

**Addenda to *Flora Novae Angliae***  
**compiled by Arthur Haines with the assistance of the botanical community**

➤ Phylogenetic study indicates that the genus *Consolida* (Ranunculaceae) is nested within *Delphinium* (Jabbour and Renner 2012). Therefore, New England species previously placed in the genus *Consolida* need to be referred to by the following names:

*Delphinium ajacis* L. (doubtful larkspur)  
*Delphinium consolida* L. (royal larkspur)  
*Delphinium orientale* J. Gay (Oriental larkspur)

Jabbour, F., and S.S. Renner. 2012. A phylogeny of Delphinieae (Ranunculaceae) shows that *Aconitum* is nested within *Delphinium* and that Late Miocene transitions to long life cycles in the Himalayas and Southwest China coincide with bursts in diversification. *Molecular Phylogenetics and Evolution* 62: 928–942.

➤ *Diplazium pycnocarpum* (narrow-leaved glade fern, Athyriaceae) is now referred to as *Homalosorus pycnocarpus* (Spreng.) Pichi Sermolli based on the work of Wei et al. (2010) and summarized in Rothfels et al. (2012).

Wei, R., X.-C. Zhang, and X.-P. Qi. 2010. Phylogeny of *Diplaziopsis* and *Homalosorus* based on two chloroplast DNA sequences: rbcL and rps4+rps4-trnS IGS. *Acta Botanica Yunnanica* 17: 46–54.

Rothfels, C.J., M.A. Sundue, L.-Y. Kuo, A. Larsson, M. Kato, E. Schuettpelz, and K.M. Pryer. 2012. A revised family-level classification for eupolypod II ferns (Polypodiidae: Polypodiales). *Taxon* 61: 515–533.

➤ *Persicaria extremiorientalis* (Vorosch.) Tzvelev (far-eastern smartweed, Polygonaceae) has been collected in CT (NEBC) and MA (NY). This annual species often has arching to nodding inflorescences (15–)30–80 mm long borne on stipitate-glandular peduncles, a pilose lower and middle stem, and lanceolate to broad-lanceolate leaf blades 10–70 mm wide. It is included in the existing identification keys with the follow edits (note bolded text):

- 18a.** Leaf blades ovate, 3–16 cm wide; sheathing stipules horizontally divergent at the summit creating a conspicuous flange ..... *P. orientalis*  
**18b.** Leaf blades narrow-lanceolate to elliptic, oblanceolate, **or broad-lanceolate**, 1–3 (–7) cm wide; sheathing stipules without a horizontally spreading summit  
**19a.** Upper portion of the stem and peduncles stipitate-glandular;  
inflorescence 3–10 cm long, lax or drooping [study specimens to see if this requires editing]  
**20a.** Leaves with **narrow-lanceolate to lanceolate blades 10-35 mm wide and petioles (1–)5–15 mm long; upper stems stipitate-glandular** ..... *P. careyi*  
**20b.** Leaves with **lanceolate to broad-lanceolate blades 10-70 mm wide and petioles 10–30 mm long; upper stems pubescent but not stipitate-glandular**  
..... (in part) *P. extremiorientalis*

**19b.** Upper portion of the stem and peduncles without stipitate glands; inflorescence 1–4.5 (–6.5) cm long, commonly erect to ascending

**21a.** Sheathing stipules long-ciliate with marginal hairs (3–) 4–12 mm long; bracteoles of the flowers long-ciliate with marginal hairs (0.5–) 1–4 (–6) mm long; achenes trigonous

..... *P. longiseta*

**21b.** Sheathing stipules ciliate with marginal hairs (0.3–) 1–3.5 (–5) mm long [Fig. 793]; bracteoles of the flowers short-ciliate with marginal hairs (0.1–) 0.2–2 (–2.7) mm long; achenes biconvex or both biconvex and trigonous in the same inflorescence

**22a.** Inflorescence loose and usually interrupted in the basal

portion, 2–4 mm wide; leaf blades linear to narrow-lanceolate, (2–) 4–10 (–23) mm wide .....

*P. minor*

**22b.** Inflorescence dense, usually uninterrupted, 4–12 mm wide; leaf blades lanceolate to narrow-ovate, (2–) 10–25 (–40) mm wide

**23a. Lower and middle portions of stems usually pilose; cilia along leaf margin 0.5–1.1 mm long; inflorescences (15–)30–80 mm long; achenes usually lenticular**

..... (in part) *P. extremiorientalis*

**23b. Lower and middle portions of stems usually glabrous or appressed-pubescent; cilia along leaf margin 0.2–0.5 mm long; inflorescences 10–45(–60) mm long; achenes lenticular or trigonous**

**22a.** Inflorescence 6–12 mm wide, obloid to short-cylindrical; tepals 2–3 mm long at anthesis, enlarging in fruit and then up to 4 mm long, prominently, but minutely, patterned with a raised reticulum near the base; leaf blades commonly with a purple blotch on the adaxial surface [Fig. 793] .....

*P. maculosa*

**22b.** Inflorescence 4–7 mm wide, cylindrical to subconical; tepals 1.8–2 mm long at anthesis, enlarging in fruit and then up to 2.6 mm long, faintly reticulate-patterned, if at all, near the base; leaf blades usually unblotched

..... *P. puritanorum*

The following synonyms apply to this species: *Persicaria maculosa* S.F. Gray ssp. *hirticaulis* (Danser) S. Ekman & T. Knutsson; *Persicaria mitis* Gilib. var. *hirticaulis* (Danser) H. Hara & I. Ito; *Polygonum extremiorientale* Vorosch.; *Polygonum persicaria* L. ssp. *hirticaulis* Danser; *Polygonum persicaria* L. var. *pubescens* Makino

Atha, D.E., M.H. Nee, and R.F.C. Naczi. 2010. *Persicaria extremiorientalis* (Polygonaceae) is established in the flora of the eastern United States of America. *Journal of the Torrey Botanical Society* 137: 333–338.

 *Atriplex cristata* (seabeach orache, Amaranthaceae) is now referred to as *Atriplex mucronata* Raf. Discussion of this change can be found in Welsh (2003).

Welsh, S.L. 2003. *Atriplex*. Pages 322–381 in *Flora of North America* Editorial Committee, editors. *Flora of North America*, volume 4. Oxford University Press, New York, NY.

➤ *Polygala paucifolia* (Polygalaceae) has been segregated from the remainder of the genus and placed in *Polygaloides* as described in Abbot (2011). The correct name for this species is now *Polygaloides paucifolia* (Willd.) J.R. Abbott (fringed false milkwort).

Abbot, J.R. 2011. Notes on the disintegration of *Polygala* (Polygalaceae), with four new genera for the flora of North America. *Journal of the Botanical Research Institute of Texas* 5: 125–137.

➤ The plant known in New England as *Landoltia punctata* (G.F.W. Mey.) D.H. Les & D.J. Crawford (Araceae) has been shown to belong to a species properly known as *Spirodela oligorrhiza* (Kurz) Hegelmaier (spotted duckmeal), as discussed by Ward (2011).

Ward, D.B. 2011. *Spirodela oligorrhiza* (Lemnaceae) is the correct name for the lesser greater duckweed. *Journal of the Botanical Research Institute of Texas* 5: 197–203.

➤ The aquatic fern called *Azolla caroliniana* (Carolina mosquito fern, Azollaceae) in New England is now properly referred to as *Azolla cristata* Mett., a change that was necessitated because the type specimen of *Azolla caroliniana* was determined to be conspecific with the previously described *Azolla filiculoides* (Evrard and Van Hove 2004). Therefore, New England plants required another name.

Evrard, C., and C. Van Hove. 2004. Taxonomy of American *Azolla* species (Azollaceae): a critical review. *Systematics and Geography of Plants* 74: 301–318.

➤ Plants called *Euphorbia dentata* (toothed spurge, Euphorbiaceae) collected from New England have been determined to be (at least in large part) *Euphorbia davidii* Subils (David's spurge), as briefly summarized in Peirson et al. (2016). While *Euphorbia dentata* is native to much of the southern United States and Great Lakes region, *Euphorbia davidii* is non-native to this continent. The two species are separated as follows:

- 1a.** Leaf blades usually widest at the middle, narrow-elliptic to broad-elliptic; midstem leaves with petioles often nearly as long as the blade; hairs on abaxial leaf blade surface stiff, strongly tapered, and with a broad basal cell; capsules 4–4.8 mm long; seeds angular in transection, unevenly tuberculate, 2.2–2.9 mm wide ..... *E. davidii*
- 1b.** Leaf blades usually widest below the middle, lanceolate to trullate; midstem leaves with petioles not usually more than 1/3 as long as the blade; hairs on abaxial leaf blade surface weak, filiform, and without a broad basal cell; capsules 3.5–4 mm long; seeds rounded in transection, evenly tuberculate, 1.7–2.1 mm wide ..... *E. dentata*

Peirson, J.A., P.E. Berry, and V.W. Steinmann. 2016. *Euphorbia* section *Poinsettia*. Pages 317–324 in *Flora of North America* Editorial Committee, editors. *Flora of North America*, volume 12. Oxford University Press, New York, NY.

Currently, *Euphorbia davidii* is known from CT, MA, NH, VT and *E. dentata* is known from CT, VT.

➤ The nothospecific epithet of *Fragaria ×ananassa* (Rosaceae) was misspelled in the *Flora Novae Angliae* manual (it was spelled as “*ananasa*”).

➤ The plant called *Chamaerion angustifolium* (narrow-leaved fireweed, Onagraceae) has had a change to its genus name based on the nomenclatural research of Sennikov (2011). It is now called:

*Chamaenerion angustifolium* (L.) Scop. ssp. *circumvagum* (Mosquin) Moldenke

Sennikov, A.N. 2011. *Chamerion* or *Chamaenerion* (Onagraceae)? The old story in new words. *Taxon* 60: 1485–1488.

➤ The genus *Sibbaldiopsis* (Rosaceae) has been included within the genus *Sibbaldia* based on the work of Paule and Soják (2002). The correct name for our species formerly called *Potentilla tridentata* and *Sibbaldiopsis tridentata* is now:

*Sibbaldia tridentata* (Ait.) Paule & Soják (three-toothed-cinquefoil)

Paule, J., and J. Soják. 2009. Taxonomic comments on the genus *Sibbaldiopsis* Rydb. *Journal of the National Museum (Prague), Natural History Series* Vol. 178: 15–16.

➤ *Chasmanthium latifolium* (Indian wood-oats, Poaceae) has been collected as a naturalized plant in MA (NEBC). It was found on the shoreline of a pond away from cultivation. It will key to Group 4 of the Poaceae key to the genera. The following couplet can be inserted in front of the existing couplet 23 to key to this genus.

- 23a.** Spiklets (15–)20–40 mm long; florets with 1 anther ..... *Chasmanthium*  
**23b.** Spikelets 2.7–15.5(–20) mm long; florets with 3 anthers (with 1 anther in *Vulpia*, but that genus with prominently awned lemmas

➤ *Lycopus exaltatus* L.f. (high water-horehound, Lamiaceae) was collected in eastern MA in 1896 (GH). To identify this species, a new couplet 1 must be inserted in front of the existing couplet 1 of the *Lycopus* key to the species.

- 1a.** Bracts within verticillasters 6–9 mm long; leaf blades prominently lobed with 3–5 pairs of long, linear lobes near the base, the sinuses sometimes extending nearly to the midrib  
..... *L. exaltatus*  
**1b.** Bracts within verticillasters 0.6–5 mm long; leaf blades toothed to pinnately lobed, but the sinuses rarely extending more than 2/3 the distance from the margin to the midrib (except in rare individuals of *L. americanus*, but that species with mericarps 1–1.3(–1.4) × (0.6–)0.7–1 mm vs. 1.3–1.8 × 0.9–1.3 mm in *L. exaltatus*).

➤ A new generic concept has been proposed for *Piptatherum* (Poaceae), with our species listed in the flora now placed in either *Patis* or *Piptatheropsis*. A key to these genera is below that would replace the current couplets where *Oryzopsis* and *Piptatherum* occur in the Poaceae key to the genera.

- a. Lemmas dark brown to nearly black; leaves with minute ligules or none, the uppermost blades flat, 8–15 mm wide, longer than (10–)12 cm; glumes 5- to 9-veined, with faint cross-veinlets ..... ***Patis***
- b. Lemmas pale green, gray, or pale brown; leaves with ligules, those of the upper leaves 1.5–3 mm long, the uppermost blades involute, 1–2 mm wide, shorter than 10(–12) cm; glumes 1- to 5- veined, without cross-veinlets
  - aa. Panicle open to somewhat congested, the branches spreading to ascending, each branch bearing usually 2 or more spikelets; uppermost leaf blades well-developed, 1–35 cm long; basal leaves deciduous; flowers with 2 styles; callus of lemma pubescent with hairs 0.1–0.5 mm long ..... (in part) ***Piptatheropsis***
  - bb. Panicle very narrow, raceme-like, with appressed branches, each branch bearing usually a single spikelet; uppermost leaf blades absent or with a blade shorter than 1 cm; basal leaves wintergreen; flowers with 1 style; callus of lemma pubescent with hairs 1–1.5 mm long ..... (in part) ***Oryzopsis***

*Patis racemosa* (Sm.) Romasch., P.M. Peterson & Soreng (black-seeded-rice grass)

*Piptatheropsis canadensis* (Poir.) Romasch., P.M. Peterson & Soreng (Canada mountain-rice grass)

*Piptatheropsis pungens* (Torr.) Romasch., P.M. Peterson & Soreng (short-awned mountain-rice grass)

Romaschenko, K., P.M. Peterson, R.J. Soreng, O. Futorna, and A. Susanna. 2011. Phylogenetics of *Piptatherum* s.l. (Poaceae: Stipeae): Evidence for a new genus, *Piptatheropsis*, and resurrection of *Patis*. *Taxon* 60: 1703–1716.

 The genus *Onosmodium* (Boraginaceae) has been transferred to the genus *Lithospermum* based on the work of Cohen and Davis (2009) and Weigand et al. (2009). In brief, it has been determined that recognition of *Onosmodium* and other New World genera produces a non-monophyletic *Lithospermum*. Including these genera within *Lithospermum* remedies this. Therefore, our species in New England are now referred to by the following names:

*Lithospermum occidentale* (Mack.) Weakley, Witsell & D. Estes (western gromwell)

*Lithospermum virginianum* L. (eastern gromwell)

Cohen, J.I., and J.I. Davis. 2009. Nomenclatural changes in *Lithospermum* (Boraginaceae) and related taxa following a reassessment of phylogenetic relationships. *Brittonia* 61: 101–111.

Weigand, M., 2009. Marbleseeds are gromwells—systematics and evolution of *Lithospermum* and allies (Boraginaceae tribe Lithospermeae) based on molecular and morphological data. *Molecular Phylogenetics and Evolution* 52: 755–768.

➤ *Trichomanes intricatum* (Appalachian matted filmy fern, Hymenophyllaceae) has been transferred to the genus *Crepidomanes*, as *C. intricatum* (Farrar) Ebihara & Weakley, based on the work of Ebihara et al. (2008) and summarized in Weakley et al. (2011).

Ebihara, A., D.R. Farrar, and M. Ito. 2008. The sporophyte-less filmy fern of eastern North America *Trichomanes intricatum* (Hymenophyllaceae) has the chloroplast genome of an Asian species. *American Journal of Botany* 95: 1645–1651.

Weakley, A.S., R.J. LeBlond, B.A., Sorrie, C.T. Witsell, L.D. Estes, K. Gandhi, K.G. Mathews, and A. Ebihara. 2011. New Combinations, rank changes, and nomenclatural and taxonomic comments in the vascular flora of the southeastern United States. *Journal of the Botanical Research Institute of Texas* 5: 437–455.

➤ The three subspecies of *Coleataenia longifolia* (Poaceae) that occur in New England are being regarded as species by several researchers (i.e., they are being elevated in rank). Given that substantive differences do occur, it makes sense to follow this approach. The correct names are:

*Coleataenia longifolia* (Torr.) Soreng subsp. *longifolia* (long-leaved redtop-panicgrass)  
*Coleataenia rigidula* (Bosc ex Nees) LeBlond subsp. *rigidula* (common redtop-panicgrass)  
*Coleataenia stipitata* (Torr.) LeBlond (stipitate redtop-panicgrass)

➤ Those species formerly placed in the genus *Leptochloa* (Poaceae) are now placed in one of two different genera in New England based on the work of Peterson et al. (2012): *Dinebra* and *Diplachne*. These two genera can be separated as follows:

- 1a.** Leaf sheaths sparsely to densely pubescent with pustulose-based hairs; ligules 0.6–3.2 mm long, truncate at apex; spikelets 2–4 mm long, with 2–5 (–6) florets ..... ***Dinebra***  
**1b.** Leaf sheaths glabrous or scabrous, but not pustulose-pubescent; ligules 2–8 mm long, attenuate at apex and becoming lacerate at maturity; spikelets 5–12 mm long, with 6–20 florets ..... ***Diplachne***

Additionally, research demonstrates that additional taxa should be recognized and some infraspecific taxa should be elevated to species status (see Weakley et al. 2011 for *Diplachne maritima*; discussed therein as *Leptochloa maritima*). The correct names are:

*Dinebra panicea* (Retz.) P.M. Peterson & N. Snow ssp. *mucronata* (Michx.) P.M. Peterson & N. Snow (needle viper grass)  
*Diplachne fascicularis* (Lam.) P. Beauv. (bearded beetle grass)  
*Diplachne maritima* Bickn. (salt-marsh beetle grass)  
*Diplachne uninervia* (J. Presl) Parodi (one-nerved beetle grass)

Existing identification keys in the flora will work for these taxa except that *Diplachne maritima* is recognized as distinct and requires a couplet to distinguish it. The key to the species of *Diplachne* is below.

- 1a.** Low, sprawling to prostrate plants 5–50(–60) cm tall; lemma awns (1–)2.5–5 mm long; lower glumes 2.5–3.5 mm long, upper glumes 4–7 mm long ..... ***D. maritima***
- 1b.** Ascending to erect plants (15–)25–110 cm tall; lemma mucronate or with awns 0.5–2.5 mm long; lower glumes 1–3 mm long; upper glumes 1.8–5 mm long
- 2a.** Uppermost leaf usually partly enclosing the inflorescence in the sheath, the blade usually exceeding the inflorescence; mature lemmas gray-white, usually with a dark spot in the basal portion, acute at the apex, with awns 0.5–2.5 mm long ..... ***D. fascicularis***
- 2b.** Uppermost leaf usually not partly enclosing the inflorescence (i.e., the inflorescence completely exerted), the blade usually not exceeding the inflorescence; mature lemmas light brown, dark-green, or gray, usually lacking a dark, basal spot, truncate to obtuse at the apex, mucronate ..... ***D. uninervia***

Peterson, P.M., K. Romaschenko, N. Snow, and G. Johnson. 2012. A molecular phylogeny of *Leptochloa* (Poaceae: Chloridoideae: Chlorideae). *Annals of Botany* 109: 1317–1329.

Weakley, A.S., R.J. LeBlond, B.A., Sorrie, C.T. Witsell, L.D. Estes, K. Gandhi, K.G. Mathews, and A. Ebihara. 2011. New Combinations, rank changes, and nomenclatural and taxonomic comments in the vascular flora of the southeastern United States. *Journal of the Botanical Research Institute of Texas* 5: 437–455.

 *Petunia* × *atkinsiana* D. Don ex W.H. Baxter (*Petunia axillaris* × *P. integrifolia*, Solanaceae) has been documented as naturalized in New England (currently known to be vouchered from VT). It is variable, and displays some character states of each parent (e.g., it can have the yellow anthers of *P. axillaris* or the blue to violet anthers of *P. integrifolia*, it can have the anthers inserted near the base of the corolla tube as in *P. integrifolia* or inserted near the middle of the corolla tube as in *P. axillaris*). Identification of the hybrid is best achieved through examination of the corolla tube, which will expand upward (i.e., the flowers are narrowly to broadly funnelform) and lacks the abaxial bulge present on the tube in *P. integrifolia*. The flowers in naturalized populations are usually white to pale pink (those of *P. integrifolia* are usually purple to light purple or pink-red).

 *Veronica hederifolia* (ivy-leaved speedwell, Plantaginaceae), as was spelled by Linnaeus in *Species Plantarum*, customarily has the specific epithet spelled as “*hederifolia*” today.

 *Sanguisorba* (Rosaceae) has been shown to be paraphyletic and additional genera need to be recognized (Kerr 2004). The following key will diagnose the genera that were formerly included in *Sanguisorba*.

The key to the genera of species formerly placed in the genus *Sanguisorba* follows.

- 1a.** Flowers bisexual or unisexual and then carpellate, with (1–)2 (–3) carpels, the bisexual ones with 12 or more stamens ..... ***Poterium***
- 1b.** Flowers all bisexual, with 1 carpel and 2 or 4 stamens
- 2a.** Leaflets pinnately lobed; flowers with green sepals and 2 stamens, plants annual or biennial ..... ***Poteridium***

**2b.** Leaflets merely toothed; flowers with white or purple to red-purple sepals and 4 stamens; plants perennial ..... ***Sanguisorba***

The following names are recognized within New England. Note that *Poteridium annuum* has been documented as naturalized in New England (currently known from MA) and has been included here in this discussion of *Sanguisorba* and its segregate genera.

- Poteridium annuum* (Nutt.) Spach (prairie-burnet)
- Poterium sanguisorba* L. ssp. *balearicum* (Bourg. ex Nyman) Stace (salad-burnet)
- Sanguisorba canadensis* L. (Canada burnet)
- Sanguisorba officinalis* L. (great burnet)

Kerr, M.S. 2004. A phylogenetic and biogeographic analysis of Sanguisorbeae (Rosaceae), with emphasis on the Pleistocene radiation of the high Andean Genus *Polylepis*. Ph.D. Thesis, University of Maryland.

 *Botrychium lunaria* (common moonwort, Ophioglossaceae) has been segregated into two species—*Botrychium lunaria* s.s. and *B. neolunaria* Stensvold and Farrar (New World moonwort). Both of these species occur in New England. This is based on the work of Stensvold and Farrar (2017). The two species are separated as follows:

- 1a.** Branches of sporophore wide-spreading; stalk of sporophore usually as long as or shorter than the fertile portion of sporophore; basal leaflets often stalked and +/- larger than and approximate to next apical pair, frequently touching them ..... ***B. lunaria***
- 1b.** Branches of sporophore strongly ascending; stalk of sporophore usually longer than fertile portion of sporophore; basal leaflets usually of +/- similar size as and remote from next apical pair ..... ***B. neolunaria***

With this advancement in our understanding of moonwort taxonomy, *Botrychium lunaria* is restricted to the coastal plain of ME and *B. neolunaria* is known from interior ME and VT.

Stensvold, M.C., and D.R. Farrar. 2017. Genetic diversity in the worldwide *Botrychium lunaria* (Ophioglossaceae) complex, with new species and new combinations. *Brittonia* 69: 148–175.

 In the discussion under *Nigella damiscaeana* (devil-in-the-bush, Ranunculaceae), it states that reports of *N. sativa* are based on collections of *N. damiscaeana*. This was only true in part, and a correctly identified voucher for *N. sativa* is known for CT (i.e., both species of *Nigella* have been collected as wild plants in CT).

 *Sagittaria montevidensis* subsp. *spongiosa* (spongy-leaved arrowhead, Alismataceae) is better recognized as a distinct species—*S. spatulata* (J.G. Sm.) Buch.—given its distinctive morphology, ecology, and distribution from the remainder of the *S. montevidensis* complex. It is very distinct from *S. montevidensis*, a perennial species native to South America with expanded, hastate to sagittate leaf blades, inflorescence with (1–)3–15 whorls of flower, the carpellate ones without a cycle of sterile stamens, and petals with a purple spot at the base (vs. *S. spatulata*, an

annual species native to eastern North America with small leaf blades usually lacking basal lobes, inflorescence with 1 or 2(–3) whorls of flowers, the carpellate ones with a cycle of sterile stamens, and petals without a purple spot at the base).

 *Erodium brachycarpum* (Godr.) Thellung (short-fruited stork's-bill, Geraniaceae) has been documented from wool waste in Worcester County, MA (specimen at CONN). This species has the following synonyms: *Erodium obtusiplicatum* (Maire, Weiller & Wilczek) J.T. Howell; *Erodium botrys* var. *brachycarpum* Godr.; *Erodium botrys* var. *obtusiplicatum* Maire, Weiller & Wilczek). It's inclusion in the key to the species of *Erodium* requires the following changes (in bold):

**2b.** Sepals 7–15 mm long; mericarps 7–11 mm long; carpel beaks (25–)50–113 mm long; bracts of umbel lanceolate to ovate or triangular

**3b.** Apical pits of mericarp bodies eglandular within, with **1 or 2 transverse** furrows below them (lacking furrows in *E. cygnorum*); umbel with 1–6 flowers

**5a.** Base of stem pubescent with eglandular hairs or sometimes glabrate (upper portion of stem glandular-pubescent); leaf blades ovate in outline, with usually 3 principal lobes; mericarp bodies without furrows below the apical pits ..... *E. cygnorum*

**5b.** Base of stem, as well as upper portion of stem, pubescent with glandular hairs; leaf blades oblong to ovate in outline, with usually 5 or more principal lobes; mericarp bodies with **1 or 2 furrows below the apical pits**

**6a.** Carpel beaks **90–120 mm long; mericarp bodies (8–)9–10(–11) mm long, with 2 transverse furrows below the apical pit; apical pit of mericarp body glabrous within; sepals 10–13 mm** ..... *E. botrys*

**6b.** Carpel beaks **65–90 mm long; mericarps (6–)7–8 mm long, with 1 transverse furrow below the apical pit; apical pit of mericarp body puberulent within; sepals 7–10 mm long**..... *E. brachycarpum*

 Two species of *Trifolium* (Fabaceae) have been documented from wool waste in Worcester County, MA: *Trifolium angustifolium* L. (narrow-leaved crimson clover) and *T. retusum* L. (teasel clover, synonym: *Trifolium parviflorum* Ehrh.). Both species are vouchered at CONN. Their inclusion in the existing *Trifolium* key involves the following edits (in bold):

**4b.** Flowers sessile or subsessile, the pedicels (when present) up to 0.5(–1) mm long; petals white to pink to purple

**6a.** Individual flowers subtended by bracteoles

**7a.** Basal connate portion of calyx uniformly glabrate or pubescent, not becoming obliquely inflated in fruit; flowers not resupinate (i.e., the banner petal uppermost)

**8a.** Inflorescences sessile; corolla longer than calyx; calyx teeth subequal in length ..... *T. glomeratum*

**8b.** At least the lower inflorescences borne on peduncles up to 30 mm long; corolla shorter than calyx; calyx teeth very unequal in length ..... *T. retusum*

**10b.** Corollas (6–)8–16 mm long, +/- as long as or longer than the calyx; leaflets of lower leaves obovate or obcordate to elliptic or oblanceolate, mostly 0.8–3 times as long as wide (**very narrow and 8–20 times as long as wide in *T. angustifolium* and *T. purpureum***)

**11b.** Corollas (6–) 8–25 mm long, definitely longer than the calyx (**shorter than to equalling calyx in *T. angustifolium***); inflorescences sessile or pedunculate

~~16a. Corollas 16–25 mm long; Leaflets linear to elliptic-oblong, 20–80 × (1–)2–5 mm, 8–20 times as long as wide ..... *T. purpureum*~~

**17a.** Corollas 16–25 mm long, definitely longer than the associated calyx; **calyx teeth very unequal, the lowest one +/- 2 times as long as the others** ..... *T. purpureum*

....**17b.** Corollas 10–12 mm long, not or only scarcely exceeding the calyx; **calyx teeth subequal** ..... *T. angustifolium*

~~16b. Corollas 5–12 mm long; Leaflets oblanceolate or elliptic to obovate or obcordate, 8–30 × 3–12 mm, 0.8–4 times as long as wide~~

 The specific epithet of *Triglochin palustris* (marsh arrow-grass, Juncaginaceae) was spelled as “*palustre*” in the flora, as was originally written by Linnaeus in *Species Plantarum*. However, it is considered correct today as “*palustris*” and should be changed to this in modern works.

 *Scutellaria lateriflora* (mad dog skullcap, Lamiaceae) was erroneously listed as a non-native species. This member of the mint family is native to New England.

 *Pistia stratiotes* L. (water-lettuce, Araceae) has been documented in New England (currently known from several counties in CT). It’s inclusion in the Araceae key to the genera requires the following new couplet one to be inserted before the existing couplets:

**1a.** Plants aquatic, with of a floating rosette of leaves that are each 2–15(–20) cm long, nearly truncate to rounded at the apex, with 5–13 prominent, nearly parallel veins, and densely pubescent with white hairs ..... *Pistia*

**1b.** Plants terrestrial or aquatic, in either case, the leaves not as above

 *Ophioglossum vulgatum* L. (southern adder’s-tongue fern, Ophioglossaceae) has been documented in CT. The following key distinguishes between our two species of this genus in the Ophioglossaceae.

**1a.** Trophophore blade lanceolate or broad-lanceolate to elliptic or narrow-ovate, dull in life, herbaceous, the base usually gradually tapering; plants usually found in the open (e.g., marshes, low fields, ditches) ..... *O. pusillum*

**1b.** Trophophore blade ovate to trullate, somewhat shiny in life, firm-herbaceous, the base abruptly tapering; plant usually found in partial or complete shade (e.g., swamps, floodplain forests) ..... *O. vulgatum*

 *Phragmites australis* (common reed, Poaceae) was noted to be both native and non-native; however, this was erroneous as it is entirely non-native in North America.

 Three species of *Hordeum* (Poaceae) have been documented on wool waste in southern ME (all documented at GH). They are:

*Hordeum euclaston* Steud. (Argentine barley)

*Hordeum flexuosum* Nees ex Steud. (zigzag barley)

*Hordeum parodii* Covas (Parodi's barley)

The inclusion of these non-native species in the *Hordeum* key to the species requires substantial reworking of the key. The new identification key follows.

- 1a.** Auricles well-developed, even on upper leaves, 1–8 mm long; lemmas of lateral spikelets 6–15 mm long excluding the awns
- 2a.** Central spikelets sessile, with lemmas 3 mm wide or wider, the lemma awns 30–180 mm long; anthers 6–10 mm long; leaf blades 5–15 mm wide; rachis of spike not disarticulating ..... *H. vulgare*
- 2b.** Central spikelets pedicellate, with lemmas 2 mm wide or narrower, the lemma awns 20–40 mm long; anthers 0.2–3.2 mm long; leaf blades 2–5 mm wide; rachis of spike disarticulating ..... *H. murinum*
- 1b.** Auricles absent; lemmas of lateral spikelets 2.5–6.5 mm long excluding the awns
- 3a.** Glumes of central spikelet setaceous throughout, not distinctly flattened near the base; plants perennial
- 4a.** Spikes usually arching or even nodding at maturity; lemma awns of central spikelets 11–90 mm long; glumes (17–)85 mm long ..... *H. jubatum*
- 4b.** Spikes erect at maturity; lemma awns of central spikelets 1.5–14 mm long; glumes 7–19 mm long
- 5a.** Central spikelets with glumes 9–19 mm long and lemma awns 4–14 mm long; lateral spikelets commonly staminate with lemmas, when well formed, mucronate or with awns up to 6 mm long; basal sheaths not disintegrating into abundant, persistent fibers ..... *H. brachyantherum*
- 5b.** Central spikelets with glumes 7–15 mm long and lemma awns 1.5–8 mm long; lateral spikelets rudimentary or staminate, with lemmas, when well formed, mucronate or with awns to 0.8 mm long; basal sheaths disintegrating into abundant, persistent fibers ..... *H. parodii*
- 3b.** Glumes of central spikelet distinctly flattened near the base; plants annual or perennial in *H. flexuosum*
- 6a.** Basal sheaths disintegrating into abundant, persistent fibers; central spikelets with glumes 5–9 mm long, with lemma awns 2–5 mm long; rachis of spike +/- compressed; anthers 1–2.5 mm long; plants perennial ..... *H. flexuosum*
- 6b.** Basal sheaths not disintegrating into abundant, persistent fibers; central spikelets with glumes 7–17 mm long, with lemma awns 3.5–11 mm long; rachis of spike +/- terete; anthers 0.3–1.5(–1.8) mm long; plants annual
- 7a.** Lemmas of lateral spikelets 2.5–5.7 excluding the awns, usually awned, the awns up to 1.8 mm long; glumes erect to ascending at maturity ..... *H. pusillum*
- 7b.** Lemmas of lateral spikelets 1.7–4.4 mm long, usually without awns; glumes somewhat spreading at maturity ..... *H. euclaston*

Two new species of *Oenothera* (Onagraceae) have been documented in New England. *Oenothera affinis* Camb. (long-flowered evening-primrose) was collected once in MA and is vouchered at GH. *Oenothera clelandii* W. Dietr., Raven & W.L. Wagner (Cleland's evening-primrose) has been recently collected in VT. Their inclusion in the identification key requires a new couplet 8 and 9 to be inserted in front of the existing ones.

- 8a.** Petals elliptic or ovate, usually acute at the apex; capsules 10-18 mm long; seeds both minutely pitted and dark brown ..... *O. clelandii*
- 8b.** Petals obovate to broad-obovate, emarginate to retuse at the apex (except in rare individuals of *O. parviflora*, which have linear petals); capsules (12-)15-43 mm long; seeds not as above, mostly not minutely pitted (except in *O. laciniata*, but then the seeds light brown)
- 9a.** Hypanthium tube 70–100 mm long; seeds vertically oriented within the capsule, inconspicuously marked and appearing smooth at low magnification, lacking angular faces ..... *O. affinis*
- 9b.** Hypanthium tube 12–55 mm long; seeds horizontally oriented with the capsule (vertical in *O. laciniata*), either pitted or with angular faces

Post et al. (2009) reported that there were multiple subspecies of *Ficaria verna* (fig-crowfoot, Ranunculaceae) that could be recognized in North America, similar to Europe (but see below). The appropriate names for subspecies they reported from New England are:

*Ficaria verna* Huds. ssp. *calthifolia* (Reichenb.) Nyman  
*Ficaria verna* Huds. ssp. *fertilis* (Lawralrée ex Laegaard) Stace  
*Ficaria verna* Huds. ssp. *verna*

A key to the identification of the subspecies follows.

- 1a.** Stems very short at anthesis, the leaves crowded in a basal rosette; achenes hirsute; basal sinus of leaf blades usually narrow ..... *Ficaria verna* ssp. *calthifolius* (Reichenb.) Nyman
- 1b.** Stems elongated at anthesis, the leaves not crowded in a basal rosette, some leaves borne on an aerial stem; achenes puberulent or not developing; basal sinus of leaf blades usually broad
- 2a.** Bulbils present in the leaf axils after flowering; achenes often not developing; petals (2–)3–3.6(–4.6) mm wide; flowers mostly 15–20 mm wide ..... *Ficaria verna* ssp. *verna*
- 2b.** Bulbils absent; achenes usually maturing; petals (3.8–)4–4.6(–5.4) mm wide; flowers mostly 20–30 mm wide ..... *Ficaria verna* ssp. *fertilis* (Lawralrée ex Laegaard) Stace

Note that there is an important nomenclatural change presented here. It was discovered by Laegaard (2001) that the type specimen of *Ficaria verna* has bulbils, meaning what was called *F. verna* subsp. *bulbifera* is now properly subsp. *verna*. For clarity, what was called *Ficaria verna* ssp. *fertilis* (with bulbils) is now ssp. *verna*, and what was recognized as subspecies *verna* (no bulbils) is now treated as ssp. *fertilis* (Lawralrée Laegaard) Stace.

Comment on this research: Post et al. (2009) reported that five subspecies could be accurately diagnosed in North America (three within New England). Careful study of herbarium specimens shows that this doesn't appear to be the case. Several combinations of character states, which are

contrary to what were reported by Post et al., can be observed in New England material (e.g., bulbils in the axils of leaves and well-developed achenes). Several collections have elongate bulbils (as described for subsp. *ficariiformis*, which is not reported for New England by the authors) but are otherwise typical of subsp. *fertilis*. Their box plots appear to be based on few and/or homogenous samples because it is easy to find New England specimens that demonstrate measurements outside of what they reported. Indeed, flower size measurements do not appear to be correlated with subspecific taxa. Unfortunately, none of the GH collections from New England are annotated by them, despite the fact they report reviewing collection from this herbarium. Further, they are rather obscure with some critical characteristics, using terms like “short” or “robust” rather than actual measurements. In light of these shortcomings, and the difficulty of sorting non-sequential collections, more study is needed before subspecies can be confidently recognized in New England.

Laegaard, S. 2001. Validation of *Ranunculus ficaria* L. ssp. *fertilis* Clapham ex Laegaard (Ranunculaceae). *Nordic Journal of Botany* 20: 525–526.

Post, A.R., W.A. Wall, A. Krings, and J.C. Neal. 2009. Introduced less celandine (*Ranunculus ficaria*, Ranunculaceae) and its putative subspecies in the United States: A morphometric analysis. *Journal of the Botanical Research Institute of Texas* 3: 193–209.

Stace. 2009. Eleven new combinations in the British Flora. *Watsonia* 27: 256–248.

 The genus *Mimulus* (Phrymaceae) has been segregated into monophyletic genera based on the work of Barker et al. (2012).

- 1a. Corolla largely blue, lacking hairs on the palate of the lower lip ..... *Mimulus*
- 1b. Corolla largely yellow, pubescent on palate of the lower lip
  - 2a. Pedicels 2–10 mm long; ovary with parietal placentation; capsule attenuate at apex; plants annual ..... *Diplocus*
  - 2b. Pedicels 10–80 mm long; ovary with axile placentation; capsule rounded to truncate at apex; plants perennial (rarely annual in *E. guttata*) ..... *Erythranthe*

Our species transferred to other genera are as follows:

- Diplacus brevipes* (Benth.) G.L. Nesom
- Erythranthe guttata* (Fisch. ex DC.) G.L. Nesom
- Erythranthe moschata* (Douglas ex Lindl.) G.L. Nesom

Barker, W.R., G.L. Nesom, P.M. Beardsley, and N.S. Fraga. 2012. A taxonomic conspectus of Phrymaceae: A narrowed circumscription for *Mimulus*, new and resurrected genera, and new names and combinations. *Phytoneuron* 2012-39: 1–60.

 *Cynosurus echinatus* L. (bristly dogtail grass, Poaceae) was collected from CT (specimen at NCBS). It was observed in a roadside setting. A key to distinguish the two species of *Cynosurus* found in New England follows.

**1a.** Panicles ovoid to subglobose; plants annual; lemmas of fertile spikelets with awns 5–18(–25) mm long ..... *Cynosurus echinatus*

**1b.** Panicles narrow-cylindrical; plants perennial; lemmas of fertile spikelets with awns 0–3 mm long ..... *Cynosurus cristatus*

 A specimen of *Blumenbachia insignis* Schrad. (electric shock plant, Loaceae) was collected as a waif in a mill yard in Worcester County, MA (the specimen is at GH). Its inclusion in the flora requires a few couplets to be inserted in the existing identification keys.

Key to the families, Group 6, insert a new couplet 23 in front of the existing one:

**23a.** Plants with stinging hairs; androecium consisting of two parts—pollen-bearing stamens, which are antepetalous, arranged in five groups, and (at least initially) positioned up under the strongly cucullate petals, and antesepalous, petaloid staminodes; fruit a 5-valved capsule with locules that are somewhat spirally twisted ..... (in part) **Loasaceae**

**23b.** Plants without stinging hairs; androecium not as above; fruit various, but not a capsule with spirally twisted locules

Loasaceae, Key to the genera:

**1a.** Petals white, strongly cucullate, concealing the young stamens; plants with stinging hairs; leaves pinnately to bipinnately compound; capsule globose ..... *Blumenbachia*

**1b.** Petals yellow, +/- plane, not concealing the stamens; plants without stinging hairs; leaves coarsely toothed; capsule cylindrical ..... *Mentzelia*

 The hybrid *Carex scoparia* × *C. straminea* (Cyperaceae) has been collected in MA (specimen at GH). From *C. scoparia* it can be identified apart by perigynia mostly wider than 2 mm (mostly 2–2.3 mm wide) with bodies elliptic to broad-elliptic. From *C. straminea* it can be separated by very short staminate bases (usually less than 2 mm) and perigynia bodies merely elliptic to broad-elliptic (not +/- orbicular).

 The hybrid *Carex scoparia* × *C. tinctoria* (Cyperaceae) has been collected in NH (specimen at GH). This species can be identified apart from *C. scoparia* by its apical, herbaceous portion of the leaf sheaths, which vary from obscurely to evidently minutely papillose, and the carpellate scales that have some red-brown coloration. From *C. tinctoria* it differs in its acuminate carpellate scales that are sometimes prolonged into a short awn and perigynia that are merely lanceolate (as opposed to wider).

 *Lythrum portula* (L.) D.A. Webb (spatula-leaved loosestrife, Lythraceae) has been discovered in New England, collected from CT and MA. Its inclusion in the flora requires the following changes to the key to the species of *Lythrum* (note bold text in 1b):

**1b.** Inflorescence composed of solitary or paired flowers in the axils of leaves; flowers with 4–6 stamens, mono- or dimorphic (with 12 stamens and trimorphic in *L. junceum*); petals **1–6 mm long or absent**; leaf blades **0.5–4 cm** long, usually 1 at each of the middle and upper nodes (regularly opposite in *L. lineare*)

- 3a.** Flowers with 12 stamens; hypanthium spotted with red near the base; petals 5–6 mm long ..... *L. junceum*
- 3b.** Flowers with 4–6 stamens; hypanthium without red spots; petals 0–5 mm long (up to 6 mm long in *L. alatum*)
- 4a.** Leaf blades obovate to spatulate, mostly 1.2–2 times as long as wide; petals ca. 1 mm long or absent [refine length], hypanthium 1–2 mm long ..... *L. portula*
- 4b.** Leaf blades linear to narrow-ovate, mostly 2.6–10 times as long as wide; petals 2–5 mm long; hypanthium 4–7 mm long

➤ *Potentilla bimundorum* Soják (stag-horn cinquefoil, Rosaceae) has been collected in eastern MA (originally determined as *P. multifida* L.). Its inclusion in the key requires minor edits to the existing 8b and 10a (see bolded text) of the *Potentilla* key to the species and the addition of a new couplet 11.

- 8b.** Styles 0.6–1.5 mm long, conic or columnar, shorter than to slightly longer than the mature ovary; petals (2.5–)4–7 mm long; filaments (0.5–)0.8–1.5 (–2.5) mm long; anthers 0.3–0.6 (–1.2) mm long
- 10a.** Lower leaves with 5–9 leaflets, these pinnately arranged or the upper 3 confluent and appearing subpalmately arranged [Fig. 848]; styles glandular at the base
- 11a.** Leaflets lobed, the sinuses extending ca.  $\frac{3}{4}$  the distance from the margin to the midrib; styles papillate-swollen in the basal  $\frac{1}{2}$  to  $\frac{3}{4}$ , 1–1.5 mm long; achenes ca. 1 mm long, smooth to faintly rugose ..... *P. litoralis*
- 11b.** Leaflets lobed, the sinuses extending nearly to the midrib (i.e., more than  $\frac{3}{4}$  the distance from the margin to the midrib); styles papillate-swollen at the very base, if at all, 0.8–0.9 mm long; achenes 1.3–1.5 mm long, rugose ..... *P. bimundorum*

➤ Two new *Oxalis* (Oxalidaceae) hybrids have been identified in New England. *Oxalis dillenii* × *O. stricta* has been collected in MA (specimen at NEBC) and is identified by its capsules and pedicels with coarse, septate hairs (indicative of *O. stricta*, seeds with faint pale ridge summits and laxly appressed hairs on the stems that mostly lack septa (indicative of *O. dillenii*). The stipules are present, but inconspicuous (intermediate between the two parents). *Oxalis dillenii* × *O. florida* has been collected in CT (specimen at CONN). It is identified by its stem pubescence similar to *O. florida*, but seeds with pale white ridges, stipules intermediate between the two parents (but well developed at some nodes), and capsules that are sparsely pubescent (though most dense on the angles), with hairs appressed near apex and retrorsely oriented near middle and base.

➤ *Lechea racemulosa* Michx. (oblong-fruited pinweed, Cistaceae) has been documented from southwestern CT (specimen at NCU). Its inclusion in the existing key to the species of *Lechea* requires some edits. The new key to the genus is provided below.

- 1a.** Outer 2 sepals as long as or longer than the inner 3 sepals [Fig. 586]
- 2a.** Pubescence of stem spreading; inner (i.e., wider) sepals with a prominent keel, glabrous except along the keel; seeds lustrous, bright brown to clear yellow, with nearly transparent endosperm, therefore, the embryo clearly visible ..... *L. mucronata*
- 2b.** Pubescence of stem appressed to ascending; inner sepals with a midrib but without a

prominent keel, pubescent [Fig. 586]; seeds dull, varying from light to dark brown, opaque and without a visible embryo or somewhat translucent with a visible, but not conspicuous, embryo in *L. tenuifolia*

**3a. Calyx slightly swollen and indurate at the base, the region discolored yellow; pedicels 1.5–3(–3.5) mm long in fruit; outer sepals shorter than to equaling length of inner sepals .....(in part) *L. racemulosa***

**3b. Calyx neither swollen nor indurate at the base, the region not discolored; pedicels 1–2 mm long in fruit; outer sepals often slightly longer than inner sepals, varying to +/- equal in length**

**4a.** Leaf blades mostly less than 9 times as long as wide, those of the basal shoots broad-elliptic to ovate, 2–4(–6) mm wide; capsules equaling or slightly exceeding the sepals, the summit of the fruit visible ..... *L. minor*

**4b.** Leaf blades mostly more than 10 times as long as wide, those of the basal shoots narrow-linear to linear, up to 0.5–1(–1.5) mm wide; capsules usually slightly shorter than and enclosed by the sepals ..... *L. tenuifolia*

**1b.** Outer 2 sepals up to 60% as long as the inner 3 sepals [Fig. 585]

**5a. Calyx slightly swollen and indurate at the base, the region discolored yellow; capsules ellipsoid to ovoid, usually slightly exerted from calyx .....(in part) *L. racemulosa***

**5b. Calyx neither swollen nor indurate at the base, the region not discolored; capsules globose to broadly ovoid or broadly ellipsoid, shorter than to equaling the calyx (rarely slightly longer than in *L. intermedia*)**

**4a.** Leaf blades pubescent across the abaxial surface, those of the basal shoots thick, dull, 1.5–3.5 mm wide; seeds light brown to brown, the endosperm somewhat translucent and the embryo visible ..... *L. maritima*

**4b.** Leaf blades usually pubescent abaxially on the midrib margins only, sometimes nearly glabrous, those of the basal shoots thinner, bright green, 0.7–2(–2.5) mm wide; seeds light brown to dark brown, opaque, the embryo not visible

**5a.** Seeds 1–3(–4) per capsule, compressed-ovoid, brown to dark brown, without an investing membrane; fruiting calyx obovoid, acutely tapering at the base; stem leaf blades with a hardened, yellow to brown, conical apiculus at the apex

..... *L. pulchella*

**5b.** Seeds 4–6 per capsule, with 3 faces, the outer face convex (i.e., the seeds shaped like sections of an orange), light brown to brown, irregularly covered by a thin, gray membrane that imparts a reticulate surface to seed; fruiting calyx subglobose, rounded at the base; stem leaf blades merely acute at the apex, without an apiculus

..... *L. intermedia*

 *Bassia hirsuta* (hairy spiral-smotherweed, Amaranthaceae) has been transferred to the genus *Spirobassia* based on the research of Kadereit and Freitage (2011). It is now called *Spirobassia hirsuta* (L.) Freitag & G. Kadereit, and edits are needed to the key to the genera of the Amaranthaceae to accommodate this change. The existing couplet 15 needs to be replaced with the following couplet.

**15a.** Three (rarely only 2) of the fruiting perianth segments with a conical (i.e., non-hooked) projection on the abaxial side; leaf blades semicircular in cross-section, linear in outline; axis of

inflorescence flexuous or spiraled in fruit ..... *Spirobassia*  
**15b.** Fruiting perianth segments each either with a curved spine on the abaxial surface [Fig. 327]  
 or with a prominent, transverse wing on the abaxial surface; leaf blades flat, linear to lanceolate  
 or narrow-elliptic; axis of inflorescence straight

Further, the aforementioned research also demonstrates that *Kochia scoparia* belongs to the  
 genus *Bassia*. This species is now called *B. scoparia* (L.) A.J. Schott, and a new *Bassia* key is  
 needed.

**1a.** Fruiting sepals with a prominent, transverse wing on the abaxial surface ..... *B. scoparia*  
**1b.** Fruiting sepals without a wing, with hooked spines on the abaxial surface [Fig. 327]  
 ..... *B. hysopifolia*

Kadereit, G., and H. Freitag. 2011. Molecular phylogeny of Camphorosmeae  
 (Camphorosmoideae, Chenopodiaceae): Implications for biogeography, evolution of C4-  
 photosynthesis and taxonomy. *Taxon* 60: 51–78.

 *Carex scoparia* var. *tessellata* (Dawnland sedge, Cyperaceae) has been shown by Lovit  
 and Haines (2012) to be a distinct species that is endemic to northeastern North America  
 (Hancock and Washington Counties, ME, and southwestern New Brunswick). It is now referred  
 to as *C. waponahkikensis* M. Lovit & A. Haines, and the following key will distinguish it from  
*C. scoparia*.

**1a.** Perigynia (2.5–)2.8–4 times as long as wide, lanceolate to narrow-elliptic; perigynium beak  
 at maturity light brown to brown and wingless in the apical 0–0.5 mm, exceeding the tip of the  
 associated subtending scale by (0.8–)1–2(–2.3) mm; inflorescence (18–)20–55 mm long  
 ..... *C. scoparia*  
**1b.** Perigynia 2–2.6 times as long as wide, elliptic; perigynium beak at maturity brown to dark  
 purple-brown and wingless in the apical 0.3–1.1 mm, exceeding the associated subtending scale  
 by 0.2–1.2 mm; inflorescence 14–26 mm long ..... *C. waponahkikensis*

Lovit, M., and A. Haines. 2012. A new name and status for *Carex scoparia* var. *tessellata*  
 (Cyperaceae). *Botanical Notes* 14: 1–5.

 The genus *Triadenum* has been shown to be nested within the genus *Hypericum*, based  
 on the phylogenetic research of Nürk et al. (2013). Therefore, our two species are now referred  
 to as:

*Hypericum fraseri* (Spach) Steud.  
*Hypericum virginicum* L.

Nürk, N.M, S. Madriñán, M.A. Carine, M.W. Chase, and F.R. Blattner. 2013. Molecular  
 phylogenetics and morphological evolution of St. John’s wort (*Hypericum*; Hypericaceae).  
*Molecular Phylogenetics and Evolution* 66: 1–16.

➤ The varieties of *Verbena urticifolia* (white vervain, Verbenaceae) found in New England (var. *leiocarpa* and var. *urticifolia*) have been found to lack morphological distinction given that pubescence type and density varies and is does not appear correlated with other characteristics (Nesom 1010). Therefore, var. *leiocarpa* is no longer recognized.

Nesom, G.L. 2010. Taxonomy of *Verbena urticifolia* (Verbenaceae) and its close relatives. *Phytoneuron* 14: 1–12.

➤ *Alchemilla filicaulis* Buser subsp. *vestita* (Buser) M.E. Bradshaw (thin-stemmed lady's-mantle, Rosaceae) has been collected on wool waste in MA. It's inclusion in the flora requires an identification key to the species of *Alchemilla* in New England.

- 1a.** leaf blades +/- orbicular, with (7–)9–11 lobes, each lobe with short, uniform teeth, the adaxial surface densely pubescent with spreading hairs ..... *A. monticola*  
**1b.** leaf blades +/- reniform, with 7(–9) lobes, each lobe with taller, somewhat uneven teeth, the adaxial surface variably pubescent, but often only sparsely pubescent and/or with hairs mainly confined to the folds ..... *A. filicaulis*

➤ *Nymphoides aquatica* (J.F. Gmel.) Kuntze (big floating-heart, Menyanthaceae) has been documented for eastern MA. Its inclusion in the flora requires the following edits to the existing key to the species of floating-heart (note bold text in 1b).

- 1a.** Corolla yellow, 20–25(–30) mm wide in life, the lobes short-fringed along part of the margin; flowers rarely replaced by spur-like roots; reproductive stem with a pair of opposite leaves subtending the umbel, sometimes extended beyond the umbel and producing additional inflorescences; fruit 12–25 mm long; seeds ciliate on the margin ..... *N. peltata*  
**1b.** Corolla white, 5–20 mm wide in life, the lobes not fringed on the margin; some flowers usually replaced by a cluster of spur-like roots [Fig. 725]; reproductive stem with a single, alternate leaf subtending the umbel; fruit 4–9 mm long; seeds not ciliate  
**2a. Corolla 5–8(–10) mm in diameter; seeds smooth (rarely ornamented with papillae); leaf blades (2–)3–7(–9) cm long, herbaceous, usually smooth on the abaxial surface; stems 0.5–1(–1.4) mm in diameter; calyx lobes during anthesis mostly 2–3 mm long** ..... *N. cordata*  
**2b. Corolla (8–)10–14(–20) mm in diameter; seeds ornamented with papillae (rarely smooth); leaf blades (3–)5–12(–20) cm long, coriaceous, usually punctate-roughened on the abaxial surface; stems (0.8–)1.3–2.5(–4) mm in diameter; calyx lobes during anthesis mostly 4bes during anthesis mostly 4–5 mm long** ..... *N. aquatica*

➤ Research reveals that our species of *Odontites* (Orobanchaceae) should be called *O. vulgaris* Moench based on morphological and chromosomal review. All *Odontites* yet sampled in North America are diploid (as is *O. vulgaris*) and not tetraploid (as is *O. vernus*; Moss 1983).

Moss, E.H. 1983. Flora of Alberta: A Manual of Flowering Plants, Conifer, Ferns and Fern Allies, 2<sup>nd</sup> edition. University of Toronto Press Inc., Toronto, Canada.

➤ Couplet 21 of the existing key to the genera of the Apiaceae needs to be edited because both *Angelica* and *Heracleum* have dilated leaf sheaths. The current couplet 35 would be deleted because the species of *Angelica* would be dealt with in the new couplet 22.

**21a.** Upper leaf sheaths dilated, wider than 10 mm [Fig. 350]; inflorescence with 15–150 primary branches

**22a.** Principal leaf blades once divided into 3 (rarely as many as 7) segments [Fig. 350], the segments again lobed and 5–30(–60) cm long; marginal flowers of umbel enlarged, zygomorphic, the outer petals often bifid ..... (in part) *Heracleum*

**22b.** Principal leaf blades 2 or 3 times pinnately compound, the ultimate segments 2–4(–7) cm long; marginal flowers of umbel not or only slightly enlarged, actinomorphic, the outer petals often entire ..... (in part) *Angelica*

**21b.** Upper leaf sheaths not dilated, narrower than 10 mm; inflorescences with 2–25(–30) primary branches

➤ *Gentiana cruciata* L. (star gentian, Gentianaceae) has been collected in northeastern MA (specimen at NEBC). Its inclusion in the existing gentian key requires a new couplet 1 to be inserted at the beginning of the key to the species.

**1a.** Corolla 20–25 mm long, with 4 lobes, open at anthesis; anthers distinct ..... *G. cruciata*

**1b.** Corolla 25–50 mm long, with 5 lobes, closed at anthesis; anthers connate

➤ *Citrullus colocynthis* (L.) Schrad. (colocynthis, Cucurbitaceae) has been collected in eastern MA. Its inclusion in the flora requires a key to the species of watermelon to be created.

**1a.** Herbage with pustulose-based, stiff hairs or scabrules; tendrils simple or sometimes bifid; pepos 4–7(–10) cm in diameter, the mesocarp pale-yellow to yellow-orange, bitter; plants perennial ..... *C. colocynthis*

**1b.** Herbage villous, the hairs not pustulose-based; tendrils bifid or trifid; pepos 12–35(–60) cm in diameter, the mesocarp red (rarely orange or yellow); plants annual ..... *C. lanatus*

It also requires a small edit to the first lead of couplet 6 of the Cucurbitaceae key to the genera to accommodate for different fruit colors (note bold text).

**6a.** Leaf blades pinnately lobed, the segments +/- round at the apex; fruit exocarp green with irregular white or green-white stripes, the mesocarp red (**rarely pale-yellow to orange**)

..... *Citrullus*

➤ *Capsicum annuum* L. var. *glabriusculum* (Dunal) Heiser & Pickersgill (cayenne pepper, Solanaceae) has been collected in several counties within CT. Its inclusion in the flora requires edits to the key to the genera of the Solanaceae to accommodate the genus *Capsicum* (note bolded text).

**1b.** Inflorescence consisting of solitary flowers in the axils of leaves (rarely in pairs or trios, **sometimes more flowers at the lowest flowering node in *Capsicum***), with only pedicels, the peduncles absent or obsolete [Fig. 909]

Insert a new couplet 10 in above the existing couplet 10.

**10a.** Berries with hollow locules, the fruit usually elongated, but +/- globose in some cultivars; leaf blades entire ..... ***Capsicum***

**10b.** Berries with fleshy locules, the fruits +/- globose; leaf blades toothed to entire

 *Solanum capsicoides* All. (cockroach nightshade, Solanaceae) has been collected in eastern MA. Its inclusion in the key to the species of *Solanum* requires the following edits to be made (note bolded text and changed order of first two statements in couplet 1).

**1a.** Stems and/or leaf blades armed with slender prickles; leaf blades pubescent with compound hairs (**the hairs usually simple in *S. capsicoides***); anthers tapering to the apex (usually not tapering in *S. melongena*)

**1b.** Stems and leaf blades unarmed; leaf blades glabrous or pubescent with simple hairs (sometimes with a few stellate hairs in *S. pseudocapsicum*); anthers not tapering to the apex

A new couplet 2 needs to be inserted immediately beneath 1a.

**2a.** Corollas both white and with long lobes separated by sinuses that extend ca.  $\frac{3}{4}$  of the way to the base; berry orange to orange-red, 20–35 mm long at maturity, with winged seeds 4–6 mm long ..... ***S. capsicoides***

**2b.** Corollas not both white and with deep sinuses separating the lobes, ranging in color from yellow, blue, light purple to purple, or sometimes white in *S. carolinense*, with relatively short lobes in most species, the sinuses extending ca.  $\frac{1}{2}$  or less of the way to the base (with deeper sinuses in *S. citrullifolium*); berry various colors, but not orange to orange-red in most species, 8.5–20 mm long at maturity (or longer in *S. melongena*), with unwinged seeds 1.7–3.9 mm long

 *Tamarix ramosissima* Ledeb. (branched tamarisk, Tamaricaceae) has been collected in southwestern CT. Likewise, *T. chinensis* (five-stamened tamarisk) has also been collected in southwestern CT. This necessitates a key to the species of *Tamarix* being created.

**1a.** Racemes 5–10 mm wide; sepals entire; some or all of the stamens originating from below the nectar disk ..... ***T. chinensis***

**1b.** Racemes 3–5 mm wide; sepals denticulate; all of the stamens originating from the edge of the nectar disk

**2a.** Flowers 4-merous; filaments of stamens confluent with the lobes of the nectar disk ..... ***T. parviflora***

**2b.** Flowers 5-merous; filaments of stamens alternating with the lobes of the nectar disk ..... ***T. ramosissima***

 The name *Malva rotundifolia* L. (common mallow, Malvaceae) has been rejected due to the fact the original publication was based on a collection containing more than one species (Turland 1996; this proposal was accepted). *Malva pusilla* Sm. is now the appropriate name for this plant.

Turland, N. 1996. Proposal to reject the name *Malva rotundifolia* (Malvaceae). Taxon 45: 707–708.

➤ *Lipocarpa micrantha* (small-flowered flatsedge, Cyperaceae) is now referred to as *Cyperus subsquarrosus* (Muhl.) Bauters, based on the phylogenetic work of Bauters et al. (2014).

Bauters, K., I. Larridon, M. Reynders, P. Asselman, A. Vrijdaghs, A.M. Muasya, D.A. Simpson, and P. Goetghebeur. 2014. A new classification for *Lipocarpa* and *Volkiella* as infrageneric taxa of *Cyperus* s.l. (Cypereae, Cyperoideae, Cyperaceae): insights from species tree reconstruction supplemented with morphological and floral developmental data. Phytotaxa 166: 1–32.

➤ *Kyllinga gracillima* (pasture flatsedge, Cyperaceae) is now called *Cyperus brevifolioides* Thieret & Delahoussaye, based on research presented by Larridon et al. (2014).

Larridon, I., K. Bauters, M. Reynders, W. Huygh, and P. Goeghebeur. 2014. Taxonomic changes in C<sub>4</sub> *Cyperus* (Cypereae, Cyperoideae, Cyperaceae): combining the sedge genera *Ascolepis*, *Kyllinga* and *Pycneus* into *Cyperus* s.l. Phytotaxa 166: 33–48.

➤ The annual species of *Schoenoplectus* (Cyperaceae) with cespitose stems are now placed in the genus *Schoenoplectiella*. Evidence for this transfer can be found in Shiels et al. (2014) and the new combinations were made in Shiels and Monfils (2012). The following names will be used for our New England taxa:

*Schoenoplectiella purshiana* (Fern.) Lye var. *purshiana*  
*Schoenoplectiella purshiana* (Fern.) Lye var. *williamsii* (Fern.) Shiels & Monfils  
*Schoenoplectiella smithii* (Gray) Shiels & Monfils var. *leviseta* (Fassett) Shiels & Monfils  
*Schoenoplectiella smithii* (Gray) Shiels & Monfils var. *setosa* (Fern.) Shiels & Monfils  
*Schoenoplectiella smithii* (Gray) Shiels & Monfils var. *smithii*

Shiels, D.R., and A.K. Monfils. 2012. New combinations in North American *Schoenoplectiella* (Cyperaceae). Novon 22: 87–90.

Shiels, D.R., D.L. Hurlbut, S.K. Lichtenwald, and A.K. Monfils. 2014. Monophyly and Phylogeny of *Schoenoplectus* and *Schoenoplectiella* (Cyperaceae): Evidence from Chloroplast and Nuclear DNA Sequences. Systematic Botany 39: 132–144.

➤ *Anthriscus caucalis* (burr chervil, Apiceae) has been collected in Middlesex County, MA (specimen at housed at NEBC). The following new couplet 1 is needed in the existing *Anthriscus* key to the species to separate this addition to the flora of New England.

**1a.** Petals 0.5–0.85(–1) mm long; styles minute, ca. 0.1 mm long, erect or curved inward; schizocarp 2.9–3.8 mm long, usually covered with uncinat hairs ..... *A. caucalis*  
**1b.** Petals 1.2–3.1(–3.6) mm long; styles longer, 0.5–0.8 mm long, erect or curved outward; schizocarp (6–)7–10 mm long, glabrous (sometimes with some short hairs near the very base in *Anthriscus sylvestris*)

Because *A. caucalis* has hairs on the ovary, it also requires that the genus *Anthriscus* be keyed separately in the key to the genera of the Apiaceae. A new couplet 19 is needed and note bolded text in 18a.

**18a.** Ultimate segments of leaf blades narrower than 10 mm; ovary and fruit with **either** stiff, thin, ascending to spreading prickles [Fig. 358] **or uncinata hairs**

**19a.** Schizocarps with spines, these straight or merely curved, but not hooked at the tip; stems definitely pubescent with retrorsely oriented hairs; flower with small but evident sepals

..... ***Torilis***

**19b.** Schizocarps with hairs with are hooked near the apex; stems glabrous to sparsely pubescent with spreading to appressed hairs; flowers lacking sepals ..... (in part) ***Anthriscus***

**18b.** Ultimate segments of leaf blades wider than 10 mm; ovary and fruit with appressed-ascending bristles **or very short, slender hairs, neither of these not conspicuously hooked at the apex** [Figs. 352, 353]

 *Cynoglottis barrelieri* (All.) Vural & Kit Tan (false alkanet, Boraginaceae) has been collected from Fairfield County, CT (specimen at CONN). To incorporate this genus into the existing key to the species of Boraginaceae, the following couplet is needed:

**21a.** Limb of the corolla 5–20 mm wide; mericarps attached to the receptacle by a stipe-like process, this fitting into a pit in the receptacle

**22a.** Basal, connate, tubular portion of corolla 6–10 mm long, nearly equaling to longer than the limb; calyx 5–8(–10) mm long in flower, up to 18 mm long in fruit, the lobes acute at the apex ..... (in part) ***Anchusa***

**22b.** Basal, connate, tubular portion of corolla 1–1.5 mm long, much shorter than the limb; calyx 2–3 mm long in flower, up to 6 mm long in fruit, the lobes rounded to obtuse at the apex ..... ***Cynoglottis***

 The genus *Chenopodium* (Amaranthaceae) has been dismantled based on the phylogenetic work of Fuentes-Bazan et al. (2012). The following key can be used to identify *Chenopodium s.s.* and the genera formerly placed in *Chenopodium*. It would be placed under stanza 11b. of the existing key to the genera of the Amaranthaceae.

**17a.** Plants with stipitate glands or sessile glands ..... (in part) ***Dysphania***

**17b.** Plants glabrous or farinose, but not glandular

**18a.** Fruits arranged vertically or both vertically and horizontally in the calyx; calyx with 1–5 sepals

**19a.** Fruits both vertically and horizontally oriented ..... (in part) ***Oxybasis***

**19b.** Fruits only vertically oriented ..... ***Blitum***

**18b.** Fruits arranged horizontally in the calyx; calyx with 5 sepals

**20a.** Sepals keeled on the abaxial surface, not conforming to the fruit, the calyx appearing pentagonal or star-shaped [Fig. 328]; stems, leaf blades, and sepals moderately to densely farinose (foliage sometimes +/- glabrous in forms of *C. album*) ..... (in part) ***Chenopodium***

**20b.** Sepals flat or with an inconspicuous keel on the abaxial surface, at maturity conforming to the outline of the fruit and the outline of the calyx appearing +/- circular (except where individual sepals spread or reflex away from fruit) [Fig. 334]; stems, leaf

blades, and sepals usually glabrous and green (plants sometimes sparsely farinose on some surfaces, especially when young)

- 21a.** Leaf blades entire, or rarely with a single tooth on each margin; stems quadrangular; sepals apiculate at the apex ..... *Lipandra*
- 21b.** At least the lower leaf blades with prominent teeth; stems terete to angled, but not quadrangular; sepals retuse or obtuse to acute at the apex, without an apiculus
- 22a.** Pericarp evidently separating from mature seed [Fig. 332]; leaf blades lanceolate to oblong-ovate, entire or with short, ascending teeth ..... (in part) *Chenopodium*
- 22b.** Pericarp firmly attached to weakly separating from mature seed; leaf blades ovate or rhombic-ovate to triangular, sinuate-dentate to coarsely dentate
- 23a.** Achenes 1–1.2 mm wide ..... (in part) *Oxybasis*
- 23b.** Achenes 1.2–2.5 mm wide ..... *Chenopodiastrum*

The following new names will be used for New England taxa (other names in this complex remain as published in *Flora Novae Angliae*):

- Blitum bonus-henricus* (L.) Rchb. (perennial orache-goosefoot)
- Blitum capitatum* L. ssp. *capitatum* (strawberry orache-goosefoot)
- Blitum nuttallianum* J.A. Schultes (Nuttall’s orache-goosefoot)
- Blitum virgatum* L. ssp. *virgatum* (leafy orache-goosefoot)
- Chenopodiastrum murale* (L.) S. Fuentes, Uotila, & Borsch (nettle-leaved false goosefoot)
- Chenopodiastrum simplex* (Torr.) S. Fuentes, Uotila, & Borsch (large-seeded false goosefoot)
- Lipandra polysperma* (L.) S. Fuentes, Uotila, & Borsch var. *acutifolia* (Sm.) Mosyakin (manyseed-goosefoot)
- Lipandra polysperma* (L.) S. Fuentes, Uotila, & Borsch var. *polysperma* (manyseed-goosefoot)
- Oxybasis glauca* (L.) S. Fuentes, Uotila & Borsch ssp. *glauca* (oak-leaved Eurasian-goosefoot)
- Oxybasis rubra* (L.) S. Fuentes, Uotila & Borsch var. *humilis* (Hook.) Mosyakin (red Eurasian-goosefoot)
- Oxybasis rubra* (L.) S. Fuentes, Uotila & Borsch var. *rubra* (red Eurasian-goosefoot)
- Oxybasis urbica* (L.) S. Fuentes, Uotila & Borsch (city Eurasian-goosefoot)

Fuentes-Bazan, S., G. Mansion, and T. Borsch. 2011. Towards a species level tree of the globally diverse genus *Chenopodium* (Chenopodiaceae). *Molecular Phylogenetics and Evolution* 62: 359–374.

 *Elatine ambigua* (Asian waterwort, Elatinaceae), a non-native species, has been documented for New England based on the work of Rosman et al. (2016). It is known from CT and MA. This species would key to *E. triandra* in the flora, but can be distinguished as follows:

- a.** pedicel absent or very short, up to 0.4 mm long (i.e., the flowers sessile or nearly so), not downward curved in the fruit so that the capsule closely in the leaf axil ..... *E. triandra*
- b.** pedicel 1.5–2.5 mm long (i.e., the flowers clearly stalked), downward curved in fruit so that the capsule is positioned away from the leaf axil ..... *E. ambigua*

➤ *Rosa virginiana* (Virginia rose, Rosaceae) has been subdivided into two subspecies by Lewis (2016), both of which occur in New England. They are separated as follows:

**1a.** Lower portion of stems and branches densely beset with slender, acicular internodal prickles and usually also stipitate glands; leaf blades with relatively smaller teeth [refine]

..... ***R. v. subsp. minidentata* W.H. Lewis**

**1b.** Lower portion of stem and branches with few to no slender, acicular intermodal prickles and lacking stipitate-glands; leaf blades with relatively larger teeth [refine] ... ***R. v. subsp. virginiana***

*Rosa virginiana* subsp. *minidentata* is known from MA, NH, VT. With the exception of a Dukes County, MA, collection, preliminary information suggests this species is mainly found in western New England.

Lewis, W.H. 2016. Nomenclatural Novelties in *Rosa* (Rosaceae) subgenus *Rosa* Recognized in North America. *Novon* 25: 22–46.

➤ Lewis (2016) published a number of new *Rosa* hybrids (Rosaceae), of which seven occur in New England. Their names, parentage, and known distribution follows.

*Rosa* × *churchillii* W.H. Lewis (*Rosa blanda* × *R. nitida*) MA, ME, VT.

*Rosa* × *fernaldiorum* W.H. Lewis (*Rosa carolina* × *R. nitida*) ME.

*Rosa* × *gilmaniana* W.H. Lewis (*Rosa blanda* × *R. carolina*) MA, ME, NH, VT.

*Rosa* × *hainesii* W.H. Lewis (*Rosa blanda* × *R. virginiana*) MA, ME, NH.

*Rosa* × *hodgdoniana* W.H. Lewis (*Rosa nitida* × *R. virginiana*) MA, ME, NH.

*Rosa* × *massiana* W.H. Lewis (*Rosa carolina* × *R. rugosa*) MA.

*Rosa* × *per-axeliana* W.H. Lewis (*Rosa acicularis* × *R. blanda*) MA, ME, NH, VT.

Lewis, W.H. 2016. Nomenclatural Novelties in *Rosa* (Rosaceae) subgenus *Rosa* Recognized in North America. *Novon* 25: 22–46.

➤ Species of *Orobanche* (Orobanchaceae) found in the New World (including New England) are now segregated as a separate genus named *Aphyllon* based on the work of Schneider (2016). Therefore, the plant formerly called *Orobanche uniflora* is now called *Aphyllon uniflorum* (L.) Torr. & Gray. (one-flowered cancer-root). Our other species of *Orobanche*, *O. minor* (lesser broom-rape), remains in that genus.

Schneider, A.C. 2016. Resurrection of the genus *Aphyllon* for New World broomrapes (*Orobanche s.l.*, Orobanchaceae). *Phytokeys* 75: 107–118.

➤ The Parnassiaceae has been included within the family Celastraceae based on the work of Simmons et al. (2001). Therefore, *Parnassia glauca* (fen grass-of-Parnassus) is now treated as belonging to the bittersweet family.

Simmons, M.P., V. Savolainen, C.C. Clevinger, R.H. Archer, and J.I. Davis. Phylogeny of the Celastraceae inferred from 26S nuclear ribosomal DNA, phytochrome B, *rbcl*, *atpB*, and morphology. *Molecular Phylogenetics and Evolution* 19: 353–366.

 The genus *Iris* (Iridaceae) has been dismantled, with five genera occurring within New England. This is based on work by Crespo et al. (2015) and research summarized within that article. The key to the genera is as follows:

- 1a. Styles narrow, not petaloid, without crests; anthers visible, not appressed to style branches; seeds black, fully exposed at maturity ..... *Belamcanda*
- 1b. Styles broad, petaloid, with paired crests at the apex; anthers concealed, appressed to abaxial surface of style branches; seeds ultimately tan to brown, contained within the capsule
  - 2a. Plants actually or nearly acaulescent at anthesis, the stems up to 4.5 cm tall
    - 3a. Sepals with a line of multicellular hairs on the midrib; stems absent or up to 1 cm tall; capsules rounded-triangular in cross-section ..... (in part) *Iris*
    - 3b. Sepals with 3, parallel, toothed ridges; stems 2.5–4.5 cm tall; capsules sharply triangular in cross-section ..... *Lophiris*
  - 2b. Plants caulescent, the stems (5–) 10–120 cm tall
    - 4a. Sepals ornamented with toothed ridges; capsule 6-ribbed ..... *Tectiris*
    - 4b. Sepals without ridges or crests, though sometimes pubescent; capsule 3-ribbed or 3-edged
      - 5a. Sepals with a line of multicellular hairs on the midrib; seeds oval in outline ..... (in part) *Iris*
      - 5b. Sepals glabrous or with a small patch of fine, unicellular hairs near the base in ..... *Limniris*

The names and authorities of the species found within New England are:

- Belamcanda chinensis* (L.) DC. (blackberry-lily)
- Iris germanica* L. (German iris)
- Iris pumila* L. (dwarf iris)
- Limniris ensata* (Thunb.) Rodion. (Russian beardless-iris)
- Limniris hookeri* (Penny ex Loudon) M.B.Crespo, Mart.-Azorin & Mavrodiev (beach-head beardless-iris)
- Limniris prismatica* (Pursh) Rodion. (slender beardless-iris)
- Limniris pseudacorus* (L.) Fuss (yellow beardless-iris)
- Limniris sibirica* (L.) Fuss (Siberian beardless-iris)
- Limniris versicolor* (L.) Rodion. (blue beardless-iris)
- Lophiris cristata* (Sol. ex W.Aiton) M.B.Crespo, Mart.-Azorin & Mavrodiev (dwarf crested-iris)
- Tectiris tectorum* (Maxim.) M.B. Crespo, Mart.-Azorin & Mavrodiev (wall-iris)

Crespo, M.B., M. Martínez-Azorín, and E.V. Mavrodiev. 2015. Can a rainbow consist of a single colour? A new comprehensive generic arrangement of the ‘*Iris sensu latissimo*’ clade (Iridaceae), congruent with morphology and molecular data. *Phytotaxa* 232: 1–78.

 *Opuntia humifusa* (eastern prickly-pear, Cactaceae) has been shown to consist of multiple species worthy of distinction, based on the work of Majure et al. (2017). Within New

England, two species are known, *O. humifusa* s.s. and *Opuntia cespitosa* Raf (tufted prickly-pear). They can be distinguished as follows:

- 1a.** Cladodes (i.e., stem segments) strongly glaucous-green when developing; leaves glaucous, gray-green, 5.5–6.8 mm long, spines present, 1.5–4.3 cm long; berries 2.7–4.5 cm long, with seeds 4.9–5.4 mm long ..... *O. cespitosa*  
**1b.** Cladodes not glaucous; leaves dark green, 6.2–9.6 mm long; spines absent; berries 4.2–4.8 cm long, with seeds 3–3.5 mm long ..... *O. humifusa*

*Opuntia humifusa* is known from CT, MA, NH. *Opuntia cespitosa* is known from CT, MA.

Majure, L.C., W.S. Judd, P.S. Soltis, and D.E. Soltis. 2017. Taxonomic revision of the *Opuntia humifusa* complex (Opuntieae: Cactaceae) of the eastern United States. *Phytotaxa* 290: 1–65.

 *Lilium bulbiferum* L. (orange lily, Liliaceae) has been collected as a naturalized plant in eastern MA. It's inclusion in the identification key to the species of lily requires a new couplet 2 inserted under the existing couplet 1.

- 1a.** Leaves alternate throughout, with bulbils in the upper axils (without bulbils or with few bulbils in common forms of *L. bulbiferum*)  
**2a.** Flowers erect to ascending; tepals ascending to spreading-ascending (i.e., not recurved); axillary bulbils, when present, not dark (often light green); leaves 3.8–7(–15) cm long ..... *L. bulbiferum*  
**2b.** Flowers nodding; tepals recurved, forming a “Turk’s-cap” perianth; axillary bulbils dark; leaves 6.5–15(–18) cm long ..... *L. lancifolium*  
**1b.** Leaves mostly or all whorled, without axillary bulbils

 *Solidago brendiae* J.C. Semple (Brenda’s goldenrod, Asteraceae) is a newly described goldenrod endemic to northeastern North America. It has been found in ME and VT. It is part of the section *Triplenervae* and is incorporated into the existing species of that section below.

- 10a.** Stem glabrous and glaucous below the capitulescence ..... *S. gigantea*  
**10b.** Stem pubescent in at least the apical half, not glaucous  
**11a.** Involucral bracts minutely stipitate-glandular near apex and/or along margins (note: view at 30× or higher magnification); branches of capitulescence mostly ascending to spreading-ascending, straight to slightly arching along length; capitulescence often with scattered leafy bracts (i.e., the bracts relatively large and +/- resembling foliage leaves) ..... *S. brendiae*  
**11b.** Involucral bracts without stipitate-glands; branches of capitulescence ascending to spreading, usually the branches arching along length and appearing outcurved to recurved; capitulescence usually without or with few leafy bracts (except sometimes at very base; i.e., the bracts evidently reduced in size from the foliage leaves)  
**12a.** Leaf blades abaxially subglabrous or pubescent only on the midrib and major veins (also pubescent between the veins in var. *hargerii*), usually sharply serrate and relatively thin; involucre 2–3 mm tall; disk corollas 2.3–2.7 mm long

- ..... *S. canadensis*  
**12b.** Leaf blades abaxially pubescent on and between major veins, usually  
subentire to remotely serrate and relatively firm; involucre (2.7–) 3–4 (–5) mm tall;  
disk corollas 3–3.4 mm long ..... *S. altissima*

*Solidago brendiae* most closely resembles *S. canadensis*. In addition to the characteristics used in the identification key, they can also be separated by ray flower number and upper leaf blade length. *Solidago canadensis* has (5–)6–12 ray flowers per capitulum and upper leaves mostly 15–80 mm long, while *S. brendiae* has (7–)10–16(–21) ray flowers and upper leaves mostly 45–120 mm long.

 *Nuttallanthus canadensis* (Plantaginaceae) has been shown in multiple phylogenetic analyses (e.g., Fernández-Mazuecos et al. 2013, Yousefi et al. 2017) to be nested within the genus *Linaria*. Therefore, *Linaria canadensis* (L.) Chaz. is the correct name for this plant.

Fernández-Mazuecos, M., J.L. Blanco-Pastor, and P. Vargas. Phylogeny of toadflaxes (*Linaria* Mill.) based on nuclear internal transcribed spacer sequences: systematic and evolutionary consequences. *International Journal of Plant Sciences* 174: 234–249.

Yousefi, N., G. Heubl, and S. Zarre. 2017. Subgeneric classification of *Linaria* (Plantaginaceae; *Antirrhineae*): molecular phylogeny and morphology revisited. *Progress in Biological Sciences* 7: 53–65.

 *Packera anonyma* (Wood) A. & D. Löve (Small’s groundsel, Asteraceae) has been collected in western CT. This native species is included in the flora by adding a new couplet 1 to the existing key to the species of *Packera*.

- 1a.** Cypselas 0.75–1 mm long; disk flowers with the narrow, basal, connate tube 1.5–2 mm long and the expanded limb (including the lobes) 1.5–2(–2.5) mm long; pappus 2.5–3(–4) mm long; distal portion of peduncles usually tomentose ..... *P. anonyma*  
**1b.** Cypselas 1–2 mm long; disk flowers with the narrow, basal connate tube 2–4 mm long and the expanded limb 2–3.5 mm long; pappus 3–5.5 mm long; distal portion of peduncles glabrous to sparsely tomentose

 Some records of *Verbena bonariensis* (purple-topped vervain, Verbenaceae) are actually referable to *Verbena incompta* P.W. Michael (common clasping vervain). They two species can be distinguished by the following identification key:

- 7a.** Corolla 0–0.5 mm longer than associated calyx (i.e., only slightly exerted from the calyx), the connate, tubular portion 2.5–4 mm long; peduncles and calyces pubescent with eglandular hairs; floral bracts 3–4 mm long, longer than associated calyx; mericarps 1–1.2(–1.4) mm long; basal and midstem leaf blades broad-lanceolate or oblong-elliptic to ovate or obovate, 10–35 mm wide ..... *V. incompta*  
**7b.** Corolla 1.5–2 mm longer than associated calyx (i.e., prominently exerted from the calyx), the connate, tubular portion 4–6(–7) mm long; peduncles and calyces pubescent with stipitate glands; floral bracts 2.1–2.8 mm long, shorter than associated calyx;

**mericarps 1.5–1.9 mm long; basal and midstem leaf blades oblong-lanceolate to oblong-ob lanceolate, 10–20 mm wide ..... *V. bonariensis***

Both species of vervain are known from MA.

➤ *Scirpus pallidus* (pale bulrush, Cyperaceae) has been documented from ME. It's inclusion in the existing key requires the addition of a new couplet (couplet 7 below):

**6a.** Perianth bristles numbering 0–3 per flower, up to 0.7 times as long as the achene, smooth or with barbs only near the very apex ..... *S. georgianus*

**6b.** Perianth bristles numbering mostly 5 or 6 per flower, more than 0.6 times as long as the achene, barbed in the apical half

**7a.** Floral scales 1.6–2.8 mm long, the apex with a terete or flat awn 0.5–0.6(–1.2) mm long ..... *S. pallidus*

**7b.** Floral scales 1–2.1 mm long, the apex with a mucro 0.1–0.3(–0.4) mm long

**8a.** Longer perianth bristles shorter than to equaling the length of the 0.8–1.1-mm-long achenes; floral scales appearing black under low magnification; spikelets 2–3.5 mm long; leaf blades 5–9 (–10) mm wide; basal leaves and sheaths usually with few and inconspicuous cross-septa ..... *S. hattorianus*

**8b.** Longer perianth bristles exceeding the length of the 1–1.3-mm-long achenes; floral scales appearing brown under low magnification; spikelets mostly 3.5–5 mm long; leaf blades 7–17 (–18) mm wide; basal leaves and sheaths with many prominent cross-septa ..... *S. atrovirens*

➤ *Juncus trifidus* (highland rush, Juncaceae) has been transferred to a new genus named *Oreojuncus* (highland-rush) based on the research of Drábková and Kirschner (2013). It is now referred to as *Oreojuncus trifidus* (L.) Závěská Drábková & Kirschner.

Drábková, L.Z., and J. Kirschner. 2013. *Oreojuncus*, a new genus in the Juncaceae. *Preslia* 85: 483–503.

➤ *Potamogeton ×hagstroemii* Benn. (*P. gramineus* × *P. richardsonii*, Potamogetonaceae) has been collected in ME (specimen at MASS) and VT (specimen at PRA). This hybrid has submersed leaves mostly 4–7.7 cm long with 5–9 veins. The hybrid differs from *P. gramineus* by its leaf blades that are convexly tapered to the base (rather than a long, straight taper to a narrow base). It differs from *P. richardsonii* in the +/- sessile leaves that are not cordate-clasping and submersed leaves with fewer veins.

➤ The correct name for the hybrid of *Potamogeton amplifolius* × *P. illinoensis* (Potamogetonaceae) is *P. ×luxurians* Z. Kaplan because the previously used name for this hybrid (*P. ×scoliophyllus*) is based on a collection of *P. illinoensis* (i.e., the type of *P. ×scoliophyllus* was not the hybrid it was believed to be).

➤ The varieties of *Solidago simplex* Kunth (Asteraceae) are better recognized at the rank of species, based on the work of Pierson et al. (2012). Our two taxa in this complex would then be called:

*Solidago racemosa* Greene (riverbank goldenrod)  
*Solidago randii* (Porter) Britt. (Rand's goldenrod)

Peirson, J.A., A.A. Reznicek, and J.C. Semple. 2012. Polyploidy, infraspecific cytotype variation, and speciation in Goldenrods: The cytogeography of *Solidago* subsect. *Humiles* (Asteraceae) in North America. *Taxon* 61: 197–210.

➤ *Juncus biflorus* Ell. (large grass-leaved rush, Juncaceae) needs to be recognized as distinct based on the work of Knapp and Naczi (2008). The following identification key will distinguish *J. biflorus* from *J. marginatus*.

- 1a.** Anthers (0.2–)0.3–0.5(–0.7) mm long, concealed by the tepals; sheath of lowest leaf (1.7–)2.2–3.8(–4.7) cm long; widest leaf blades (1.3–)1.6–2.6(–3.5) mm wide; stems (0.4–)2–4.4(–6) mm thick at the base, the tallest ones (19.2–)26–44(–56.8) cm tall ..... ***J. marginatus***
- 1b.** Anthers (0.5–)0.6–1(–1.3) mm long, exerted beyond the tepals; sheath of lowest leaf (3.2–)4.3–7.8(–9.7) cm long; widest leaf blades (2.6–)3.1–4.5(–5.4) mm wide; stems (3.4–)5.8–9.6(–12) mm thick at the base, the tallest ones (27.2–)50.8–81.2(–100.7) cm tall ..... ***J. biflorus***

Knapp, W.M., and R.F.C. Naczi. 2008. Taxonomy, morphology, and geographic distribution of *Juncus longii* (Juncaceae). *Systematic Botany* 33: 685–694.

➤ *Stuckenia ×fennica* (Hagstr.) Holub (*Stuckenia filiformis* × *S. vaginata*, Potamogetonaceae) is documented from ME and VT. This false pondweed hybrid is responsible for reports of *Stuckenia filiformis* subsp. *occidentalis* in New England. These are the more robust, broader-leaved, riverine populations of *Stuckenia* that lack well-developed fruits. *Stuckenia ×fennica* in New England is typically 20–100 cm long, with leaf blades mostly 0.5–2 mm wide, and has stipules on the proximal portion of the stem loose and inflated, 0.2–5 mm wide, disintegrating in age (whereas *S. filiformis* in New England is typically 10–30 cm long, with leaf blades mostly 0.2–0.8 mm wide, and has stipules on the proximal portion of the stem tightly clasping, 0.2–1 mm wide, persisting in age).

➤ The genus *Minuartia* (Caryophyllaceae) has been subdivided based on the phylogenetic research of Dillenberger and Kadereit (2014). As a result, three new genera are recognized in New England: *Cherleria*, *Mononeuria*, and *Sabulina*. The following names are to be used with our taxa:

*Cherleria marcescens* (Fern.) A.J. Moore & Dillenb. (serpentine alpine-starwort)  
*Mononeuria caroliniana* (Walt.) Dillenb. & Rabeler (  
*Mononeuria glabra* (Michx.) Dillenb. & Kadereit  
*Mononeuria groenlandica* (Retz.) Dillenb. & Kadereit  
*Sabulina michauxii* (Fenzl) Dillenb. & Kadereit  
*Sabulina rubella* (Wahlenb.) Dillenb. & Kadereit

A key to the genera is also presented.

- 1a. Sepals nerveless or obscurely nerved ..... *Mononeuria*  
 1b. Sepals with 3 or 5 strong, longitudinal ribs  
   2a. Sepals herbaceous, rounded at apex [Fig. 564]; lower portion of branches densely clothed by coriaceous, marcescent leaves; capsules 6–10 mm long, with valves that are emarginate at the apex ..... *Cherleria*  
   2b. Sepals rigid, acute at apex; leaves deciduous or marcescent, but not densely clothing the lower portion of branches; capsules 3–5 mm long, with valves that are entire at apex ..... *Sabulina*

Dillenberger, M.S., and J.W. Kadereit. 2014. Maximum polyphyly: Multiple origins and delimitation with plesiomorphic characters require a new circumscription of *Minuartia* (Caryophyllaceae). *Taxon* 63: 64–88.

➤ *Saxifraga paniculata* P. Mill. ssp. *neogaea* (Butters) D. Löve (white mountain saxifrage, Saxifragaceae) has been shown not to be distinct from the European ssp. *paniculata*, based on the work of Reisch (2008) and others. Therefore, our New England material of this species should be treated as ssp. *paniculata* (to distinguish it from ssp. *cartilaginea* (Willd. ex Sternb.) D.A. Webb of the Caucasus and ssp. *laestadii* (Neuman) Karlsson of arctic North America and Europe).

Reisch, C. 2008. Glacial history of *Saxifraga paniculata* (Saxifragaceae): molecular biogeography of a disjunct arctic-alpine species from Europe and North America. *Botanical Journal of the Linnean Society* 93: 385–398.

➤ Our fern called *Cheilanthes lanosa* (hair lip fern, Pteridaceae) has been placed in the segregate genus *Myriopteris*. It is now properly called *M. lanosa* (Michx.) Grusz & Windham based on the research of Grusz and Windham (2013). This change was necessary to maintain a monophyletic *Cheilanthes*.

Grusz, A.L., and M.D. Windham. 2013. Toward a monophyletic *Cheilanthes*: The resurrection and recircumscription of *Myriopteris* (Pteridaceae). *Phytokeys* 32: 49–64.

➤ The two subspecies of *Asplenium trichomanes* found in New England have been shown to be better treated as species given they have distinct morphologies, differ in ploidy level, produce abortive-spored hybrids, and the “*quadrivalens*” plants have half of a genome not derived from *A. trichomanes* (Howard 1994). Therefore, the tetraploid plants that typically occur on high-pH substrate are better referred to as *A. quadrivalens* (D.E. Mey.) Landolt. (common maidenhair spleenwort). *Asplenium trichomanes* (delicate maidenhair spleenwort) is then treated as a distinct species primarily of acidic substrate. The hybrid between these two species is called *Asplenium* × *lusaticum* D.E. Mey.

Howard, B.A., C.A. Paris, and D.S. Barrington. 1994. Electrophoretic evidence for allopolyploidy in the *Asplenium trichomanes* complex in eastern North America. *American Journal of Botany* 81: 130.

 *Chamerion angustifolium* (narrow-leaved fireweed, Onagraceae) is correctly placed in the genus *Chamaenerion*, and should be called *Chamaenerion angustifolium* (L.) Scop. ssp. *circumvagum* (Mosquin) Moldenke, as discussed in Sennikov (2011).

Sennikov, A.N. 2011. *Chamerion* or *Chamaenerion* (Onagraceae)? The old story in new words. *Taxon* 60: 1485–1488.

