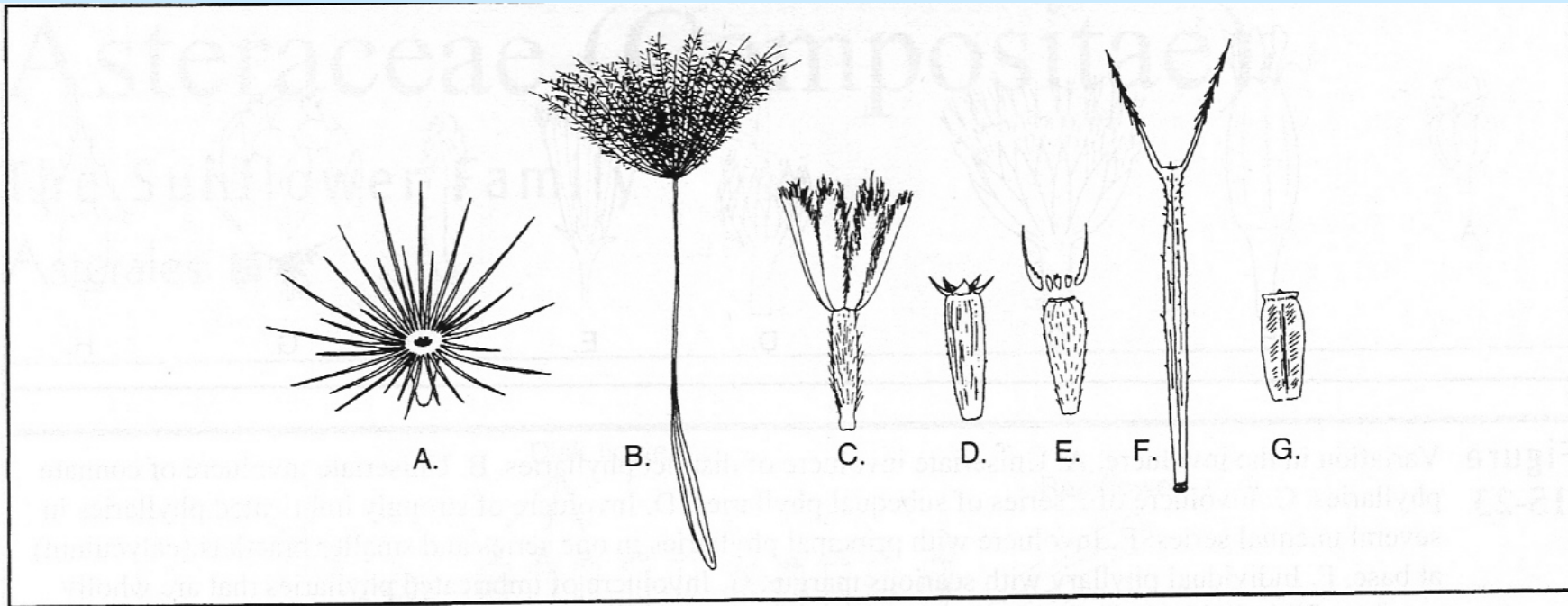


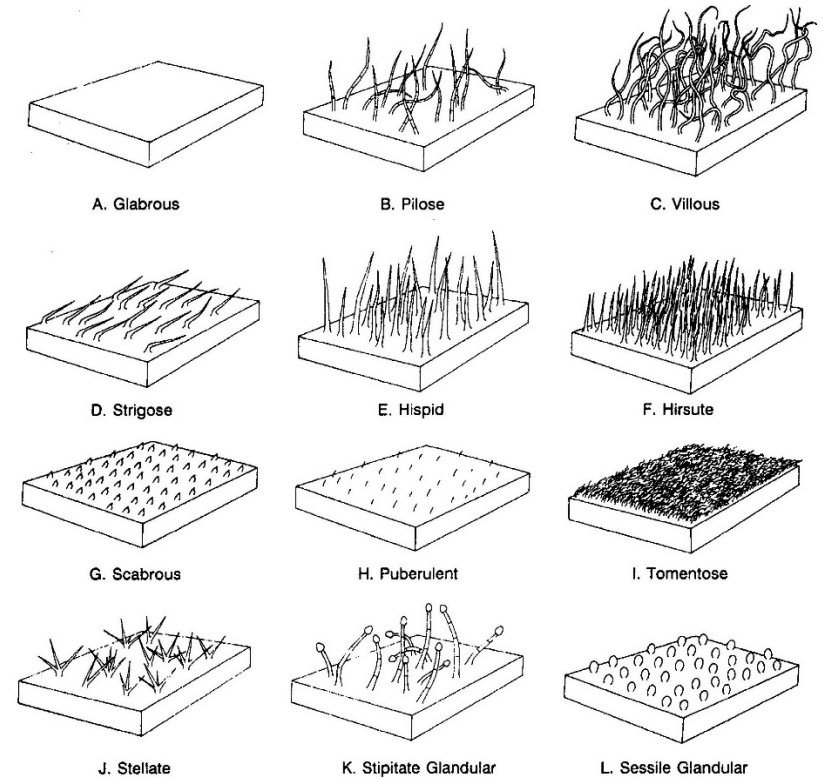
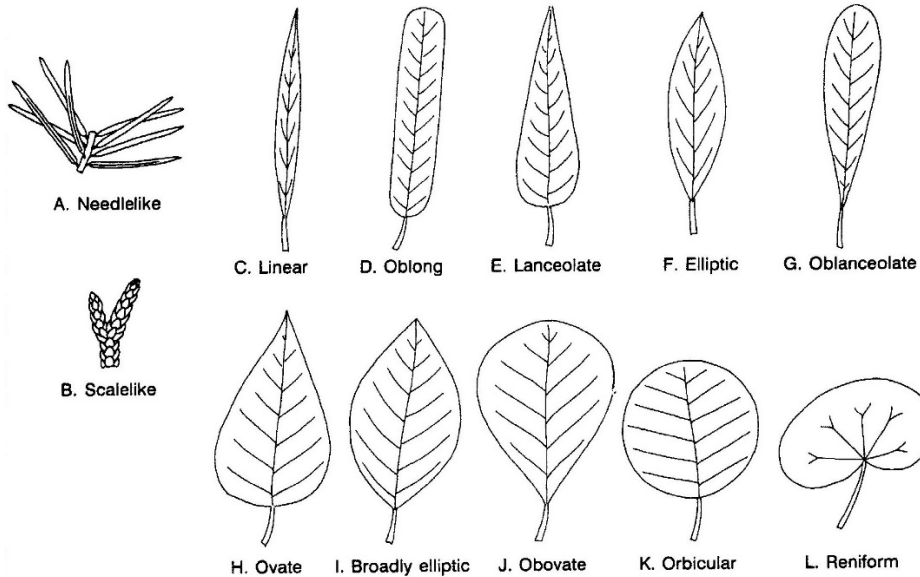
Figure 15-24 Variations of achenes and pappus structures. A. Pappus of simple bristles. B. Beaked achene with pappus of plumose (feather-like) bristles. C. Pappus of fringed scales. D. Pappus of a crown of low scales. E. Pappus of deciduous scales. F. Pappus of barbed awns. G. Epappose achene (without a pappus).



Symphyotrichum, Eurybia, Ionactis, Doellingeria (Tribe Astereae)

	pappus of disc florets	long petiolate & cordate basal lower leaves?	diagnostic features
<i>Symphyotrichum</i>	1(-2) series, 60-90 barbellate bristles	Y & N	inflorescences elongate, not flat-topped or dome-shaped; involucres 3-10 mm
<i>Eurybia</i>	1-2 series, 60-80 barbellate bristles	Y & N	inflorescences short & broad, flat-topped or shallowly dome- shaped; involucres 9-12 mm
<i>Ionactis</i>	2 series, inner barbed bristles, outer fewer & very short bristles	N	pappus, woody caudices, narrow, stiff, evenly distributed leaves; keeled phyllaries, heads borne singly or in loose corymbs
<i>Doellingeria</i>	4 series, outer short whitish subulate scales, inner 3 with 60-90 barbellate bristles	N	pappus, inflorescence a flat- topped corymbiform array
<i>Aster</i>	1-2 series, 20-30 barbellate bristles	N	basal leaves very robust, 25-50 cm long, 3-10 cm wide, persistent

Glossary



Radial head – inflorescence in the Asteraceae bearing disk flowers in the center and ray florets around the periphery

Phyllary – one of the involucre bracts present in the involucre of a head (or capitulum) inflorescence in Asteraceae

Involucre – one or more whorls of bracts immediately subtending a flower or inflorescence, often forming a cup-like structure

Clasping – a sessile leaf with lobes of blade tissue projecting around either side of the stem

Glaucous – a bluish-green, pale gray/whitish waxy surface covering

Involute – the margins of a flat surface rolled inward toward the upper surface

Areole – the non-vascularized spaces or tissue between the veins and veinlets of a net-veined leaf

Symphotrichum Reference Table. Data compiled by Dr. Thomas Rosburg from Brouillet et al. 2006, Eilers and Roosa 1994, Kartesz 2015, Iowa Natural Areas Inventory

Fields

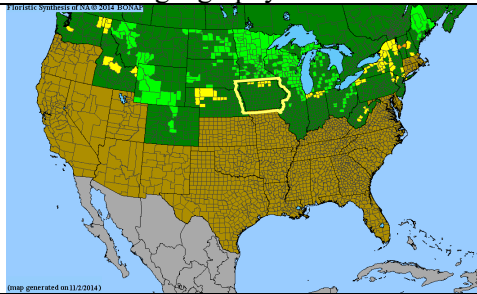
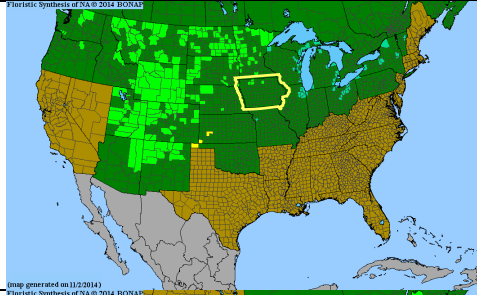
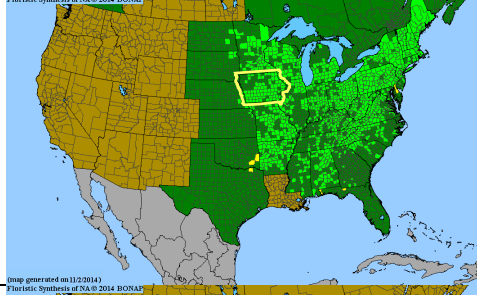
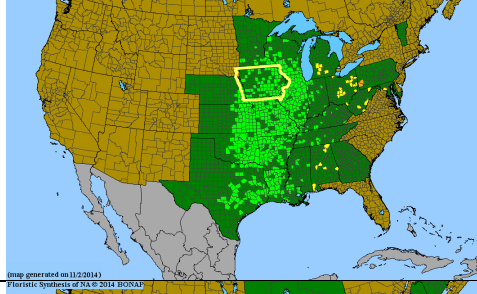
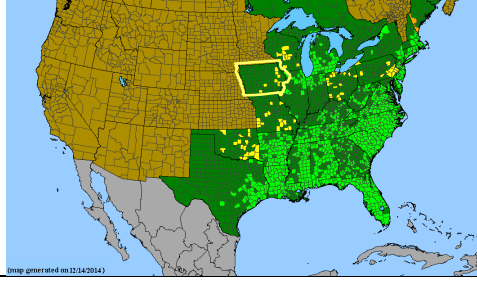
1-Currently accepted scientific name in Flora of North America. Iowa status (if listed) and data concerning occurrence in Iowa. Iowa Coefficient of Conservatism. Species with shading are most likely to be encountered and included in further discussion. Green = forest, woodland species, yellow = grassland species, blue = wetland species.

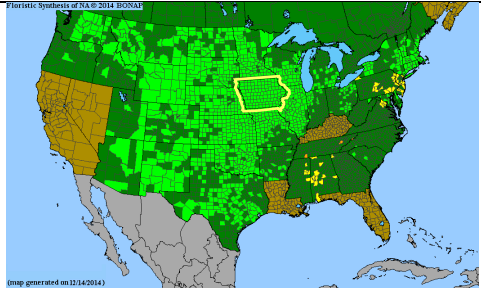
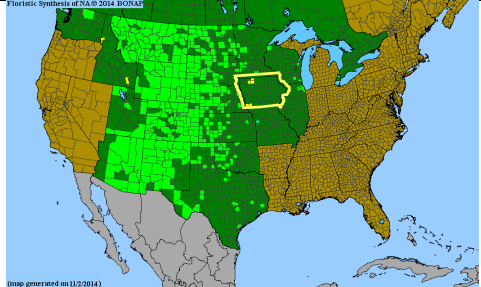

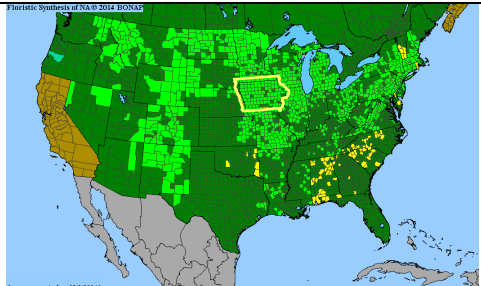
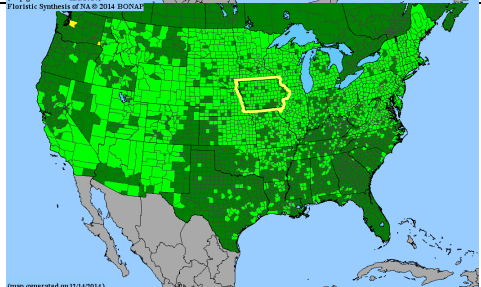
2-Nomenclature and synonyms in Eilers and Roosa 1994. Key identification characteristics.

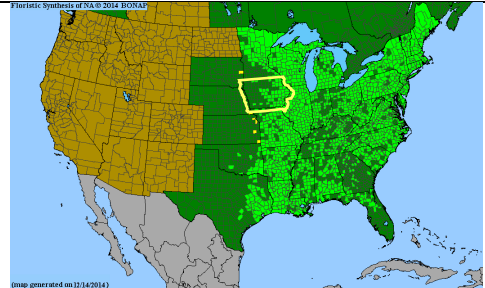
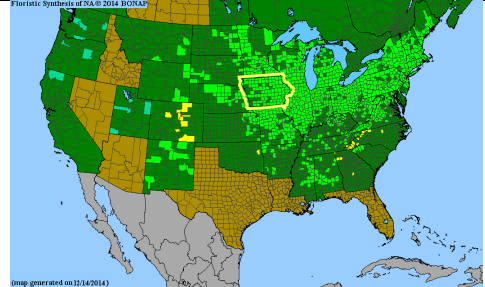
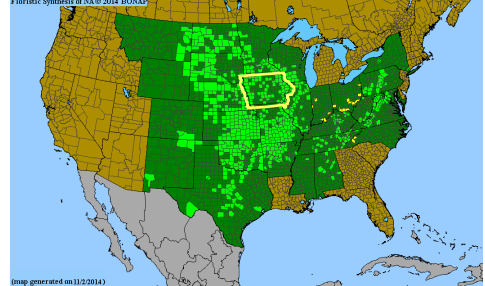
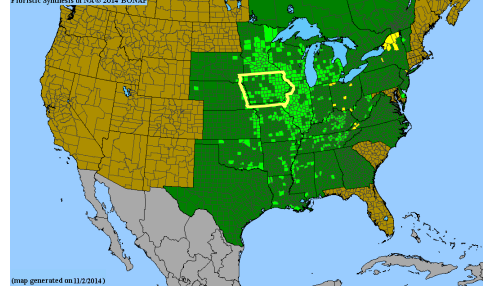
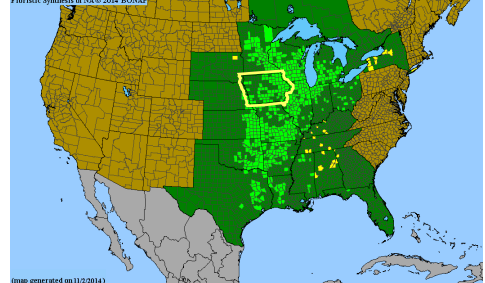
3-Common names indicated by Eilers and Roosa 1994 or observed in general use.

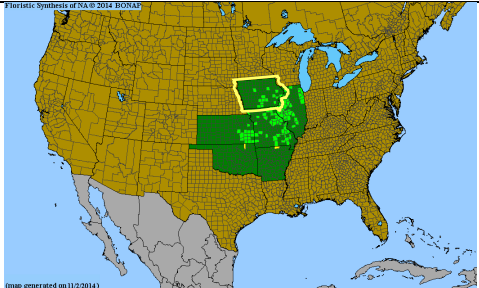
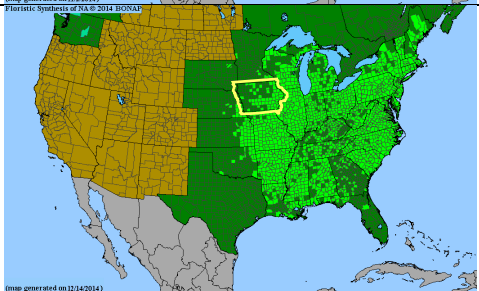
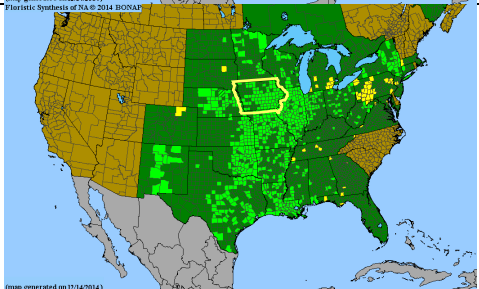
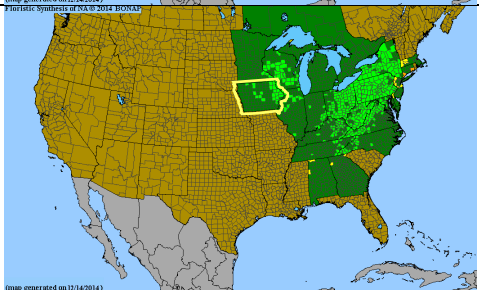
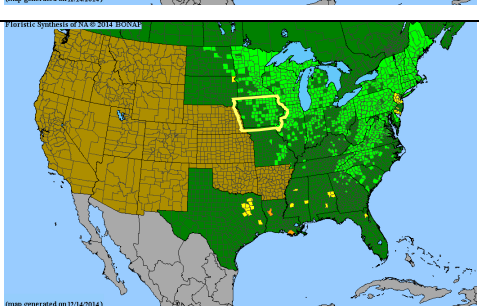
4-General habitat description

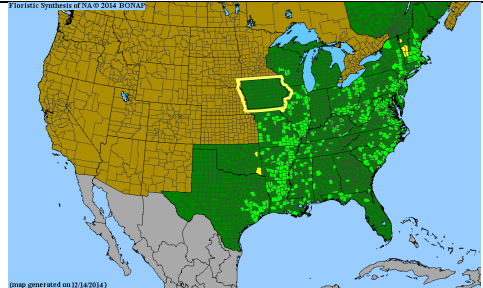
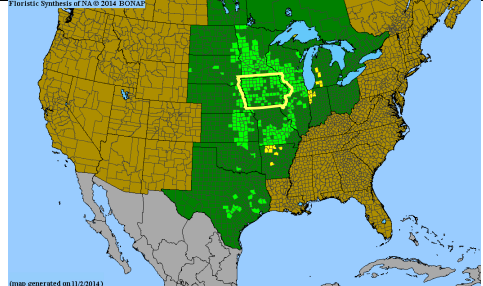
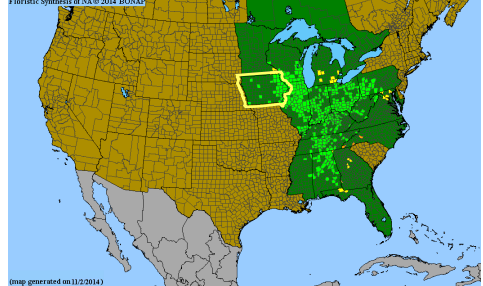
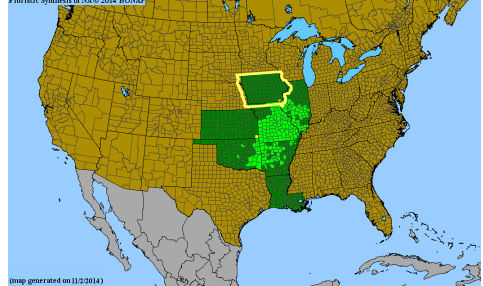
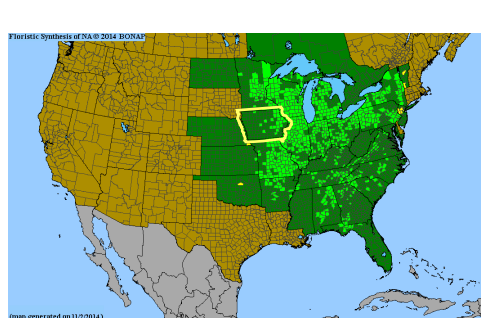
5-Biogeographical range according to BONAP

Flora of North America	Eilers and Roosa 1994	Common Names	Habitat	BONAP Biogeography
<p><i>Symphyotrichum boreale</i></p> <p>Threatened 15 observations, 9 counties last observation 2004 Iowa CC: 10 to 10 L</p>	<p><i>Aster junciformis</i> = <i>Aster borealis</i></p> <p>upper leaves linear, 15-90 to 2-12 mm wet habitat somewhat flimsy</p>	<p>rush aster slender white aster northern bog aster</p> <p><u>similar species:</u> lance-leaved</p>	<p>calcareous areas, fens, marshes, bogs, open cedar- tamarack-spruce swamps, riparian stream and pond, wet meadows, swales</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphyotrichum ciliatum</i></p> <p>Iowa CC: 2 to 2 L</p>	<p><i>Aster brachyactis</i></p> <p>heads appear discoid ray floret corollas poorly developed</p>	<p>rayless aster</p> <p><u>similar species:</u></p>	<p>shallow marshes, wet prairie, drying potholes, brackish soils, salt marshes, irrigation ditches, roadsides</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphyotrichum cordifolium</i></p> <p>Iowa CC: 7 to 7 H</p>	<p><i>Aster sagittifolius</i> <i>Aster cordifolius</i></p> <p>petioles of lower and basal leaves not winged or very narrowly winged</p>	<p>common blue wood aster arrow-leaved aster</p> <p><u>similar species:</u> Drummond's aster Short's aster big-leaf aster</p>	<p>mesic to dry, rocky to rich loamy upland soils, open forests and woodlands, forest edges and clearings, stream banks, thickets, roadsides</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphyotrichum drummondii</i> var. <i>drummondii</i> * var. <i>texanum</i></p> <p>Iowa CC: 4 to 5 L</p>	<p><i>Aster drummondii</i> = <i>Aster sagittifolius</i> var. <i>drummondii</i></p> <p>petioles of mid cauline leaves winged, margins serrate; stems hairy; bluish to lavender</p>	<p>Drummond's aster</p> <p><u>similar species:</u> common blue wood aster Short's aster big-leaf aster white arrow leaf aster</p>	<p>loamy or rocky, dry to mesic soils, in upland forests and woodlands, forest gaps, thickets, stream banks, roadsides</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphyotrichum dumosum</i></p> <p>Endangered 5 observations, 5 counties last observation 1963 Iowa CC: 10 to 10 L</p>	<p><i>Aster dumosus</i></p> <p>involucre 2.5-4.0 mm ray corollas 3-8 mm phyllaries with a short, elliptic green tip</p>	<p>rice button aster bushy aster</p> <p><u>similar species:</u> lance-leaf aster smooth white oldfield aster</p>	<p>mesic to wet soils, sandy floodplains in bogs, fens, sedge meadows, marshes, swamps, alluvial woodlands, lakeshores, interdunal hollows</p>	 <p><small>(map generated on 12/4/2014)</small></p>

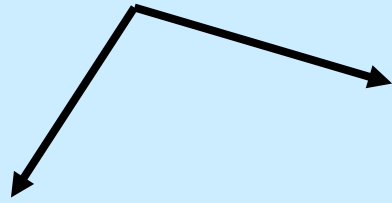
<p><i>Symphotrichum ericoides</i> var. <i>ericoides</i> * var. <i>pansum</i></p> <p>Iowa CC: 3 to 5 M</p>	<p><i>Aster ericoides</i> (var. <i>prostratus</i>)</p> <p>involucre 3-5 mm phyllaries short, recurved, spine-tipped; leaves ± falcate</p>	<p>heath aster</p> <p><u>similar species:</u> white prairie aster small white aster hairy aster</p>	<p>dry and mesic prairies, glades; fields, pasture, roadsides, railroad ROW</p>	 <p><small>(map generated on 11/2/2014)</small></p>
<p><i>Symphotrichum falcatum</i> var. <i>commutatum</i> * var. <i>falcatum</i></p> <p>Special Concern 2 observations, 2 counties last observation 1936 Iowa CC: 8 to 8 L</p>	<p><i>Aster falcatus</i> var. <i>commutatus</i></p> <p>involucre 5-8 mm ray florets 20-35 relatively few heads</p>	<p>white prairie aster western heath aster</p> <p><u>similar species:</u> heath aster small white aster hairy aster</p>	<p>dry plains & prairies, roadsides, railroad ROW, stream banks</p>	 <p><small>(map generated on 11/2/2014)</small></p>
<p><i>Symphotrichum firmum</i></p> <p>Iowa CC: pending</p>	<p>New Species <i>Aster puniceus</i> var. <i>lucidulus</i> var. <i>firmus</i> = <i>Aster lucidulus</i> upper leaf bases clasping, colonial from long rhizomes</p>	<p>glossy-leaved aster</p> <p><u>similar species:</u> swamp aster smooth blue aster</p>	<p>open, wet to mesic soils, fens, marshes, wet roadsides</p>	 <p><small>(map generated on 11/2/2014)</small></p> <p>FNA</p>
<p><i>Symphotrichum laeve</i> var. <i>laeve</i> * var. <i>geyeri</i> var. <i>concinnum</i> var. <i>purpuratum</i></p> <p>Iowa CC: 7 to 8 H</p>	<p><i>Aster laevis</i></p> <p>mid cauline leaves sessile, clasping, glabrous, ± glaucous</p>	<p>smooth blue aster</p> <p><u>similar species:</u> sky blue aster lance-leaf aster</p>	<p>dry to mesic soils, in midgrass and tallgrass prairies, dry open oak forest and woodlands, glades and alvars, roadsides</p>	 <p><small>(map generated on 11/2/2014)</small></p>
<p><i>Symphotrichum lanceolatum</i> var. <i>hesperium</i> * var. <i>hirsuticaule</i> * var. <i>interior</i> * var. <i>latifolium</i> * var. <i>lanceolatum</i> *</p> <p>Iowa CC: 4 to 4 H</p>	<p><i>Aster lanceolatus</i> ssp. <i>interior</i> = <i>Aster simplex</i></p> <p>long, lance-linear or lance-elliptic leaves ± glabrous; involucre 3.5-8 mm</p>	<p>lance-leaved aster panicled aster white panicled aster</p> <p><u>similar species:</u> rush aster rice-button aster smooth white oldfield aster</p>	<p>wet meadows and prairies, muck, peat and alluvial soils, riparian sites, wet woodland edges, wet thickets, roadsides,</p>	 <p><small>(map generated on 11/2/2014)</small></p>

<p><i>Symphyotrichum lateriflorum</i></p> <p>Iowa CC: 4 to 4 M</p>	<p><i>Aster lateriflorus</i></p> <p>disk corolla lobes comprise more than half the limb lower leaf blade hairy only on mid-vein</p>	<p>side-flowered aster white woodland aster</p> <p><u>similar species:</u> Ontario aster</p>	<p>dry to mesic deciduous woodlands and forests; woodland edges</p>	 <p><small>map generated on 12/14/2014 Floristic Synthesis of USA © 2014 BONAP</small></p>
<p><i>Symphyotrichum novae-angliae</i></p> <p>Iowa CC: 3 to 4 H</p>	<p><i>Aster novae-angliae</i></p> <p>involucre stipitate- glandular; leaf bases clasping</p>	<p>New England aster</p> <p><u>similar species:</u> swamp aster</p>	<p>mesic to wet-mesic prairies, wet swales, marsh edges, shrubby swamps, fens, shores, thickets, woodland edges, roadsides, railroad ROW</p>	 <p><small>map generated on 12/14/2014 Floristic Synthesis of USA © 2014 BONAP</small></p>
<p><i>Symphyotrichum oblongifolium</i></p> <p>Iowa CC: 10 to 8 H</p>	<p><i>Aster oblongifolius</i></p> <p>involucre, upper stems and leaves stipitate- glandular; leaves oblong to oblanceolate</p>	<p>aromatic aster</p> <p><u>similar species:</u> silky aster</p>	<p>dry, rocky, sandy, gravelly, or shaly soils, in limestone glades, sandstone or calcareous rock outcrops, open woodlands, prairies, pastures, dunes, roadsides</p>	 <p><small>map generated on 12/14/2014 Floristic Synthesis of USA © 2014 BONAP</small></p>
<p><i>Symphyotrichum ontarionis</i> var. <i>ontarionis</i> * var. <i>glabratum</i></p> <p>Iowa CC: 3 to 3 H</p>	<p><i>Aster ontarionis</i></p> <p>disk corolla lobes comprise more than half the limb lower leaf hairy across the entire blade</p>	<p>Ontario aster bottomland aster</p> <p><u>similar species:</u> side-flowered aster</p>	<p>shaded, usually moist, alluvial soils, stream or lake shores, floodplain deciduous forests, alluvial woodlands or thickets, bogs, marshes, edges of fields, roadsides</p>	 <p><small>map generated on 12/2/2014 Floristic Synthesis of USA © 2014 BONAP</small></p>
<p><i>Symphyotrichum oolentangiense</i></p> <p>Iowa CC: 7 to 8 H</p>	<p><i>Aster azureus</i> = <i>Aster oolentangiensis</i></p> <p>basal leaf bases cordate and ± entire</p>	<p>sky blue aster azure aster</p> <p><u>similar species:</u> smooth blue aster</p>	<p>dry, sandy, loamy, or rocky soils, in prairies, alvars, glades, bluffs, dunes, barrens, open deciduous woodlands, oak and pine savannas</p>	 <p><small>map generated on 12/2/2014 Floristic Synthesis of USA © 2014 BONAP</small></p>

<p><i>Symphotrichum parviceps</i></p> <p>Iowa CC: 4 to 4 L</p>	<p><i>Aster parviceps</i></p> <p>phyllaries marginally inrolled toward the tip, with a bristle or spine-like tip; involucre 3-4.5 mm</p>	<p>small white aster</p> <p><u>similar species:</u> white prairie aster heath aster hairy aster</p>	<p>dry, sandy or loamy soils, open woodlands, barrens, prairies, fields, roadsides</p>	 <p><small>Floristic Synthesis of NA © 2014 BONAP map generated on 12/14/2014</small></p>
<p><i>Symphotrichum pilosum</i> var. <i>pilosum</i> * var. <i>pringlei</i></p> <p>Iowa CC: 0 to 1 H</p>	<p><i>Aster pilosus</i></p> <p>phyllaries marginally inrolled toward the tip, with a bristle or spine-like tip; involucre 4-8 mm</p>	<p>hairy aster frost aster white oldfield aster</p> <p><u>similar species:</u> white prairie aster heath aster small white aster</p>	<p>often disturbed, dry to wet prairie, woodlands, pastures, old fields, roadsides</p>	 <p><small>Floristic Synthesis of NA © 2014 BONAP map generated on 12/14/2014</small></p>
<p><i>Symphotrichum praealtum</i></p> <p>Iowa CC: 5 to 4 L</p>	<p><i>Aster praealtum</i> = <i>Aster nebraskensis</i> = <i>Aster woldeni</i> disk corolla lobes comprise less than half the limb; lower leaf veinlets prominent & aroels isodiametric</p>	<p>willow aster willow-leaf aster</p> <p><u>similar species:</u> swamp aster lance-leaf aster</p>	<p>wet to mesic prairies or meadows, oak savannas, woodlands or thickets, forest edges and clearings, fields, lake and stream shorelines, roadsides</p>	 <p><small>Floristic Synthesis of NA © 2014 BONAP map generated on 12/14/2014</small></p>
<p><i>Symphotrichum prenanthoides</i></p> <p>Iowa CC: 7 to 7 M</p>	<p><i>Aster prenanthoides</i></p> <p>leaves coarsely serrate, tapering below the middle into a broadly winged petiole, bases strongly clasping; stem often zig-zag</p>	<p>crooked stem aster</p> <p><u>similar species:</u> swamp aster big-leaf aster</p>	<p>mesic or saturated soils, in woodland or forests, thickets, wet meadows, wet seeps, stream banks, wet roadsides</p>	 <p><small>Floristic Synthesis of NA © 2014 BONAP map generated on 12/14/2014</small></p>
<p><i>Symphotrichum puniceum</i> var. <i>puniceum</i> * var. <i>scabricaule</i></p> <p>Iowa CC: 5 to 5 H</p>	<p><i>Aster puniceus</i></p> <p>plants not colonial; stems bristly pubescent, usually purplish; lower leaf hairy on midvein</p>	<p>swamp aster purple stem aster</p> <p><u>similar species:</u> glossy-leaved aster</p>	<p>wet, often peaty, open to moderately shaded, in alluvial deciduous woodlands, thickets, swamps, edges of bogs, stream and lake shores, fens, marshes, wet meadows</p>	 <p><small>Floristic Synthesis of NA © 2014 BONAP map generated on 12/14/2014</small></p>

<p><i>Symphotrichum racemosum</i></p> <p>Iowa CC: pending</p>	<p>New Species</p> <p>heads mostly solitary at the branch tips; leaf margins \pm revolute; proximal leaves petiolate or subpetiolate</p>	<p>smooth white oldfield aster small white aster</p> <p><u>similar species:</u> lance leaf aster</p>	<p>moist to wet, usually alluvial soils, in open woodlands or savannas, swamp edges, prairie swales, wet meadows, marshes, bogs, often brackish habitats</p>	 <p><small>(map generated on 11/14/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphotrichum sericeum</i></p> <p>Iowa CC: 10 to 10 H</p>	<p><i>Aster sericeus</i></p> <p>leaves densely hairy with short appressed hairs; stems wiry grayish to dark brown, upper stems hairy</p>	<p>silky aster</p> <p><u>similar species:</u> aromatic aster</p>	<p>dry, sandy, loamy or rocky soils, limestone outcrops, open woodlands, prairies, fields, sand barrens, dunes, loess hills</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphotrichum shortii</i></p> <p>Iowa CC: 7 to 7 H</p>	<p><i>Aster shortii</i></p> <p>leaves petiolate with cordate bases and entire margins; phyllaries strigose on back</p>	<p>Short's aster</p> <p><u>similar species:</u> sky blue aster common blue wood aster</p>	<p>upland, often thin well-drained mesic soils, in oak-hickory forests and woodlands, stream banks, cliffs, roadsides</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphotrichum turbinellum</i></p> <p>Special Concern 1 observation, 1 county last observation 1952 Iowa CC: 8 to 8 L</p>	<p><i>Aster turbinellus</i></p> <p>involucre 7-12 mm, phyllaries not inrolled at the tip; ray corolla 10-18, purple to purplish blue</p>	<p>prairie aster</p> <p><u>similar species:</u></p>	<p>dry, acidic (chert, sandstone, or granite), rocky or loamy upland soils in prairie, glades, woodland, open forest, pastures, roadsides</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>
<p><i>Symphotrichum urophyllum</i></p> <p>Iowa CC: pending</p>	<p>New Species <i>Aster sagittifolius</i> var. <i>dissitiflorus</i></p> <p>petioles of mid cauline leaves winged, margins serrate; stems mostly glabrous (sparsely hairy in lines); mostly white</p>	<p>white arrow leaf aster</p> <p><u>similar species:</u> Drummond's aster common blue wood aster</p>	<p>dry or mesic, sandy, loamy, or rocky soils, in glades, savanna, open woodlands, woodland edges; old fields, roadsides, railroad ROW</p>	 <p><small>(map generated on 11/2/2014) Floristic Synthesis of NA © 2014 BONAP</small></p>

Splitting up 18 Iowa *Symphotrichum* species



Basal and lower leaves not cordate or if somewhat so, the leaves sessile, without a distinct petiole

GROUPS B, C, D, E, F



2- Ontario

Basal and lower leaves long petiolate and the blade with a cordate to abruptly rounded or less commonly truncate base
GROUP A



1- sky blue

middle leaf margins regularly serrate (toothed)



3- white arrow leaf

blue wood aster
white arrow leaf aster
Drummond's aster
GROUP A1

middle leaf margins entire (smooth, no teeth) or subserrate (with small, widely spaced teeth)



4- smooth blue

smooth blue aster
sky blue aster
Short's aster
GROUP A2

GROUP A1

*petiole of lower stem leaves unwinged or narrowly winged (< 1 mm)
phyllaries merely acute, sometimes with a mucro (slender short point)

blue wood aster

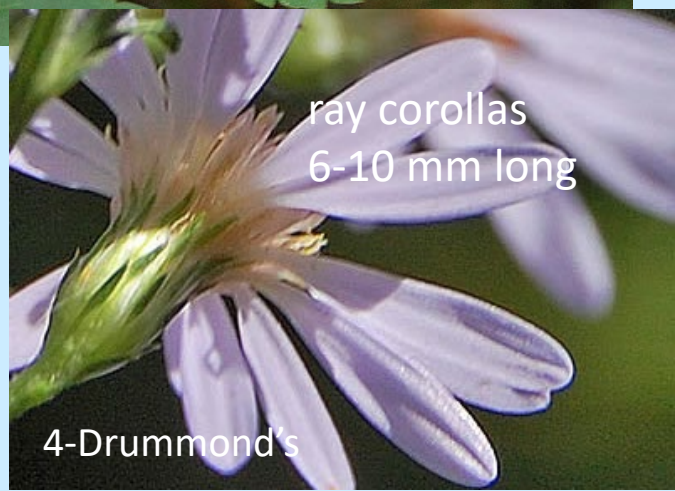
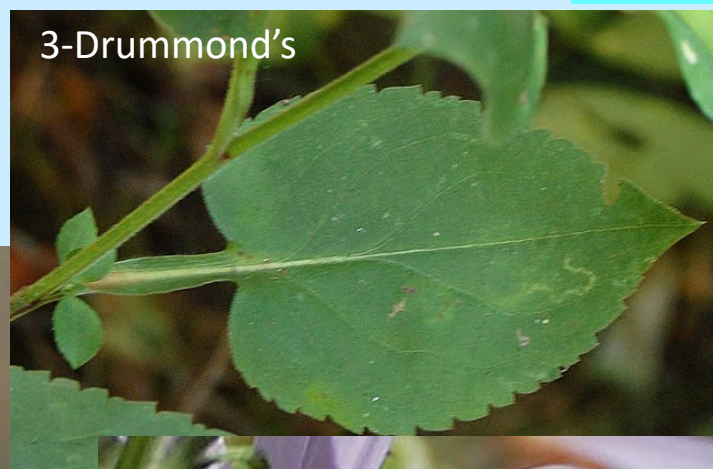
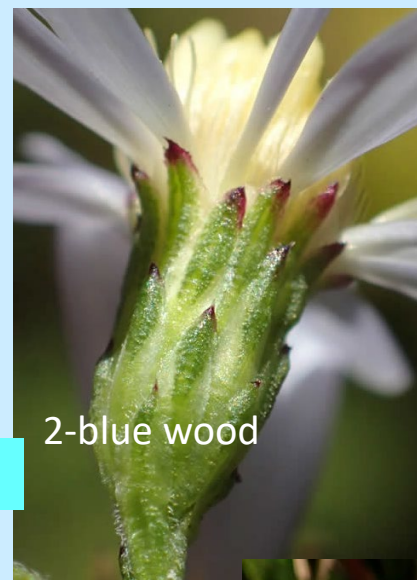
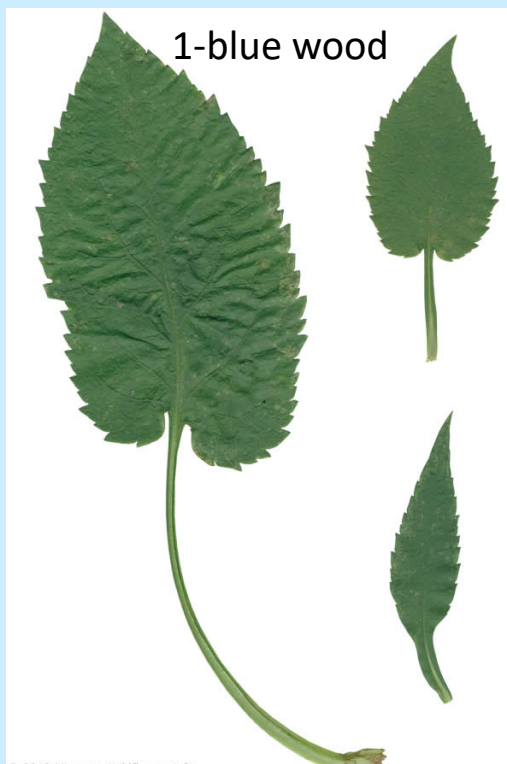
*petiole of lower stem leaves winged (1-3.5 mm)
phyllaries acuminate or attenuate

→ rays white (pale lavender), stems glabrous or
sparsely hairy in vertical bands

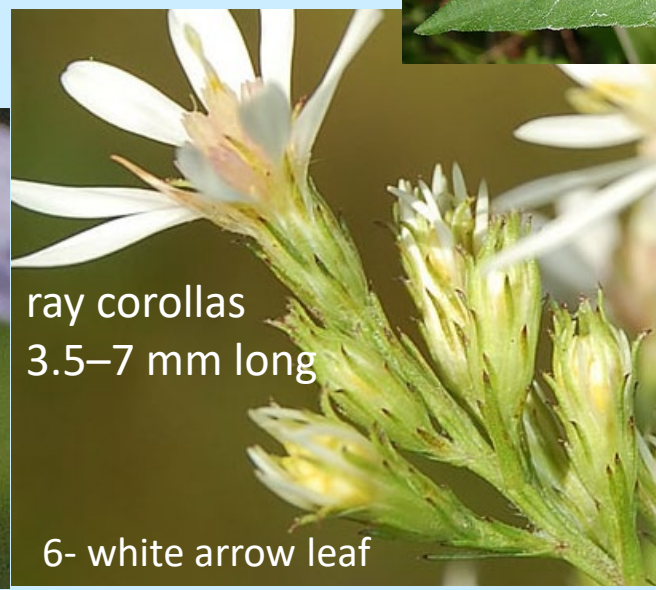
white arrow leaf aster

→ rays bright blue to purple or lavender, stems
moderately to densely and evenly hairy

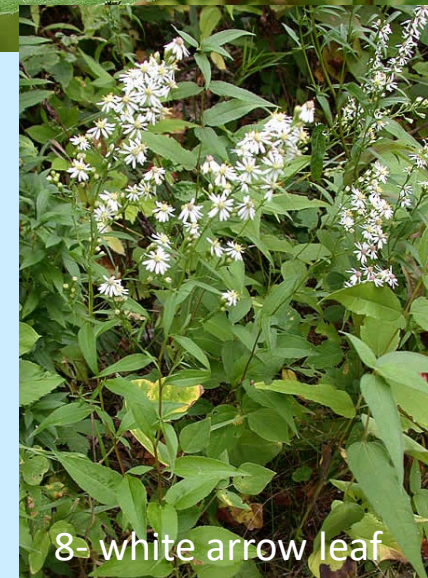
Drummond's aster



ray corollas
6-10 mm long



ray corollas
3.5-7 mm long



GROUP A2

*leaves at middle of stem sessile and clasping, smooth and glabrous, \pm glaucous **smooth blue aster**

*leaves at middle of stem petioled or tapered to base, scabrous (at least above), not glaucous

→ upper part of stem essentially glabrous; phyllaries glabrous, the widest usually 1 mm broad; only lower leaves cordate; drier sites (prairie) **sky blue aster**

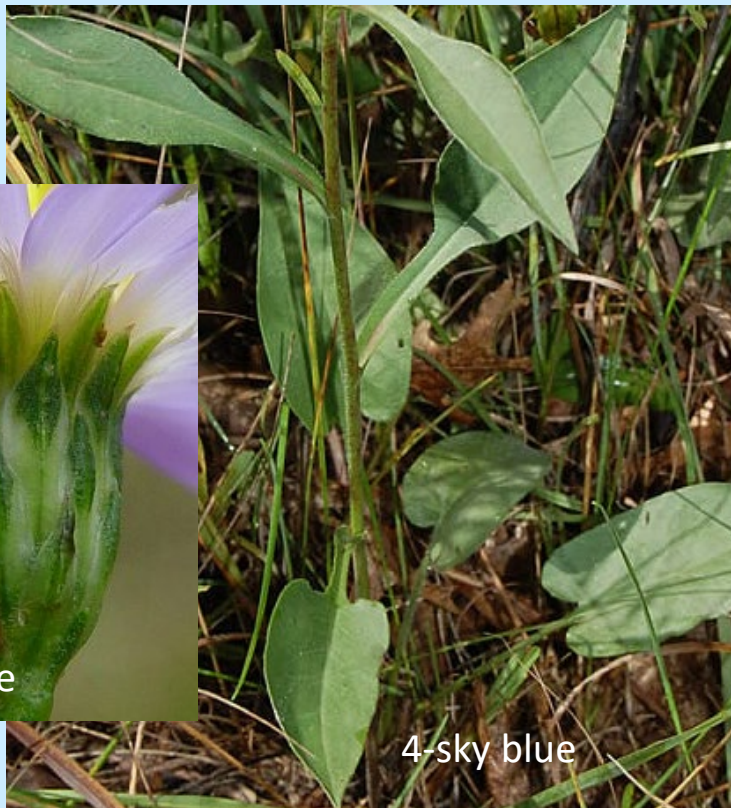
→ upper part of stem evenly hairy; phyllaries strigose, distinctly <1 mm broad; most all leaves cordate; moist, shaded sites (forest) **Short's aster**



1-smooth blue



2-smooth blue



4-sky blue



5-Short's



6-Short's



3-sky blue

Basal and lower leaves **not cordate** or if somewhat so, the leaves sessile, without a distinct petiole

GROUP B

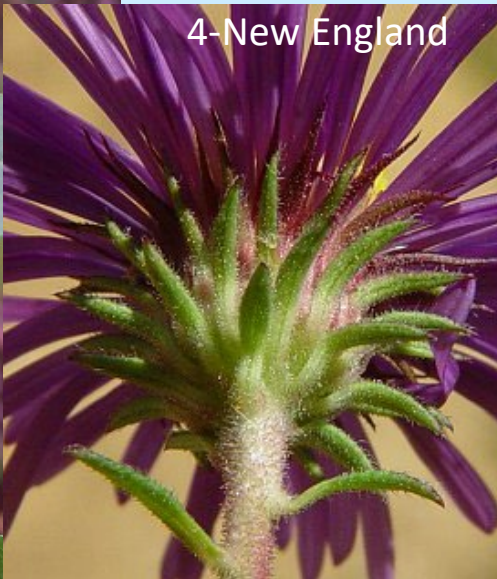
One of two distinctive features present:
* leaf surfaces and phyllaries densely pubescent with appressed silky hairs, appearing grayish or silvery **silky aster**
* stalk and involucre stipitate-glandular pubescent, upper portions of stems and leaves sometimes also stipitate-glandular

→ leaf bases auriculate, strongly clasping; phyllaries linear, long tapering; wet-mesic sites
→ leaf bases rounded, weakly clasping; phyllaries oblong to lanceolate; dry sites

No dense silky pubescence, no stipitate-glandular pubescence
GROUPS C, D, E, F



New England aster



aromatic aster

No dense **silky pubescence**, no **stipitate-glandular pubescence**

GROUP C

Most leaves (except basal and sometimes lowermost stem leaves) with a broad base strongly to moderately auriculate-clasping

* leaves, stems, involucres, and often pedicels glabrous, eglandular, and glaucous **smooth blue aster**

* leaves, stems, involucres, and/or pedicels pubescent, in some species glandular, and not glaucous

→ leaves coarsely serrate, lanceolate to ovate, tapered below the middle into a broadly winged petiole, strongly auriculate-clasping; stem often zig-zag **crooked stem aster**

→ leaves finely serrate to entire, lanceolate to elliptic, tapering to a sessile base, moderately auriculate-clasping; stem ± straight **swamp aster**

Leaf bases tapered, angled, rounded, or occasionally appearing truncate, sometimes somewhat sheathing or only slightly clasping the stem **GROUPS D, E, F**



Leaf bases tapered, angled, rounded, occasionally truncate, or only slightly clasping the stem

GROUP D

White-flowered; typically ± dry grasslands, fields, open woodland, barrens, roadsides

White, blue or purple-flowered; typically mesic or wet-mesic forests, grasslands GROUPS E, F

*phyllaries not inrolled at the tip, lanceolate, ± thickened, tapered to a recurved, sharply pointed spine tip **heath aster**

*outer phyllaries somewhat marginally inrolled at the tip, involute to subulate, somewhat tubular, tapered to an awl-shaped, sharply pointed, green tip with a short, white to yellowish or purplish-tinged, minute bristle-like point

→ involucre 3.0-4.5 mm long, narrowly ellipsoidal to narrowly cup-shaped or nearly cylindrical; disk florets 6-12; ray florets 10-16 **small white aster**

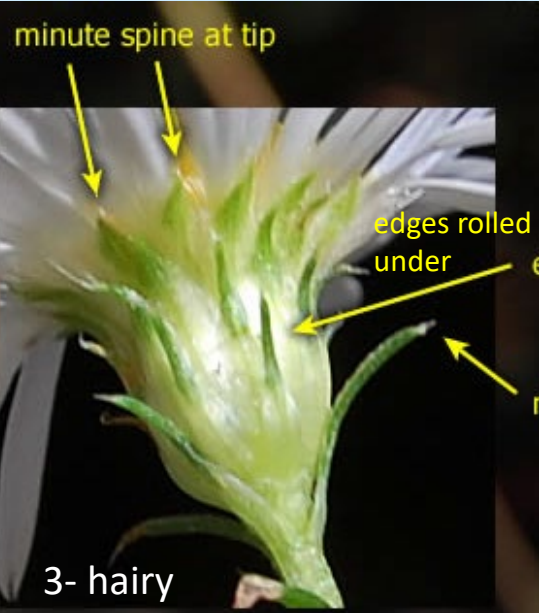
→ involucre 4-8 mm long, urn-shaped to ± cup-shaped when fresh; disk florets 20-40; ray florets 15-35 **hairy aster**



1- heath



2- heath



3- hairy



4- hairy



5- hairy



6- hairy



7- small white

White, blue or purple-flowered; typically mesic or wet-mesic forests, grasslands



GROUP E

Disc corollas with the lobes relatively long (0.9-1.7 mm), 45-75% of the total length of the expanded upper portion of the corolla (the portion above the slender basal portion of the tube)

[lobes of the disk corollas comprise more than half of the limb]

* ventral surface of leaves moderately or densely short pubescent along the midvein, rarely with a few hairs along the lateral veins, otherwise glabrous **side-flowered aster**

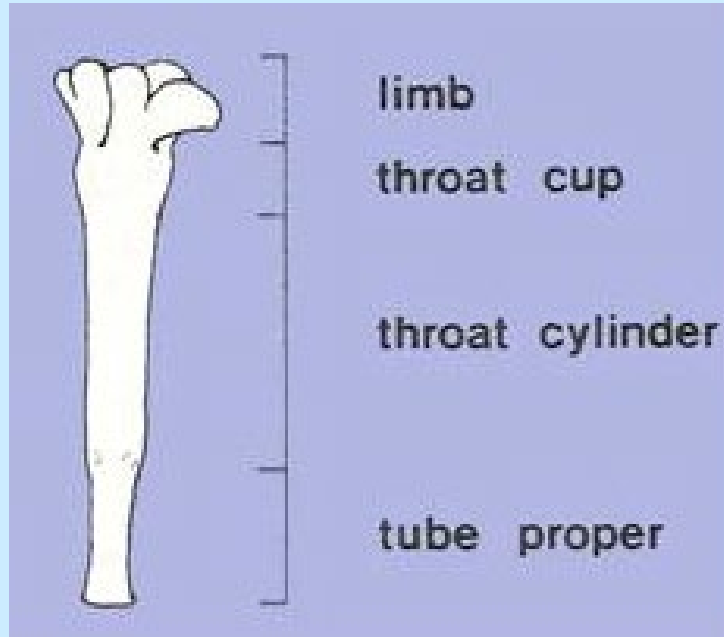
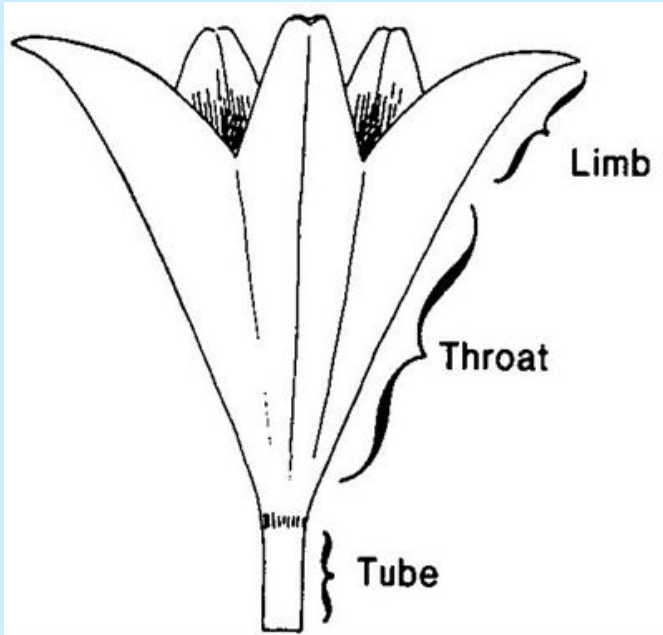
* ventral surface of leaves (at least middle and upper ones) sparsely to moderately and evenly short pubescent across the entire leaf **Ontario aster**

Disc corollas with the lobes relatively short (0.4-1.2 mm), 15-45% of the total length of the expanded upper portion (above the slender basal portion of the tube) of the corolla

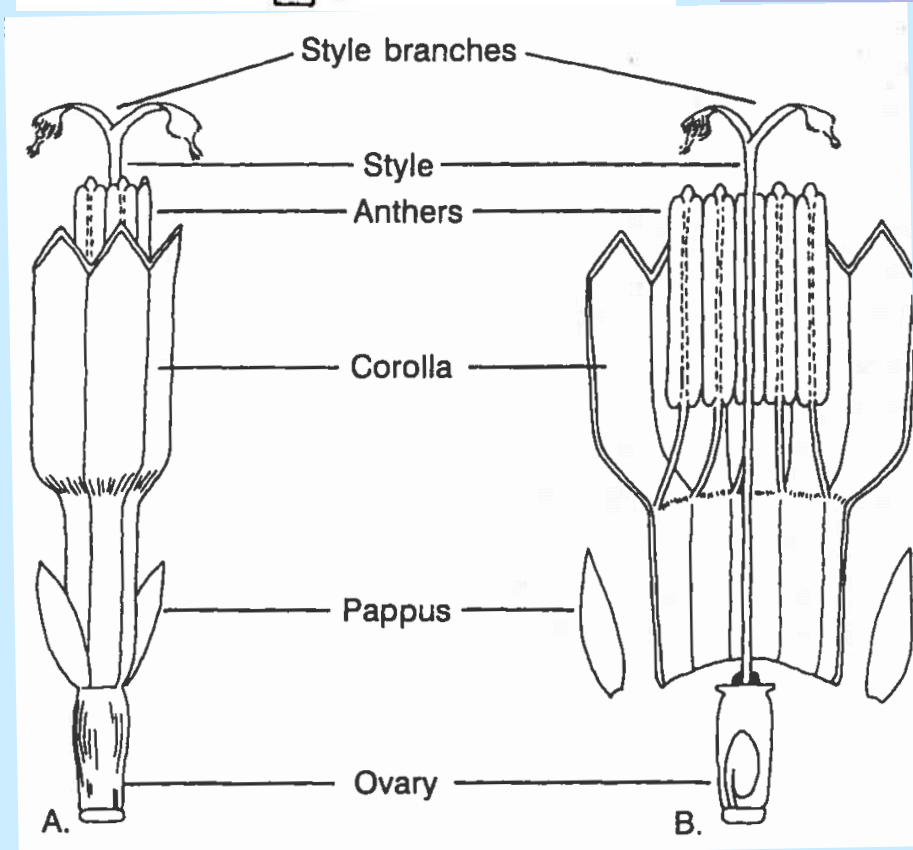
[lobes of the disk corolla comprise less than half of the limb] GROUP F



Corolla Morphology



limb = corolla lobes



FNA

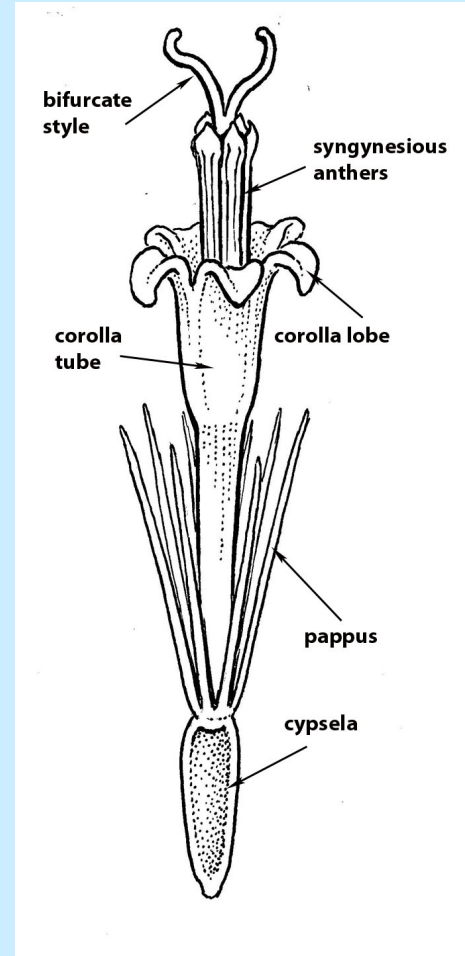
corolla lobes

throat

tube

limb

Lobes comprise 23% of the limb



Disc corollas with the lobes relatively short (0.4-1.2 mm), 15-45% of the total length of the expanded upper portion (above the slender basal portion of the tube) of the corolla
[lobes of the disk corolla comprise less than half of the limb]

* leaves beneath with a distinct regular reticulate pattern formed by dark, prominent veinlets around paler green areoles about 0.6 mm in diameter, about as long as wide or slightly longer than wide; ray corollas purple or bluish (very rarely white) **willow aster**

* leaves beneath without a distinct reticulation, veinlets faint or if prominent the areoles clearly irregular or elongate and much longer than wide; ray corollas mostly white, less commonly bluish-tinged or lavender **lance-leaf aster**



Hybrid species

Symphyotrichum × *amethystinum* (F1 hybrid between *S. ericoides* and *S. novae-angliae*) is reported from north central and east central Iowa

Hybridization is common in *Symphyotrichum* and has had an important role in the taxonomy of evolution of the genus. Genetic diversity within each species appears to be considerable. The plasticity exhibited by species and genetic variation within species have been ascribed mistakenly to hybridization. There are many purported hybrids among species.

Symphyotrichum species unknown for Iowa, but which occur in adjacent states

Symphyotrichum patens (MO, IL)

Symphyotrichum subulatum (NE, IL)

Symphyotrichum fendleri (NE)

Symphyotrichum undulatum (IL)

Symphyotrichum anomalum (MO, IL)

Symphyotrichum ciliolatum (SD, MN, WI, IL)

Symphyotrichum robynsonianum (MN, WI)

References

Brouillet, L., J.C. Semple, G.A. Allen, K.L. Chambers, and S.D. Sundberg. 2006. *Symphyotrichum*. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 19+ vols. New York and Oxford. Vol. 20, pp. 465

Eilers, L.J. and D.M. Roosa. 1994. The Vascular Plants of Iowa: An Annotated Checklist and Natural History. University of Iowa Press, Iowa City, IA

Kartesz, J.T. 2015. The Biota of North America Program (BONAP). North American Plant Atlas. <http://bonap.net/napa>. Chapel Hill, NC.

Murrell, Z. 2010. Vascular Plant Taxonomy. Kendall Hunt Publishing Company, Dubuque, IA

Voss, E.G. and A.A. Reznicek. 2012. Field Manual of Michigan Flora. University of Michigan Press, Ann Arbor, MI.

Yatskievych, G. 2006. Steyermark's Flora of Missouri Volume 2. Missouri Botanical Garden Press, St. Louis MO and Missouri Department of Conservation, Jefferson City, MO.

Iowa *Symphyotrichum* and other asters

Adapted from keys in Yatskievych, G. 2006. Steyermark's Flora of Missouri Volume 2. Missouri Botanical Garden Press; Voss, E.G. and A.A. Reznicek 2012. Field Manual of Michigan Flora. University of Michigan; and Brouillet, L. et al. 2006. *Symphyotrichum*. In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 19+ vols. New York and Oxford. Vol. 20, pp. 465 by Thomas R. Rosburg (August 2019).

- 1a. Basal and lower leaves long petiolate and the blade with a cordate to abruptly rounded or less commonly truncate base
 - 2a. Mid-cauline leaf margins entire, or rarely with a few minute, widely spaced teeth
 - 3a. Leaves at middle of stem sessile and clasping, smooth and glabrous, ± glaucous.....*S. laeve* (in part)
(smooth blue aster)
 - 3b. Leaves at middle of stem petioled or tapered to base, scabrous (at least above), not glaucous
 - 4a. Upper part of stem essentially glabrous (or unevenly pubescent, e.g., in lines or stripes) and undersides of leaves scabrous to sparsely pubescent (with some longer, softer hairs especially along the midrib); phyllaries glabrous, at least the widest usually (0.9-) 1 mm broad, with the diamond-shaped green tip often only 1-2 times as long as wide; only the lower leaves cordate, middle to upper leaves becoming smaller, sessile and lanceolate or linear; plants of prairies, dry woodlands or savannas.....
.....*S. oolentangiense* (sky blue aster)
 - 4b. Upper part of stem and undersides of leaves evenly rough-hispidulous with tiny widely spreading hairs; phyllaries strigose on back, all distinctly less than 1 mm wide, with the diamond-shaped green tip mostly at least twice as long as wide; most all the leaves cordate or subcordate, middle to upper leaves becoming smaller and less cordate, ± ovate, never linear; plants of moist upland woodlands and forests.....*S. shortii*
(Short's aster)
 - 2b. Mid-cauline leaf margins serrate along all or most of the blade
 - 5a. Lower and basal leaves with blades deeply cordate, the sinus 5-15(-30) mm deep, and blades prominently toothed, some teeth (1.5-)2-5 mm long on forward margin; petioles, especially on mid-cauline leaves, wingless or narrowly winged (1 mm or less on each side); phyllaries merely acute, the diamond-shaped green area usually about 3-4 times as long as broad or shorter (at least on outer phyllaries); inflorescence open, paniculiform, the heads with rays pale blue to purplish (occasionally white).....*S. cordifolium*
(blue wood aster)
 - 5b. Lower and basal leaves with blades truncate, broadly rounded, or subcordate at base, the sinus rarely over 5 mm deep, and blades usually shallowly toothed; petioles, especially on mid-cauline leaves, often winged 1-3.5(-6) mm on each side (especially near the blade); phyllaries acuminate or attenuate, the diamond-shaped green area prolonged and narrowly elliptic to nearly linear (mostly 6-10 times as long as wide) or (especially in *S. urophyllum*) obscure; inflorescence and rays various
 - 6a. Ray corollas white (rarely pale pinkish or lavender), 3.5–7 mm long; stems glabrous or sparsely to moderately pubescent in longitudinal lines or bands toward the tip..... *S. urophyllum* (arrow-leaf aster)
 - 6b. Ray corollas bright blue, 6–10 mm long; stems moderately to densely and evenly pubescent, at least above the mid-point.....*S. drummondii* (Drummond's aster)
- 1b. Basal and lower leaves not cordate or if somewhat so, the leaves sessile, not distinctly petioled
 - 7a. Heads appearing discoid, the pistillate marginal florets with an inconspicuous tubular corolla shorter than the pappus and disc corollas.....*S. ciliatum* (rayless aster)
 - 7b. Heads radiate, the pistillate marginal florets with a well-developed ligulate corolla noticeably longer than the pappus and the disc corollas
 - 8a. Both surfaces of leaves and the margins and abaxial surfaces of involucre bracts densely pubescent with appressed silky hairs, appearing grayish or silvery; stems wiry and brittle.....*S. sericeum* (silky aster)
 - 8b. Leaves glabrous, or with 1 or both surfaces sparsely to moderately pubescent, the hairs not appressed and appearing silvery, involucre bracts various, but not silvery; stems not wiry
 - 9a. Heads with the stalk and involucre stipitate-glandular pubescent, the upper portions of the stems and leaves sometimes also stipitate-glandular

Iowa *Symphyotrichum* and other asters

- 10a. Involucral bracts mostly linear, long-tapered to the slender, sharply pointed tip; ray florets 40-100; stem leaves with the base cordate and clasping the stem; plants of moist soil (wet-mesic prairies).....*S. novae-angliae*
(New England aster)
- 10b. Involucral bracts mostly narrowly oblong to narrowly oblong-ob lanceolate, all but the inner series angled to short-tapered to the sharply pointed tip; ray florets 12-35; stem leaves with the base variously shaped; plants of dry soil (gravel prairie, loess prairie).....*S. oblongifolium* (aromatic aster)
- 9b. Heads with the stalk and involucre glabrous to variously pubescent, but not glandular; stems and leaves not glandular
- 11a. Most leaves (except the basal and sometimes lowermost stem leaves) with a broad base strongly to moderately auriculate-clasping
- 12a. Leaves linear, mid to upper cauline leaves < 10 mm wide, 2 to 15 cm long; plants of northern wet habitats (marsh, fen, bog).....*S. boreale* (northern bog aster)
- 12b. Leaves not linear, variously lanceolate, elliptic, oblong, ovate, mid to upper cauline leaves > 10 mm wide; plants of wetlands, forests or prairies
- 13a. Leaves, stems, involucre, and/or pedicels pubescent, in some species glandular, and not glaucous; phyllaries subequal, green zones linear-lanceolate
- 14a. Leaves coarsely serrate, lanceolate to ovate and contracted below the middle into a broadly winged petiole, strongly auriculate-clasping; stem often zig-zag.....*S. prenanthoides*
(crooked stem aster)
- 14b. Leaves finely serrate to entire, lanceolate to elliptic and tapering to a sessile base, moderately auriculate-clasping; stem ± straight
- 15a. Plants with long-creeping rhizomes, colonial; stems glabrous or pubescent in lines, green or sometimes purple; cauline leaves mostly glabrous beneath; ray florets pale lavender.....*S. firmum* (glossy-leaf aster)
- 15b. Plants with a short, usually ascending perennial base, solitary or cespitose, not colonial from long-creeping rhizomes; stems bristly pubescent, usually purplish; cauline leaves conspicuously pubescent along the midvein on the underside; ray florets blue to purple.....*S. puniceum* (swamp aster)
- 13b. Leaves, stems, involucre, and often pedicels glabrous, eglandular, and glaucous; phyllaries unequal, green zones mostly diamond shape to lanceolate..... *S. laeve* (in part)
- 11b. Leaves with a slender or slightly expanded base, sometimes somewhat sheathing but not or slightly clasping the stem, tapered, angled, rounded, or occasionally appearing truncate
- 16a. All or at least the outer involucral bracts somewhat marginally inrolled at the tip, subulate, somewhat tubular, tapered to a slightly thickened, awl-shaped, sharply pointed, green tip with a short, white to yellowish or purplish-tinged, relatively stout and spinelike point (less commonly a slender and hairlike point), involucral bracts often with an outward curve then upward curve
- 17a. Involucre 3.0-4.5 mm long, narrowly ellipsoidal to narrowly cup-shaped or nearly cylindrical; disc florets 6-12; ray florets 10-16(-18), the corollas 3.5-6.0 mm long....*S. parviceps* (small white aster)
- 17b. Involucre 4-8 mm long, urn-shaped to ± cup-shaped when fresh; disc florets 20-40; ray florets 15-35, the corollas 5.0-10.0 mm long.....*S. pilosum* (hairy aster)
- 16a. Involucral bracts not inrolled at the tip, angled or tapered to a relatively flat, sharply pointed tip, this sometimes with a minute white to tan or purplish-tinged, slender (occasionally hairlike) point at the very tip, involucral bracts various, either ± straight or recurved
- 18a. Involucre (6-)7-12 mm long, the bracts in 6-9 unequal series, rounded or angled to a bluntly pointed or sometimes sharply pointed tip; ray florets with the corolla 10-18 mm long, purple to purplish blue.....
.....*S. turbinellum* (prairie aster)
- 18b. Involucre 2.5-7(-8.0) mm long, the bracts in 3-6 subequal series, angled or tapered to a sharply pointed tip; ray florets with the corolla 2.5-10.0(-12.0) mm long, usually white, rarely pinkish-tinged or lavender

Iowa *Symphotrichum* and other asters

- 19a. At least the outer involucre bracts loosely ascending to spreading, sparsely to moderately pubescent on the outer (abaxial) surface (sometimes only along the midvein), relatively densely pubescent along the margins, the tip with a minute, bristlelike extension of the midvein or a short, hard, white to yellowish to purplish spinelike point
- 20a. Involucre 3-5 mm long; ray florets 8-20; heads relatively numerous along the inflorescence branches, all or most oriented toward 1 side of each branch.....*S. ericoides* (heath aster)
- 20b. Involucre 5-8 mm long; ray florets (15-)20-35; heads appearing fewer, solitary or in small clusters at the tips of the inflorescence branches, oriented in various directions.....*S. falcatum* (white prairie aster)
- 19b. Involucre bracts erect or strongly ascending, the outermost occasionally somewhat loosely ascending, glabrous or puberulent along the margins, the tip bluntly to sharply pointed, lacking a bristlelike extension of the midvein or a short, hard, white to yellowish to purplish spinelike point (if a short bristlelike tip present in *S. ontarionis*, then the body of the bract flat and not inrolled toward the tip)
- 21a. Disc corollas with the lobes relatively long (0.9-1.7 mm), 45-75% of the total length of the expanded upper portion (above the slender basal portion of the tube) of the corolla [lobes of the disk corollas comprise more than half of the limb]
- 22a. Ventral surface of leaves moderately or densely short pubescent along the midvein, rarely with a few hairs along the lateral veins, otherwise glabrous (except for the minutely pubescent margins..*S. lateriflorum* (side-flowering aster)
- 22b. Ventral surface of leaves (at least median and upper ones) sparsely to moderately and evenly short pubescent (including the tissue between the veins), sometimes with slightly longer or denser hairs along the midvein.....*S. ontarionis* (Ontario aster)
- 21b. Disc corollas with the lobes relatively short (0.4-1.2 mm), 15-45% of the total length of the expanded upper portion (above the slender basal portion of the tube) of the corolla [lobes of the disk corolla comprise less than half of the limb]
- 23a. Leaves beneath with a distinct regular reticulate pattern formed by dark, prominent veinlets around paler green areoles about 0.6 mm in diameter, about as long as wide or slightly longer than wide; ray corollas purple or bluish (very rarely white).....*S. praealtum* (willow aster)
- 23b. Leaves beneath without a distinct reticulation, veinlets faint or if prominent the areoles clearly irregular or elongate and much longer than wide; ray corollas mostly white, less commonly bluish-tinged or lavender
- 24a. Involucre 3.5-8.0 mm long; ray corollas 5-12 mm long; heads solitary or clustered at the branch tips or oriented in various directions and ± racemose along the inflorescence branches; largest stem leaves (3-)6-40 mm wide.....*S. lanceolatum* (lance-leaf aster)
- 24b. Involucre 2.5-4.0 mm long; ray corollas 3-8 mm long; heads solitary at the branch tips or arranged in 1-sided racemes along the inflorescence branches; largest stem leaves 1-7(-11) mm wide
- 25a. Median and inner series of involucre bracts with a relatively short, elliptic to diamond-shaped green tip, this up to ½ the length of the bract; heads mostly solitary at the ends of inflorescence branches, or if racemose, then the heads mostly relatively long-stalked.....*S. dumosum* (bush aster)
- 25b. Median and inner series of involucre bracts with a relatively elongate, elliptic green tip, this more than ½ the length of the bract; heads solitary or in clusters at the ends of inflorescence branches, or if racemose, then the heads mostly relatively short-stalked
- 26a. Heads mostly in small clusters toward the branch tips or appearing racemose, the stalks relatively short and few-bracted 1-3(-5), linear-oblongate to lanceolate, foliaceous (not grading into phyllaries); leaf margins flat, sparsely serrate or entire; proximal leaves sessile or subsessile (± decurrent), only slightly reduced distally.....*S. lanceolatum* (lance-leaf aster)
- 26b. Heads mostly solitary at the branch tips, sometimes in small loose clusters, the stalks relatively long and many-bracted 5-15+, linear-elliptic to linear or acicular, sometimes foliaceous grading into phyllaries; leaf margins ± revolute, serrate or entire; proximal leaves petiolate or subpetiolate, progressively reduced distally.....*S. racemosum* (smooth white oldfield aster)