Taxonomic Adjustment Proposals and Field Species for 2023

Taxonomic adjustments to align with Weakley (unless we object)

Crataegus dilatata to C. coccinioides
Eleocharia pauciflora var. fernaldii to E. quinqueflora
Solidago speciosa var. speciosa, remove var.
Cardamine pratensis var. palustris to C. dentata
Leiophyllum buxifolium to Kalmia buxifolia
Calamagrostis inexpansa ssp. stricta to C. stricta

Field Taxa

Asplenium quadrivalens, split from A. trichomanes?
Mostly just making people aware that there might be two taxa, and encouraging good observations and specimen collections. I have highlighted what seems to be the most useful field character; lots of relative characters and "mostly", "often", "rarely" -type statements, but maybe if one gets a feel for them and uses a suite of characters for identification, one might be convinced they are distinct, and can maybe provide ranges to replace things like "thicker vs thinner".

Key from Weakley:

8 Sori 4-9 (-12) per pinna, up to 3 mm long; rhizome scales up to 5 mm long; petiole relatively thicker, blackish-brown; pinnae mostly opposite, oblong, spaced more closely, thicker in texture, set at a nearly right angle to the rachis, rarely at all auriculate; spores mostly 34-43 µ long; stomate guard cells mostly 41-49 µ long; [of calcareous rocks]
.....*Asplenium quadrivalens*
8 Sori 4-6 (-9) per pinna, up to 2 mm long; rhizome scales up to 3 mm long; petiole relatively thin, shiny, coppery or bronze; pinnae mostly alternate, suborbicular, spaced more distantly, thinner in texture, set at a fairly oblique angle to the rachis, often slightly auriculate on the side of the pinna toward the leaf base; spores mostly 29-36 µ long; stomate guard cells mostly 38-43 µ long; [mostly of noncalcareous rocks]**..... *Asplenium trichomanes***

Swida foemina (≡ Cornus foemina)
Key from Weakley

7 Multiple stems from a single rootstock (occasionally appearing rhizomatous from decumbent stems); lenticels not protruding, bark swelling between lenticels; fruit blue ..... **Swida foemina**

7 Rhizomatous, forming large colonies; lenticels protrude slightly, older stems appear verrucose; fruit white ..... **Swida racemosa**

Six specimens from Pennsylvania come up on a SEINet search. Some have original dets as names currently treated in the synonymy of S. foemina s.str. At least two seem to be C. racemosa, which has been treated as a variety of foemina in the past, and maybe they are all racemose. Not appearing from that search is a Canby collection from Bucks County, labeled and filed under Cornus candidissima Marsh., non-Mill. (an illegitimate name that refers to Cornus foemina according to Kartesz (DOV0017293), which seems to be the voucher on which Kartesz bases the inclusion of Pennsylvania in

the range of this species. It looks consistent with the bark characters in the key above, but this is difficult to interpret from a scan, especially without direct experience distinguishing between these. Please do what you can to help us determine whether or not this species is part of the Pennsylvania flora.

Erigeron pusillus (≡E. canadensis var. pusillus ≡ Conyza canadensis var. pusillus)
5 Stem coarsely spreading-hirsute; leaves ciliate, the larger generally with a few to many coarse teeth; phyllaries green-tipped or white-tipped ..... ***..... Erigeron canadensis***
5 Stem glabrous or with widely scattered, appressed hairs; leaves with a few cilia toward the base, generally entire; phyllaries purple-tipped..... ***..... Erigeron pusillus***

Rosa carolina ssp. subserrulata
20 Fertile branches armed with straight, thin or rarely stout, circular or somewhat flattened infrastipular prickles, lacking internodal prickles or aciculi (or if these present , few and scattered); stems mostly thin, pendent or upright; hypanthia (later hips) and pedicels stipitate-glandular (rarely eglandular)
..... Rosa carolina ssp. carolina
20 Fertile branches armed with straight, thin or often stout, circular or flattened infrastipular prickles, with internodal prickles of small prickles, aciculi, or stipitate glands, usually densely covering branches and adjacent stems; stems mostly thick, or upright; hypanthia (later hips) and pedicels stipitate-glandular or eglandular ***..... Rosa carolina ssp. subserrulata***

Perhaps the shale barren form

Persicaria densiflora (= the North American representatives of P. glabra s. l.)
12 Ocreae lacking cilia or with cilia 0-1 mm long.
13 Plants perennial, with rhizomes or stolons; leaves lacking a triangular reddish blotch in the middle of the upper surface; achenes biconvex; styles 2; leaf base cuneate; ocreae 12-23 mm long…….. ***Persicaria densiflora***
13 Plants annual, lacking rhizomes or stolons; leaves often with a triangular reddish blotch in the middle of the upper surface (except for in *P. minor*); achenes triangular in ×-section; styles 3; leaf base rounded to cordate; ocreae 6-12 mm long***..... Persicaria hirsuta***

Sanicula canadensis var. grandis
7 Largest leaflet of basal and lower stem leaves < 8 cm long and < 4 cm wide; triads of fruits 7- (mean 8) -9 mm across; plants to 1 m tall; [widespread in distribution] ***..... Sanicula canadensis var. canadensis***
7 Largest leaflet of basal and lower stem leaves both 5.5- (mean 8.5) - 13.5 cm long (mean 8.5) and also 2.5- (mean 3.5) - 6.0 cm wide; triads of fruits 8- (mean 10) -15 mm across; plants to 2 m tall; [mainly northern and montane in distribution] ***..... Sanicula canadensis var. grandis***
(also keys out under the first lead of the first couplet of the key, unlike other S. canadensis varieties)

Carex leptalea var. harperi
1 Perigynia 3.4-4.9 (-5.4) mm long; pistillate scales whitish***..... Carex leptalea var. harperi***
1 Perigynia 2.5-3.5 mm long; pistillate scales pale brown, with green midrib
..... Carex leptalea var. leptalea

Carex intumescens var. fernaldii
The characters used in the recent Weakley floras (incl. 2020 and 2022) don't work to distinguish these varieties. Achene characters should not be used. The following key from Medford et al. 2021 works well to distinguish them.

Medford H.C., Poindexter D.B., and Weakley A.S. 2021. Studies in the vascular flora of the southeastern United States VII. Journal of the Botanical Research Institute of Texas 15(1):24-32. https://journals.brit.org/jbrit/article/download/1049/1087

1. Perigynium length/width ratio (2.8–)3.0–4.5; perigynia 2.9–3.0(–4.3) mm wide; maximum number (on a plant) of perigynia per pistillate spike 2–7(–8); perigynium scale length 3.9–5.8(–6.0) mm; [widespread in the northern US and adjacent Canada, but southwards of New York restricted to moist (but not wetland) high elevation habitats such as spruce-fir forests]..... ***Carex intumescens* var*. fernaldii***
1. Perigynium length/width ratio 1.8–2.9(–3.9); perigynia (2.9–)4.0–6.0 mm wide; maximum number (on a plant) of perigynia per pistillate spike (3) 6–17; perigynium scale length (4.0–)5.0–12.5 mm; [widely distributed in wetlands throughout eastern North America***.....Carex intumescens* var*. intumescens***

Carex tetanica var. canbyi
Mentioned but not keyed in Weakley

New Calystegia/Convolvulus spp.
Calystegia sepium ssp. appalachiana
Calystegia sepium ssp. erratica
Calystegia sepium ssp. americanus

12 Bracteoles forming a continuous spiral series with sepals, the flower appearing to have 3 bracteoles when seen from side; leaves with almost closed sinus, the lobes posteriorly truncate
..... Convolvulus species 3 [=erratica]
12 Bracteoles clearly distinct from sepals, obviously only 2; leaves with a wide or v-shaped sinus.
13 Corolla pink.
14 Leaves with basal lobes rounded or with a single angle, or if with 2 angles then not spreading; plant glabrous or commonly pubescent to tomentose on stem ***..... Convolvulus americanus***
14 Leaves with lobes with 2 angles, spreading; plant glabrous ***... Convolvulus species 2 [=appalachianus]***
13 Corolla white. 15 Corolla 35-50 mm long; stamens 17-25 mm long; leaf sinus acute (V-shaped); plant glabrous ***..... Convolvulus sepium***
15 Corolla 48-70 mm long; stamens 25-32 mm long; leaf sinus acute or rounded (U-shaped); plant glabrous or pubescent.
16 Leaves with spreading basal lobes, each lobe more or less 2-angled, sinus broadly rounded; plant glabrous; WV and northwards and westwards] ***..... Convolvulus species 4 [=angulatus]***

Celastrus scandens
Seems to be declining, probably at least in part due to genetic swamping from the invasive C. orbiculatus

Vitis spp
Jack Holt expressed concern for all native Vitis spp due to impact of spotted lanternflies

Epilobium palustre
Has been an identification challenge. Emphasis in keys on *E. palustre* being glabrous has led to under-identification of this taxon. We pulled together some published information and our own observations to attempt a more detailed key. Please test, compare to any material you can find, let us know how it holds up!

Revised key couplet for *E. palustre* vs. *E. leptophyllum*

Leaves evenly narrowed to a sharp tip (acute) throughout; plant usually with many branches, leaves, and flowers, giving a dense appearance, especially in the upper portion of the plant, which tends towards invert-triangular in profile due to branching+; inflorescences consistently erect in bud; plant uniformly densely (rarely moderately) covered in minute fine short curved hairs, on both leaf blade surfaces and on stems ……***Epilobium leptophyllum***.

Lower leaves with rounded tips; upper stem leaves with acute (sometimes rounded) tips*. Plants unbranched or sparsely branched, tending towards simple and linear in profile; leaves and flowers fewer and less densely arranged. Inflorescences usually nodding in bud (best seen in life). Leaf and stem pubescence variable, from almost entirely glabrous to moderately dense fine minute curved hairs; often variable between leaves of a single plant. Adaxial leaf surface tends to have less pubescence than abaxial leaf surface ……. ***Epilobium palustre***

*Character holds regardless of leaf shape and width, which can be quite variable in *E. palustre*, from wide and somewhat lanceolate to narrowly linear.

+ there is some overlap in this character. Widely triangular plants are always *E. leptophyllum*, but it can range to be near-linear in profile (though will still have denser leaf arrangement and many axillary fascicles). *E. palustre* is most often linear in profile, but can range to narrowly triangular in profile, and will have less densely arranged leaves with fewer axillary fascicles.

Source material & methods:

This key draws on the following published information, and beyond the text below, is extrapolated for clarity based on our experience observing Carnegie Museum specimens of both species (both in PA and beyond).

FNA (author Peter Hoch):

Key:

Leaf blade surfaces strigillose abaxially, subglabrous adaxially, with strigillose margins and veins; inflorescences nodding in bud.	Epilobium palustre
Leaf blade surfaces densely strigillose on both sides; inflorescences erect in bud.	Epilobium leptophyllum

FNA description for *E. palustre* says “apex obtuse proximally to acute distally“ while for *E. leptophyllum* says “leaf apexes acute or acuminate.” In our observation, these should be switched; *E. palustre* specimens very reliably had obtuse apexes on lower leaves, while *E. leptophyllum* very reliably had acute apexes throughout.

Michigan flora, comments under *Epilobium leptophyllum:* Sometimes resembling *E. palustre* rather closely, but more generally pubescent with minute incurved hairs, and usually with more branches, leaves, and flowers.

Hybridization:

FNA comments indicate it is possible, and indeed observed occasionally, but not likely to be extremely prevalent.

E. leptophyllum comment:

> "Judging by the number of herbarium sheets that also include *E. palustre*, *E. densum*, and even *E. coloratum*, it sometimes occurs in sympatry with those species and may rarely hybridize with them, based on plants with intermediate morphology and/or sterile fruits."

Epilobium section Epilobium discussion:

> "Based on extensive crossing studies, it appears that virtually all species of sect. Epilobium can hybridize with most or all other species, resulting in more or less fertile offspring (S. R. Seavey and P. H. Raven 1977, 1977b, 1977c, 1978). Natural hybridization occurs fairly frequently where two or more species occur sympatrically in nature (Raven and T. E. Raven 1976). Analysis of experimental hybrids revealed the presence of reciprocal chromosome translocation differences within this section; species or groups of species have been found to differ from one another by one or more reciprocal translocations, resulting in rings or chains of chromosomes, rather than bivalents, in hybrids between the groups (Raven and Raven; Seavey and Raven 1977, 1977b, 1977d, 1978)"

Our observations of the Carnegie Museum specimens fit with this state of affairs; almost all of the specimens were reliably determinable considering the characters in the key above together, but 2-3 specimens were ambiguous due to intermediate forms of the characters, ie, a combination of moderate pubescence, moderate branching and leaf density, and a few rounded leaf tips in the lower part of the plant while most (including some in lower part of plant) are acute.

Symphyotrichum dumosum varieties:

Character	*Var. dumosum*	*Var. strictior*
Bract shape	Obtuse to obtuse-with-mucro; oblong	Acute, lanceolate to oblanceolate
Bract size	Small	Larger
Bract arrangement	Mostly uniform in size along branches	Proximal bracts notably larger than distal bracts
Inflorescence shape	Irregular in shape, with many perpendicular branches; heads diffuse due to length and spread of branches	Generally pyramidal, with ascending branches. Heads crowed, especially distally, due to convergence of branches.

We could possibly also have var. *subulifolium*, which has been documented in New Jersey. Var. *subulifolium* has acute-tipped bracts, and per the type specimen appears to be a much rangier plant than *strictior*, with bracts that tend to be smaller and more uniform in size than those of var. *strictior.*

Type collections:

Var. strictior: https://sweetgum.nybg.org/images3/512/026/00158805.jpg

Var. subulifolium: https://s3.amazonaws.com/herbaria2/GPI-Types/HUHGPI0073/Asteraceae/full/full_GH00872292.jpg

Quercus shumardii

Table based on FNA key and species description. Of PA Quercus, only *Q, rubra* and *Q. shumardii* have 7-9 lobes per leaf.

Quercus shumardii	***Quercus rubra***
Bark shallowly ridged with pink furrows, typically less well defined upwards on tree. Large-diameter trees have bark resembling *Q. rubra* on lower trunks, but upper trunks have shallower furrows with pink color.	Deeply ridged with grey to orange furrows, typically very well-defined ridges and furrows
Buds light grey to grey-brown, fairly uniform in color, and hairless. Almost waxy in appearance.	Buds red-brown, often with distinct color variation within scales such that individual scales are vividly distinct; sometimes hairy near tip.
Leaf sinuses usually extending more than 1/2 distance to midrib	Leaf sinuses usually extending less than 1/2 distance to midrib
Leaves extremely shiny on top surface. Stop you in your tracks shiny.	Leaves dull on top surface.
Leaves columnar-obovate: upper lobes larger than lower lobes; widest point on leaves 1/8-1/3 down from tip. Upper lobes tend to be distally expanded with many teeth, even approaching compound lobing (I observed usually 4-7 points in PA specimens).	Leaves ovate-triangular: largest lobes near base of leaf, reducing in size upwards; widest point on leaves 1/3-1/2 of the way down from the tip. Upper lobes reduce in size distally with few teeth. (I observed 3-5 on PA specimens)
Leaves with sinuses tending to angle straight out, with sides parallel, sometimes lobe tips closing back towards each other at the distal end to form an oval shape.	Leaves with sinuses angled upwards, with distal end wider, forming a wedge shape.

left: very shiny Shumard leaves

right: QS shallowly ridged with pink inner

Below Left - Shumard leaves are columnar/obovate: widest in the top third; sinuses close back around at distal end; largest lobes are nearly compound.

Below Right – Red oak leaves are ovate/triangular: widest in lower half, sinuses are wedge-shaped and clearly wider at distal end, lobes are not compound. Note that these sun leaves have quite deep sinuses and would key to Shumard based on that character alone.